INTERNATIONAL CONFERENCE ON EDUCATION AND NEW DEVELOPMENTS

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BOOK OF ABSTRACTS

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BRIEF CONTENTS

FOREWORD

Dear Colleagues,

We are delighted to welcome you to the International Conference on Education and New Developments 2026 - END 2026, held in Madeira Island, Portugal, from 20 to 22 of June 2026.

Education is a fundamental right that accompanies us from the very beginning of our lives. It encompasses every experience we encounter, influencing and shaping our thoughts, emotions, and actions. Whether we engage in formal education within classrooms or learn from the world around us, the process of acquiring knowledge plays a vital role in our personal growth and development. It equips us with the tools to navigate the complexities of life, broadens our perspectives, and empowers us to make informed decisions. This International Conference seeks to provide some answers and explore the processes, actions, challenges and outcomes of learning, teaching and human development. Our goal is to offer a worldwide connection between teachers, students, researchers and lecturers, from a wide range of academic fields, interested in exploring and giving their contribution in educational issues.

We are delighted to have successfully facilitated connections among academics, scholars, practitioners, and individuals who share a common interest in a field abundant with fresh perspectives, ideas, and knowledge. Our event has attracted a diverse range of contributors and presenters, enriching our understanding of human nature and behavior by showcasing the influence of their unique personal, academic, and cultural backgrounds. This diversity is a testament to the international reach of our conference, fostering multi-disciplinary collaborations and fostering intellectual growth and exchange.

END 2026 received 883 submissions, from more than 48 different countries, reviewed by a double-blind process. Submissions were prepared to take form of Oral Presentations, Posters, Virtual Presentations and Workshops. For presentation, the conference accepted 344 submissions (39% acceptance rate).

The conference also includes one Keynote presentation by Prof. Pedro Isaias, Universidade Aberta (Portuguese Open University), Portugal. We would like to express our gratitude to our invitee.

This volume is composed by the abstracts of the International Conference on Education and New Developments (END 2026), organized by the World Institute for Advanced Research and Science (W.I.A.R.S.). This conference addressed different categories inside the Education area and papers are expected to fit broadly into one of the named themes and sub-themes. To develop the conference program, we have chosen four main broad-ranging categories, which also covers different interest areas:

• In **TEACHERS AND STUDENTS**: Teachers and Staff training and education; Educational quality and standards; *Curriculum* and Pedagogy; Vocational education and Counselling; Ubiquitous and lifelong learning; Training programs and professional guidance; Teaching and learning relationship; Student affairs (learning, experiences and diversity; Extra-curricular activities; Assessment and measurements in Education.

• In **PROJECTS AND TRENDS**: Pedagogic innovations; Challenges and transformations in Education; Technology in teaching and learning; Distance Education and eLearning; Global and sustainable developments for Education; New learning and teaching models; Multicultural and (inter)cultural communications; Inclusive and Special Education; Rural and indigenous Education; Educational projects.

• In **TEACHING AND LEARNING**: Critical, Thinking; Educational foundations; Research and development methodologies; Early childhood and Primary Education; Secondary Education; Higher Education; Science and technology Education; Literacy, languages and Linguistics (TESL/TEFL); Health Education; Religious Education; Sports Education.

• In **ORGANIZATIONAL ISSUES**: Educational policy and leadership; Human Resources development; Educational environment; Business, Administration, and Management in Education; Economics in Education; Institutional accreditations and rankings; International Education and Exchange programs; Equity, social justice and social change; Ethics and values; Organizational learning and change, Corporate Education.

The abstracts of this book comprise the outcomes of research and development efforts undertaken by authors who have dedicated themselves to advancing research methods intertwined with teaching, learning, and practical applications in today's educational landscape. These abstracts showcase the different variety of contributors and presenters who will expand our understanding of educational matters by sharing their unique personal, academic, and cultural perspectives. Through their valuable insights and experiences, they enrich our exploration and contribute to the growth of educational discourse in our contemporary world.

We would like to express thanks to all the authors and participants, the members of the academic scientific committee, and of course, to our organizing and administration team for making and putting this conference together.

Hoping to continue the collaboration in the future.

Respectfully,

Mafalda Carmo
World Institute for Advanced Research and Science (WIARS), Portugal
Conference and Program Chair

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KEYNOTE LECTURE

"AI AND THE DIGITAL TRANSFORMATION OF HIGHER EDUCATION ASSESSMENT"

Prof. Pedro Isaias
Universidade Aberta (Portuguese Open University), Portugal

Abstract

Artificial Intelligence (AI) is increasingly influencing how assessment is designed, delivered and interpreted in higher education. Its use extends beyond the automation of grading to areas such as formative assessment, personalised feedback, adaptive learning, learning analytics, academic integrity and student support. At the same time, the growing integration of AI into assessment raises important questions concerning transparency, accountability, privacy, bias, academic judgement and the credibility of evidence of student learning.

This keynote examines the adoption and non-adoption of AI-enabled assessment in higher education through a comparative study conducted in 2024 and 2026. It explores how university teachers' perceptions, practices and intentions regarding AI-supported assessment have evolved during a period of rapid technological and institutional change. Particular attention is given to the purposes for which AI is being used, the perceived benefits and barriers associated with its adoption, and the factors that continue to influence lecturers' willingness to incorporate AI into assessment practices.

The keynote also examines the distinctive capabilities of key categories of AI-enabled assessment technologies, illustrated through representative tools such as adaptive learning platforms, automated grading systems, intelligent tutoring systems, plagiarism-detection tools, learning analytics platforms, learning management systems and secure digital assessment environments.

The presentation concludes by addressing the institutional policies, professional development, transparency mechanisms and forms of human oversight required for responsible adoption. It invites participants to reflect on how higher education can redesign assessment while preserving academic integrity, teacher–student relationships and trust in qualifications in an environment where human and artificial intelligence increasingly interact.

Keywords: *Artificial Intelligence, higher education, assessment, Generative AI, academic integrity, digital transformation, teacher perceptions, educational innovation.*

Biography

Pedro Isaías is an associate professor with Habilitation at Universidade Aberta (Portuguese Open University) in Lisbon, Portugal. Previously, Pedro was an associate professor at the Information Systems & Technology Management School of The University of New South Wales (UNSW – Sydney), Australia, an associate professor at The University of Queensland, Brisbane, Australia, and an invited professor at ISEG-University of Lisbon, Portugal. At Universidade Aberta, he is currently responsible for several courses in the Information Systems areas and also a member of the coordination team of the postgraduation in Digital Innovation and Business Analytics. At Universidade Aberta, Pedro was director of the master degree program in Management / MBA and also director of the master degree program in Electronic Commerce and Internet for 10 years. He is co-founder and president of IADIS – International Association for Development of the Information Society, a scientific non-profit association. Author of several books, book chapters, papers and research reports, all in the information systems area, he has headed several conferences and workshops within the mentioned area. He has also been responsible for the scientific coordination of several EU funded research projects and has had participation as a principal investigator in various research projects. Currently he conducts research activity related to MIS in general, and more specifically Learning Technologies, Data Analytics, Business Intelligence, Digital Transformation, e-Business and WWW related areas. Pedro has more than 198 publications: 34 journal papers, 76 conference papers, 11 authored books, 33 edited books, 24 book chapters, and 21 journal special issues. Pedro has delivered 35 keynote/invited talks & workshop panels and has received over 4.793 citations, resulting in an h-index of 35 (Google Scholar, February 2026).

INDEX OF CONTENTS

ORAL PRESENTATIONS

Teachers and Students

Projects and Trends

Organizational Issues

POSTERS

Teachers and Students

Projects and Trends

Teaching and Learning

VIRTUAL PRESENTATIONS

Teachers and Students

Projects and Trends

Teaching and Learning

Organizational Issues

WORKSHOPS

ORAL PRESENTATIONS

TEACHERS AND STUDENTS

ENHANCING UNIVERSITY TEACHING AND LEARNING THROUGH A PYTHON TRAINING COURSE FOR EDUCATORS AND STUDENTS

Manuel Gil-Martín, Sergio Esteban-Romero, Iván Martín-Fernández,
Juan Manuel Montero-Martínez, Rubén San-Segundo, & Fernando Fernández-Martínez
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Grupo de Innovación Docente en Ingeniería y Sistemas Electrónicos (GRIDS),
Departamento de Ingeniería Electrónica, Information Processing and Telecommunications Center,
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Abstract
Over the past few years, Python has emerged as one of the most versatile and widely used programming languages, ranging from data analysis to signal processing and artificial intelligence. Although gaining prominence in academia and industry, even today many university instructors are unaware about Python and lack official structured resources to learn such skills. To meet this requirement, we have designed a training course called "Introduction to the Python Programming Language" at the Institute of Educational Sciences of the Universidad Politécnica de Madrid. It is addressed both to lecturers and students and promotes digital literacy. The course offers elementary and advanced content, taking participants through simple constructs of programming, such as, variables, control structures, elementary data structures and data visualization using Matplotlib, to more advanced topics, such as, object-oriented programming, pandas-based data analysis, scientific computing with NumPy and SciPy, or symbolic computation with SymPy. An interesting feature of the course is use of interactive notebooks, completely executable in the Google Colab environment. This approach avoids installation limitations, provides flexibility between machines, and allows immediate experimentation, democratizing programming among instructors from different university faculties since only a web browser is required. The notebooks are designed as guided tutorials: aside from explaining the concepts, they include problem-solving exercises that prompt participants to experiment on their own and enhance their computational thinking skills. The course also incorporates educational innovation techniques such as problem-based learning, gamification, challenge-based learning, and active learning, which foster motivation, engagement, and deeper understanding through hands-on activities. Over several editions, the course has received growing interest, achieving full enrolment annually. Feedback from participants is consistently positive regarding the clarity, accessibility, and scope of the material, and the balance between theory and practical exercises. Participants particularly value the notebooks they can return to explanations while gradually moving towards increasingly challenging applications. The course success validates the relevance to offering specialized training in computer skills to the university community. The course aligns with generic training goals: it increases teaching quality by equipping teachers with tools to include computer programming in their lessons; enhances critical thinking and independence among students; and encourages lifelong learning within the academic community. The work presents the course design, implementation, and evaluation in the context of teacher training, curriculum development, and innovation in higher education. The results demonstrate how continuous professional development in programming can improve the teaching-learning experience and quality of education in a more digitalized society.

Keywords: *Higher education, teacher training, digital competencies, lifelong learning.*

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RETHINKING ALGEBRA LEARNING BASED ON A PSYCHOLOGICAL AND TRANSFORMATIVE LEARNING APPROACH

Natalia Karlsson[1], & Wiggo Kilborn[2]
[1]*Department of Pedagogy and Didactics, Södertörn University, Huddinge, Stockholm (Sweden)*
[2]*Faculty of Education, University of Gothenburg, Gothenburg (Sweden)*

Abstract
The objective of this study is to examine how psychological approaches, such as transformative learning, can contribute to rethinking students' algebra learning and enhancing algebra instruction in primary and secondary school settings. The study explores conceptual continuity in students' algebra learning, as well as the interplay between number concepts, with a focus on learning whole and rational numbers and algebraic methods. It also explores the conceptual relationship between numbers and their operations, particularly the shift from numerical reasoning to abstract algebraic content through the integration of intuitive inductive algebraic methods and algebraic inverse methods. To provide background for the teaching and learning of algebra, a theoretically grounded design for teaching and learning algebra was constructed, incorporating transformative learning (TL) into algebra learning content in the form of a Transformative Structured Learning (TSL) model. The TSL model is a theoretical conceptualization of how the learning process should engage, systematize, extend, and conceptually integrate students' prior knowledge (experience) into a new algebraic context. The benefit of the TSL model is that it illustrates how a conceptual transition from students' prior knowledge to algebraic content can be built and applied to other types of teaching–learning contexts, such as instrumental, dialogic-communicative, and self-reflective, focusing on arithmetic–algebra content. The algebraic methods in the TSL model function as mediators and conceptual transition tools that lead students to a deeper transformative understanding of algebraic sign rules and algebraic operations with numbers. The paper outlines a new, theoretically grounded approach to teaching and learning algebra based on a TL learning design, such as the TSL model, which is adjusted according to the subject-specific environment of individual classrooms. The study highlights the importance of developing alternative approaches to teaching and learning – focusing on the psychological nature of learning – thereby supporting students and their understanding of algebra.

Keywords: *Learning of algebra, transformative learning, conceptual continuity, whole and rational numbers, algebraic inverse concept, Freudenthal's inductive method.*

WHAT PROFESSIONAL MUSIC TRAINING DOES BETTER THAN AI — THE TUT EXPERIENCE

Hua Hui Tseng
Tainan University of Technology (Taiwan)

Abstract
The context for this paper is the Taiwan Ministry of Education's AI Pedagogical Content Knowledge (AIPACK) project to enhance the ability of teachers to incorporate artificial intelligence (AI) into the curriculum. It encourages the use of technology applications to develop comprehensive AI-related courses, facilitate partnerships between academia and industry, assess and update AI-related curricula, and give music educators an opportunity to reconfigure and strengthen their pedagogical methods. This paper contains observations and reflections from a case study of postgraduate students ($n = 7$) in the Music Department of the Tainan University of Technology (TUT), Taiwan. The study involved the use of AI in teaching music alongside professional training presented by teachers with specialized knowledge and technical skills. The author compared professional music training in the Research Methods and Thesis Writing class, which involves structured learning in performance through formal schools (universities) or online platforms (Coursera), with the use of *Claude* AI for the students' performance program notes writing. The students were asked to write program notes for a concert audience about their performance of Schumann's piano piece *Papillons*, Op. 2. The author evaluated the students' program notes and the response of the audience and found that on average, professional training produced better results that AI. The paper provides insights into the relationship between human and machine creativity, which is related to important questions about the future of creative work in the age of AI.

Keywords: *Artificial Intelligence (AI), music, learning applications, professional training.*

THE ASSOCIATION BETWEEN PERCEIVED DISCRIMINATION AND EDUCATIONAL EXPECTATIONS AMONG HIGH SCHOOL STUDENTS BY RACIAL MINORITY STATUS

Sabruna Dorceus, & Tanya Joseph
Department of career guidance, Université de Sherbrooke (Canada)

Abstract
Recent research in career development highlights the potential impact of perceived discrimination on the career choices of individuals from marginalized groups, including racialized communities (Swanson & Fouad, 2020). Perceptions of both overt and covert forms of discrimination—such as microaggressions—could contribute to the narrowing of career options (Poon, 2014), foster negative perceptions regarding career future (Conkel-Ziebell et al., 2019), and lower career expectations (O'Hara et al., 2012). Despite these findings, few studies have systematically assessed perceptions of discrimination, and their association to career choices remains underexplored, particularly when considering racial minority status within the Canadian context. Therefore, this study aims to 1) examine the association between perceived discrimination and educational expectations of high school students from diverse backgrounds and 2) explore whether these associations differ based on students' racial minority status. To address these objectives, a sample of 756 high school students from Quebec (Canada) completed an online survey between May 2022 and February 2023 (M = 16.3 years old; SD = 0.9). Among the participants, 52% identified as female, 46% as male, and 2% identified otherwise. Notably, the sample includes a majority of racialized students (72%) and over one-third of students with an immigrant background (38%). The frequency of perceptions of both overt (physical and verbal violence, exclusion and injustice, stigmatization) and covert (environmental invalidations, assumption of inferiority, invisibility and devaluation, assumption of criminality) discrimination was assessed using adapted items from validated scales. Educational expectations were identified by the highest level of education individuals realistically expected to achieve. Moderation regression analyses with racial minority status as a categorical moderator were conducted, controlling for parental education levels. Significant associations emerged between specific forms of perceived discrimination and educational expectations. More frequent perceptions of invisibility and devaluation, environmental invalidations, and stigmatization were negatively associated with educational expectations. Moreover, the moderation analysis revealed that the association between assumption of criminality and educational expectations differed by racial minority status. Specifically, the association was negative among non-racialized youth, but substantially attenuated among racialized youth. These findings suggest that the association between perceived discrimination and educational expectations may be shaped by identity-related coping mechanisms and contextual interpretation of discriminatory experiences.

Keywords: *Perceived discrimination, educational expectations, high school students, racial minorities, regression analyses.*

FROM KNOWLEDGE TRANSFER TO LEARNING SUPPORT: NEW ROLES FOR TEACHERS IN THE AGE OF AI

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Abstract
AI-supported learning environments are transforming continuing higher education at the structural and personnel levels. Instructors are taking on new roles as learning facilitators, providers of feedback, interpreters of data, and more. This shift requires new competencies, including a greater understanding of technology and ethics, as well as improved pedagogical reflection skills. Higher education institutions must proactively facilitate this transition by providing targeted training and recruitment.

Keywords: *AI, teaching role, learning environment, personalization, scientific continuing education.*

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A MODEL FOR ASSESSING XXI CENTURY COMPETENCIES IN THE CONTEXT OF PROBLEM-BASED LEARNING

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Abstract
The article presents a model for integrating XXI century competencies into summative assessment through the application of Problem-Based Learning (PrBL). It presents a conceptual framework based on an adapted version of the World Economic Forum framework, which combines traditional knowledge assessment with the evaluation of key XXI century competencies. The framework includes four groups of competencies: Cognitive – critical thinking, problem solving, creativity; Social-emotional – collaboration, communication, ethics and social responsibility, global awareness, intercultural sensitivity; Personal – self-regulation, self-confidence and adaptability, initiative and entrepreneurship, lifelong learning; Transversal – digital competency. Depending on whether the relevant competency is acquired as a targeted result or as a secondary effect of the educational process, competencies are systematized into two subcategories: explicit, which manifest themselves as planned outcomes and a transition from conscious incompetency to conscious competency, and implicit, which arise as significant secondary outcomes for the personal and social development of students. The framework offers the possibility of integrating key competencies into specific criteria for assessing mathematical problems, but its structure allows for adaptability to different disciplines and educational contexts. When expanded with achievement indicators and a rating scale, the framework can be transformed into a meaningful rubric. In conclusion, the importance of competency-oriented frameworks as a means of synchronizing traditional educational content with contemporary educational requirements is emphasized, with an accent on the need for future testing of implicit socio-emotional competencies in a real school context.

Keywords: *Problem-based learning, formative assessment, summative assessment, XXI century competencies, conceptual framework for competency assessment.*

ACTUAL PROBLEMS OF MODERNIZATION AND INTERNATIONALIZATION OF EDUCATION IN QAZAQSTAN

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Abstract
Education in Kazakhstan is currently undergoing significant transformation. At all levels of education, from preschool through secondary and higher education, modernization processes are taking place: standards are changing, concepts are being developed, and new models of teaching and upbringing are being introduced. The aim of this article is to present to the global educational community the features of education development in Kazakhstan and to familiarize international colleagues with the specifics of the countrys educational policy, which combines both domestic and global resources. The authors of the article focus primarily on reforms in secondary education. Using specific examples, the authors demonstrate the results of their research on evaluating the schools educational environment.

Keywords: *Education, higher education, modernization, international cooperation, development, relationship.*

FROM SHOCK TO REFLECTIVE PRACTICE: RETHINKING TEACHER PROFESSIONAL DEVELOPMENT ECOSYSTEMS IN SCHOOL

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Abstract
The transition from initial teacher education to everyday classroom practice often confronts teachers with "reality," "cultural," or "practical" shock, revealing a gap between theoretical preparation and lived professional experience (Jauhari & Sofi, 2023; Ben-Amram & Davidovitch, 2024; et al.). To bridge this gap, teacher professional development should be rethought not as an external training system but as a continuous, embodied, and reflective process embedded in the daily life of the school. Traditional professional development practices are frequently criticized for failing to meet teachers' real needs. When educators are treated as passive recipients rather than active learning agents, professional development becomes a matter of compliance rather than transformation. Therefore, this presentation addresses the question of how the school's professional environment or ecosystem can foster teachers' personal and professional growth, and through which pathways teachers transform their experiences from initial shock to reflective practice? The main aim of the presentation is to demonstrate how teacher professional development ecosystems can be transformed into embodied-reflective practices that support sustainable professional growth within the school. The emphasis lies on strengthening teachers' capacity to take ownership of their professional learning while cultivating future-oriented competences essential for navigating rapidly changing educational contexts. Methodologically, the presentation is grounded in an auto-narrative reflection based on several years of qualitative research exploring teachers' professional development and reflective practice. This reflexive approach allows the researcher to interpret and re-contextualize previously conducted studies through the lens of professional experience, critical self-analysis, and embodied reflection. Such perspective reveals how teachers' growth processes evolve within dynamic school ecosystems that integrate individual, collaborative, and institutional dimensions of learning. The methodological orientation emphasizes long-term engagement, iterative analysis, and continuous dialogue between research data and professional practice, enabling a deeper understanding of how reflective and embodied processes shape teachers' identities, agency, and organizational learning. Findings reveal that professional growth unfolds across three interconnected levels: personal reflection, collegial collaboration, and institutional support. Reflection functions both as an individual cognitive-emotional process and as a collective practice rooted in school culture. Teachers reported that systematic reflection enhanced their professional identity and agency. Collegial relationships fostered trust, creativity, and shared innovation, while institutional structures ensured purposeful, coherent, and continuous professional learning. The study underscores the importance of embodied reflection, where cognitive, emotional, and bodily awareness intertwine. A consistently cultivated reflective culture thus emerges as an effective ecosystemic model that nurtures teachers' professional wisdom, agency, and organizational learning.

Keywords: *Reflective practice, professional development, ecosystems, school culture, teacher.*

TRAINING QUALIFIED PROFESSIONALS IN CARE PROVISION IN CROSS-BORDER RURAL AREAS: THE CASE OF THE PROXIMITY TRAINING PROJECT

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Abstract
Rural cross-border regions in Northern and Central Portugal and Spain are experiencing accelerated population ageing, low population density, and persistent territorial asymmetries that challenge the provision of care services. In these contexts, the growing prevalence of dependency among older adults

places increasing pressure on already fragile social and health systems. The shortage of qualified professionals, combined with geographic dispersion and limited access to specialized services, highlights the urgent need for structured capacity-building strategies tailored to the specific characteristics of transboundary rural territories. Based on the work carried out within the scope of the POCTEP-Proximity Training project, this study aims to analyse the importance of qualifying professionals in care provision to dependent persons in low-density cross-border regions and to propose an integrated training framework addressing identified territorial and demographic challenges. First, the article characterizes the cross-border territory, examining demographic trends and ageing indices. Second, it presents the development of structured training pathways, including the design of a training-of-trainers model to ensure pedagogical sustainability and regional scalability. Third, it details the implementation of competency-based training programs for care technicians, focusing on technical, relational, and community-oriented skills adapted to rural environments. Finally, the study describes the development of pedagogical manuals designed to support both trainers and trainees, ensuring methodological coherence and practical applicability within the Portuguese-Spanish cross-border context. The proposed framework emphasizes interinstitutional cooperation, harmonization of competencies across borders, and the use of flexible learning modalities (blended learning; learning by doing or job shadowing) to overcome geographic barriers. By strengthening local human capital and promoting knowledge transfer, this model contributes to improving quality of care, enhancing professional recognition, and fostering social cohesion in vulnerable rural areas. The findings support the argument that targeted, territorially grounded training strategies are essential to ensure sustainable long-term care systems in ageing cross-border regions.

Keywords: *Rural ageing, cross-border regions, care provision, professional training, capacity building.*

BRIDGING EDUCATION AND LABOUR-MARKET DATA: LINKING CURRICULUM ORIENTATION WITH ADULT SKILLS – A METHODOLOGICAL FRAMEWORK

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Abstract
Understanding how the orientations of national curricula influence individuals' skills and labour-market outcomes later in life remains a central question for both education economics and policy design. While many European education systems have shifted from knowledge-based to competence-based curricula over the last decades, evidence of their long-term effects on adult competences and employability is still scarce. This paper presents a methodological framework for linking indicators of curriculum orientation in compulsory education with adult skills data from the OECD's *Programme for the International Assessment of Adult Competencies* (PIAAC). Building on education policy information from *Eurydice* and TIMSS 2023, the framework proposes a cohort-based linkage design that connects the schooling experiences of specific age groups with their later skill profiles in PIAAC 2022. This approach allows for examining whether exposure to competence-based curricula during schooling years is associated with higher problem-solving competences in adulthood, as well as with more favorable labour-market outcomes such as employment status or occupational skill use. The paper discusses major conceptual and methodological challenges in bridging education and labour-market datasets, including temporal alignment across surveys, differences in competence definitions, and cross-national variation in curriculum implementation. It also outlines strategies for operationalising curriculum orientation as a system-level variable suitable for cross-country comparative research. Preliminary descriptive analyses for a subset of EU member states illustrate the feasibility and policy relevance of this approach. By integrating curriculum policy data with adult skills assessments, this framework contributes to understanding the long-term effectiveness of competence-based education reforms. It provides a foundation for future empirical research on how early educational design choices translate into lifelong learning outcomes and labour-market resilience. Therefore, this study aligns with END 2026's focus on curriculum innovation, assessment, and educational policy, offering a framework how to bridge education research, economics of education, and workforce development.

Keywords: *Curriculum orientation, competence-based education, PIAAC, education-labour linkage.*

SEE THROUGH MY EYES: A VR-BASED PEDAGOGICAL TOOL FOR UNDERSTANDING SENSORY EXPERIENCES IN RETAIL SPACES FOR THE NEURODIVERSE POPULATION

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Abstract
See Through My Eyes: A VR-Based Pedagogical Tool for Understanding Sensory Experiences in Retail Spaces for the Neurodiverse Population. This research presents the development of an immersive virtual reality simulation designed to educate neurotypical individuals about the sensory challenges neurodiverse people face in retail environments. The project leverages experiential learning to foster empathy and awareness by placing users in a first-person, quest-driven VR supermarket experience, enriched with dynamic sensory stimuli such as flashing lights, loud noises and environmental distractions, that mirror real-world sensory challenges. Grounded in a comprehensive literature review, and guided by inclusive design principles, the simulation was developed using Unity and deployed on a Meta Quest 3 headset. It integrates voice-over narration, and interactive coping mechanisms to enhance user engagement and emotional resonance. Technical validation through Black Box testing and user evaluations confirmed the experience's effectiveness in promoting understanding and empathy, with participants reporting increased awareness of neurodiverse perspectives. This work contributes to the field of educational technology by demonstrating how VR can be harnessed as a scalable, accessible tool for neurodiversity education. It lays the groundwork for future enhancements and broader applications in inclusive design training, public awareness campaigns and curriculum development.

Keywords: *Virtual reality, neurodiversity, sensory overload, empathy, inclusive design.*

CONNECTING WITH CONFIDENCE IN THE ESL CLASSROOM: A LONGITUDINAL STUDY ON SELF-EFFICACY, RELATIONSHIPS AND CLASSROOM MANAGEMENT IN ESL TEACHER EDUCATION – PHASE 1

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Abstract
Teacher self-efficacy, classroom management, and teacher-student relationships are central components of effective teaching, particularly in second language classrooms where emotional demands and communication challenges are often heightened. While these constructs have been widely examined in teacher education, much of the existing research relies on short-term or cross-sectional designs, offering limited insight into how they evolve together in the early years of teacher education. This paper presents the initial methodological phase of a longitudinal study following a single cohort of 37 pre-service ESL teachers enrolled in a four-year teacher education program at a Canadian university. Based on social cognitive theory, the study places teacher self-efficacy at the center of an examination of classroom management and teacher-student relationships. A repeated measures design is employed, with the same questionnaire administered before and after each of the four practicum experiences evenly distributed across elementary and secondary school contexts. Data collection focuses on pre-service teachers' perceptions of self-efficacy, classroom management, emotional regulation, and teacher-student relationships. This paper outlines the research design, participant context, instruments, and planned analytical approach, with particular attention to feasibility, ethical considerations, and longitudinal consistency. By integrating data collection into practicum seminars, the study addresses common challenges related to attrition and measurement stability in longitudinal teacher education research. Positioned as a work in progress, this paper presents a clear and feasible methodological framework for examining how pre-service teachers develop over time.

Keywords: *Self-efficacy, classroom management, teacher-student relationships, ESL teacher education, longitudinal research.*

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ENHANCING DIGITAL LITERACY AMONG TEACHER EDUCATORS IN MOZAMBIQUE: A CAPACITY-BUILDING PROGRAM

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Abstract
This paper reports the first stage of a capacity-building program designed to develop digital literacy among teacher educators in Mozambique, under the Erasmus+ DILIGENCE project. The project addresses a key challenge in Mozambique's education system by promoting digital literacy in teacher education. The first step is to contribute to empower teacher educators across Mozambique by equipping them with essential digital skills they can apply and transfer to their teaching practice. Developing digital literacy as a means of critical empowerment of teacher educators will enable them to integrate digital tools and resources into pedagogical practices that foster critical thinking, sustainability, entrepreneurship and democratic culture. As part of this project, an innovative framework was developed, along with the implementation of an online course for teacher educators, by a collaborative team of European and Mozambican higher education teachers. The structure of the framework and the course, co-developed based on theoretical background and contributions from previous experiences and expectations, will be presented. The expected outcomes, based on enhancing teacher educators' digital competencies and pedagogical skills, will also be presented.

Keywords: *Digital literacy, framework, Mozambique, teacher education.*

TEACHERS' INTENTIONS TO USE AI FOR FORMATIVE ASSESSMENT

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Abstract
The artificial intelligence revolution is transforming education at an unprecedented pace, offering a diverse range of innovative opportunities for teachers and learners (Molina et al., 2024). The innovative potential of AI becomes particularly evident in formative assessment – AI can: capture each learner's individual progress (OECD, 2026), integrate continuous feedback into daily teaching and learning practice (UNESCO, 2025), and provide instruction that responds to individual learning needs and tools that enable more effective student learning (Molina et al., 2024). However, it has been observed that over the course of a century, each new innovation—from calculators to artificial intelligence—has encountered skepticism from educators (McGehee, 2024). Thus, it is not coincidental that Kalniņa, Nīmante, and Baranova (2024) highlight a gap between theoretical recognition of AI's potential and its practical application. This raises important questions about the use of AI in formative assessment. However, the integration of AI in formative assessment remains a relatively new research domain, leading to knowledge gaps related to teachers' decision-making processes regarding the adoption of these technologies and the factors that most strongly influence their decisions. According to Ajzen's (1991) theory of planned behavior, human behavior is largely determined by behavioral intentions. Consequently, teachers' use of AI in formative assessment can be partially attributed to their intentions to engage in such practices. These considerations establish a compelling rationale for investigating teachers' intentions to use AI in formative assessment. Based on Ajzen's theory (1991), the TI-AIFV scale was developed to measure teachers' intentions. All items employ a first-person perspective appropriately, and behavior, target, context, and time remain consistent across all items. The pilot study revealed high levels of scale validity and reliability. Using this scale, a representative sample of Lithuanian teachers was surveyed at the beginning of 2026. The findings show that only 30,5% of respondents intend to use AI in formative assessment, a large proportion are uncertain, and 10% do not intend to use it. Those who plan to use AI in formative assessment are more often women, individuals with a master's degree, and those who use AI more frequently in their personal lives. This investigation provide background for the development of targeted professional development programs, inform strategic planning for AI implementation in educational settings, and guide the formulation of educational policies that support successful AI integration into pedagogical practice.

Keywords: *Artificial intelligence, formative assessment, teachers.*

HYBRID TEACHING AND RUBRIC ASSESSMENT: A COMPARISON OF PERSPECTIVES IN TEACHER TRAINING

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Abstract
Practical training constitutes a central arena in which pre-service teachers develop professional competencies and a sense of teaching identity. This mixed-methods study examines the implementation of advanced pedagogical and technological frameworks within hybrid practicum settings in the post-pandemic era. Specifically, it explores how different stakeholders—pre-service teachers, teacher trainers, and academic supervisors—evaluate instructional practices and uses of digital technology by applying the SAMR (Substitution, Augmentation, Modification, Redefinition) model, the extended flipped classroom model, and Kolb's Experiential Learning Cycle (ELC) as the primary conceptual analytical lenses. To bridge the gap between these theoretical constructs and practical evaluation, a comprehensive assessment rubric was designed and implemented. This rubric served as a structured bridge designed to translate abstract pedagogical theories into observable, assessable teaching behaviors. By providing a unified analytical lens, the rubric facilitated both formative and summative evaluation. Participants included 75 pre-service teachers, 69 teacher trainers, and 58 pedagogical supervisors from diverse training contexts. An analysis of the findings derived from the rubric through the prism of the SAMR framework levels showed that pre-service teachers' use of technology relied mainly on the first two entry-level stages: Augmentation was the most prevalent practice, alongside instances of Substitution. While the rubric documented the frequent use of basic digital tools, such as presentations and videos, the more advanced stages of the theory, such as technologies enabling collaborative, inquiry-based, or creative learning, were rarely observed. Notably, a significant perception gap emerged at the higher levels of the SAMR model: pre-service teachers rated their technology integration at the transformative levels (Modification and Redefinition) significantly higher than did pedagogical academic supervisors. This finding points to a potential mismatch between pre-service teachers' self-perceptions and the expectations held by more experienced evaluators. Regarding broader pedagogical components, classroom management received high ratings across all groups. However, the rubric data highlighted a divergence in the interpretation of learner-centered pedagogy: pre-service teachers assigned higher scores than supervisors to learner engagement and attention to learner diversity. The authors suggest that this difference may reflect a gap in the conceptual depth with which stakeholders perceive these theories; while pre-service teachers may hold a simplified understanding, supervisors apply a more nuanced, experience-based interpretation of these pedagogical constructs. In conclusion, the study demonstrates that the assessment rubric serves as a pivotal tool for supporting pedagogical dialogue, reflection, and professional growth grounded in established theory, within hybrid teacher-training contexts. By operationalizing theoretical frameworks into concrete, assessable behaviors, the rubric serves as a vital bridge between theory and practice while providing a structured basis for constructive feedback. Ultimately, these findings underscore the necessity for teacher education programs to move beyond basic digital substitution, fostering pedagogical environments that support more transformative and integrative uses of technology.

Keywords: *Pre-service teachers, teacher trainers, hybrid practical training, assessment rubric, SAMR framework.*

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REIMAGINING CURRICULUM IN NURSING EDUCATION: A NARRATIVE INQUIRY INTO CHANGE AND PROFESSIONAL EXPERIENCE

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Abstract
Curriculum is never static. It evolves and shifts with the people experiencing it. This study investigates curriculum making as a lived process that connects teachers and students through shared educational experiences. Drawing on Clandinin and Connelly's (1992) view of curriculum as lived experience, the inquiry explores how meaning and knowledge are constructed within a changing professional knowledge landscape in nursing education. Narrative inquiry was selected as the research methodology because it captures the temporal and storied aspects of human experience. It demonstrates how educators and students build identity, knowledge, and purpose through storytelling. The study explores the tensions between the envisioned curriculum design (what ought to happen) and what actually happens in classroom practice. The research was conducted in a baccalaureate nursing program at a small Canadian university that implemented significant curricular changes in response to evolving healthcare and educational needs. The research shows how identities, values, and relationships become part of curriculum work, shaping what counts as knowledge and what sometimes gets lost. Viewed this way, curriculum is less a product to be delivered and more a shared human practice, created through conversation, struggle, and care. The findings also demonstrate how personal, social, and institutional factors continuously shape nursing curricula. Through narrative accounts, the study highlights relationships among teachers, learners, subject matter, and context. These insights provide new perspectives on thinking of curriculum as a human and educational process that prepares nurses for an unpredictable and evolving professional world.

Keywords: *Nursing education, curriculum, pedagogy.*

DEVELOPING FUTURE TEACHERS' INTERCULTURAL COMPETENCY: AN EXPERIENCE "IN CONTEXT"

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Abstract
Developing intercultural competence (IC) is increasingly considered essential for preparing future teachers for diverse educational and professional contexts. In Québec, teacher training programs (TTP) introduce student teachers (ST) to key concepts related to diversity and interculturality. IC can be understood as a *savoir-agir*, or the ability to act appropriately in context, encompassing attitudes and skills such as flexibility, empathy, communication, and conflict resolution. In classroom settings, these dispositions play a key role in shaping student–teacher relationships and overall teaching effectiveness. TTPs therefore aim to support ST in developing this capacity, notably through experiential learning opportunities such as international mobility. This study examines the impact of a short-term international teaching experience on the development of IC among ST. As part of a French-as-a-foreign-language course at Université du Québec à Trois-Rivières (UQTR), eight student teachers conducted French lesson in Hanoi, Vietnam, over a two-week period. Data were collected through a post-project questionnaire and a focus group. Results indicate improvements in pedagogical competencies, including lesson planning, adaptation to learners' needs, and communication skills. However, contrary to expectations, participants did not report significant gains in intercultural competence.

Keywords: *Intercultural competence, foreign language teaching, teacher training, teaching abroad, student teacher.*

"I NEED TO JOIN THE GROUP, THEN I'LL KNOW EVERYTHING" LEARNING COMMUNITIES AS A BASIS FOR MUTUAL LEARNING AND SOCIAL RESILIENCE

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Abstract
This paper examines informal communities—such as scouting groups, prepper networks, and rural women's circles—as environments for adult learning and social resilience. Drawing on a qualitative ethnographic study of nine diverse communities in Poland, the research explores how these groups function as spaces where knowledge is co-created through shared practice and interaction. Using in-depth and dyadic interviews, the study analyzes participants' motivations, learning mechanisms, and the impact of community involvement on personal and professional trajectories. The findings reveal that learning emerges organically through observation, imitation, feedback, and the exchange of experience, fostering the development of social, intrapersonal, and specialized competencies. Furthermore, the paper identifies diverse strategies of knowledge verification—ranging from practical usefulness to relational trust—which influence communities' resilience to disinformation. The study concludes that informal networks constitute a vital infrastructure for lifelong learning and play a significant role in strengthening social resilience in contemporary societies.

Keywords: *Learning communities, informal learning, mutual learning, social resilience, disinformation.*

STUDENT COMPETENCIES AND TEACHER KNOWLEDGE IN MATHEMATICS: A COMPARISON BETWEEN GERMANY AND BRAZIL

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Abstract
International large-scale assessments such as the Program for International Student Assessment consistently reveal substantial country-level differences in mathematics achievement among 15-year-old students. But when do these gaps begin to form? Are they already present at school entry, or do they develop during the first years of schooling? To address these questions, we conducted a cross-cultural study combining student diagnostics and teacher knowledge assessment in Germany and Brazil. This approach (two populations: students and teachers; two countries: Germany and Brazil) aims to shed light on the timing and mechanisms behind international achievement gaps in mathematics. First, we assessed arithmetic competencies of first- and third-grade students in both countries ($N = 339$) using two diagnostic instruments tailored to the respective grades. These instruments capture number sense, basic operations, continuing sequences, and problem solving. Data were collected in Germany from $n = 75$ first graders (four classes in two schools) and $n = 93$ third graders (four classes in two schools), and in Brazil from $n = 84$ first graders (four classes in two schools) and $n = 87$ third graders (four classes in two schools). This allowed us to examine whether performance differences between countries already exist in Grade 1 or begin to emerge with formal schooling (i.e., between Grades 1 and 3). Second, we measured in both countries teachers' pedagogical content knowledge (PCK) — a key dimension of professional expertise that enables teachers to transform mathematical content into accessible learning experiences. We developed a new PCK test for primary school teachers based on several open-ended tasks. Items require analyzing specific student solutions, identifying misconceptions, and proposing instructional strategies. The PCK test was administered to a total of $N = 137$ participants, including $n = 63$ primary mathematics teachers in Brazil and $n = 74$ mathematics student teachers in Germany. Responses were evaluated using a scoring rubric that distinguishes levels of didactic reasoning, ranging from procedural to conceptual. Here, we discuss the theoretical foundations, methodological challenges, and first comparative results of both studies based on example items of the student and teacher tests (results for the full scales will be presented in the talk).

Keywords**:** *Pedagogical content knowledge, mathematics education, teacher education, cross-cultural comparison, assessment*.

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PRACTICE ORIENTED TEACHER TRAINING PROGRAM IN HUNGARY – RESULTS OF THE PILOT YEAR

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Abstract
One of the most significant determinants of educational quality is the professional preparedness of teachers; therefore, ensuring a steady supply of well-qualified educators is a priority in every country's education policy. Since 2019, our university has been engaged in a long-term development process aimed at modernising teacher education and strengthening a practice-oriented, competence-based approach. As a result of these efforts, a new practice-focused concept of teacher education was introduced in Hungary in 2024, supported by Government Decree 255/2024 (VIII.22.). Another international program at our university fits well with this concept: "Educational Cosmopolitans, International Perspective in Teacher Training," supported by the Tempus Public Foundation as the "learning in technology and society" approach reinforces the principle that teacher training can be most effective if we integrate the opportunity for reflection in a practical school environment into the training and prepare our students for international cooperation and participation in international competitions. The present study outlines the structure of the pilot programme, summarises experiences from its first academic year and impact of international academic course. The impact assessment followed a mixed-methods research design (quantitative and qualitative). The longitudinal framework comprised four measurement points (baseline, end of first year, mid-programme, final assessment), enabling temporal tracking of changes and developmental patterns. Quantitative instruments included validated psychological scales, and institutionally developed tools assessing career-choice motivations, professional competences and expectations. Qualitative data were collected through focus-group interviews, as well as students' reflective journals. The research targeted three groups: students, teacher educators, and school-practice mentors, supplemented by insights from programme coordinators and institute directors. Among students, the analysis focused on psychological need satisfaction, learning motivation, preconceptions about teaching, and the development of transversal competences. Results indicate that students' autonomy, competence and relatedness needs were strongly supported, intrinsic motivation increased, and early school-based experiences played a crucial role in shaping teacher identity. Data from teacher educators revealed role changes associated with the shift towards practice-orientation, including a rebalancing of disciplinary and pedagogical knowledge and an intensification of collaboration with partner schools. For mentors, the study examined their contributions to students' professional development, shifts in motivation and commitment, perceptions of workload, and the functioning of university – school cooperation. Overall, first-year findings show that the practice-oriented, value-centred model has brought positive changes across all target groups. The results suggest that this model offers a promising long-term framework for preparing future generations of competent, reflective and committed teachers. The presentation was funded by the Tempus Public Foundation (2024-1-HU01-KA220-HED-000248326).

Keywords: *Practice-oriented teacher training, teacher competences, mixed method research, career socialization, first pilot year results.*

STREAMLINED STRATEGIC PLANNING FOR STUDENT SERVICES: A REPLICABLE FRAMEWORK FOR GLOBAL CONTEXTS

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Abstract
How can student service units create effective strategic direction when institutional contexts evolve and staff transitions disrupt organizational memory? This presentation shares a tested three-session planning process that university educators can adapt across diverse contexts and resource environments. Drawing from a case study at a U.S. research university, we demonstrate how a student services unit facing common global challenges—significant staff turnover, absent foundational planning elements, and the need to align with new institutional priorities— developed a comprehensive strategic framework efficiently while

building collective ownership. The process employed professional standards for academic advising and student services (NACADA/CAS Standards), which emphasize evidence-based practices, learning-centered approaches, and continuous improvement. Working with an external facilitator, the unit completed a streamlined three-session process with intersession assignments. Contrary to typical experiences with strategic planning, this approach proved remarkably efficient while yielding substantial, actionable results. Session one focused on mission statement development, examining core purpose and target populations. Session two centered on articulating core values—Inclusivity, Empowerment, Support, and Transformation—with detailed descriptors defined through participants' diverse professional perspectives. Participants then developed SMART goals aligned with services and priorities. The final session linked values to strategic priorities with measurable outcomes and timelines. The process produced four tangible deliverables that transformed the unit's operational framework: a refined mission statement emphasizing student-centered services and transformative education; four core values with implementation descriptors; a comprehensive expansion of services beyond basic support to include recruitment, communications, programming, and student organization support; and strategic priorities including specialized programming for international students, streamlined access to essential resources, and initiatives preparing students for professional transitions. This presentation demonstrates that strategic planning need not be arduous or time- consuming. The framework is adaptable to institutions of varying sizes, structures, and educational systems. While developed in a well-resourced setting, the core methodology— engaging skilled facilitation, employing professional standards, maintaining focus on mission, and creating space for collaborative meaning-making—offers transferable principles for student services units globally. The presentation welcomes comparative discussion with educators implementing strategic planning across diverse institutional contexts, inviting participants to consider how this framework might be adapted to their unique cultural and organizational environments.

Keywords: *Strategic planning, student services, SMART goals, higher education, organizational leadership.*

TEACHER SOCIAL SUPPORT IN 4TH-5TH GRADE: COMPARING PUPIL AND TEACHER PERSPECTIVES

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Abstract
This paper presents partial findings from an ongoing mixed-method study comparing two perspectives: how pupils perceive the social support provided by teachers, and how teachers reflect on their role as providers of this support. The broader research includes two developmental groups of pupils (grades 4–5 and 8–9), with this paper focusing on younger pupils aged 9–11 and their perceptions of teacher social support. The quantitative part uses the Child and Adolescent Social Support Scale (CASSS) and captures the perception of social support from teachers, parents, and peers. These data serve as a starting point for subsequent interpretation alongside the teacher perspective. The qualitative part is based on semi-structured interviews with teachers, which aim to understand how teachers interpret pupils' needs, how they view their own provision of support, and how they believe pupils perceive their support. When interpreted alongside the quantitative findings, the qualitative data enable a broader understanding of both perspectives and highlight possible points of convergence and divergence without directly comparing the two datasets. Qualitative data are analysed using thematic analysis (Braun & Clarke, 2006). The theoretical framework of the project is Bronfenbrenner's socio-ecological model (2005), which allows both perspectives to be situated within the context of multi-level systems: the microsystem (immediate teacher-student interaction), mesosystem (links between school and family), exosystem (institutional conditions affecting teachers), and macrosystem (broader cultural and social norms associated with education). This framework makes it possible to identify how individual actors construct their understanding of social support and how their views differ or overlap. The study highlights the value of integrating both perspectives for understanding how supportive relationships are formed in schools and how pupil wellbeing and classroom climate can be meaningfully enhanced. The analysis also provides a basis for broader comparisons across levels of education. The findings may provide useful insights for future pedagogical practice, teacher training, and the development of support measures in schools.

Keywords: *Social support, pupil and teacher perspectives, thematic analysis, socio-ecological model.*

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MUSIC EDUCATION IN CROATIA: PERSPECTIVES OF MUSIC PEDAGOGY STUDENTS ON THEIR FUTURE CAREERS

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Abstract
In the Music Pedagogy study program, students acquire and develop competencies in practical music, music theory, and pedagogical subjects. Upon graduation, they are qualified for employment in both music schools and general education schools. The aim of this research was to explore the professional aspirations of future music educators and to determine whether there are statistically significant differences in students' attitudes toward future pedagogical work based on sociodemographic variables. The research, conducted in 2025 via an anonymous survey, included 79 Music Pedagogy students in the Republic of Croatia. The results indicated that an equal number of students would like to work in general education schools and music schools. The primary reason cited for their choice was the specific student profile associated with each school type. Students believe they acquire and develop professional and pedagogical competencies to a significant extent during their studies. They also believe they will work successfully with parents, especially with students and colleagues, and anticipate high job satisfaction. A slightly lower level of agreement was determined regarding the statement that their future job would not be a source of stress. It was found that female students have a more pronounced awareness of lifelong learning, while students in higher years of study are more optimistic about future professional satisfaction. The results of this research can contribute to a better understanding of the professional expectations of future music educators and can be used to improve the study curriculum, particularly in preparing students for stressful work situations.

Keywords: *Music pedagogy students, expectations of the future profession, professional and pedagogical competencies, music teaching.*

HOW UNIVERSITY STUDENTS UNDERSTAND SUSTAINABILITY: EXPLANATORY FACTORS

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Abstract
Sustainability has become a fundamental pillar of public policy and higher education, where university students are key players both as recipients of knowledge and as agents of change toward responsible practices. The literature shows that their attitudes, beliefs, and behaviors regarding sustainability are influenced by various explanatory factors, the understanding of which is essential to promoting a genuine and lasting commitment. One of the primary factors is the clarity of the concept of sustainability, as a lack of precise definitions can generate confusion and hinder the adoption of coherent practices. Simultaneously, lifestyle and daily habits (diet, transportation, consumption, recycling) determine direct environmental impacts. Academic and professional life also influence sustainability: study loads, financial demands, and time constraints can hinder participation in initiatives, although practical projects linked to learning reinforce preparation and motivation. In this context, awareness of initiatives within the faculty or university becomes a catalyst: when students perceive and understand institutional programs, their willingness to participate increases, and the coherence between attitude and action is strengthened. Another fundamental element is training and motivation toward sustainability. Explicit training, experiential learning, and faculty support enhance students' intrinsic and extrinsic motivation. Finally, university education as a curricular and pedagogical system is crucial: its explicit integration into programs and methodologies fosters sustainable competencies, while its absence or implicit treatment limits the development of knowledge and practices. This study provides a descriptive overview of the dimensions that will allow for the design of more effective educational and management strategies to strengthen student commitment to the Sustainable Development Goals and to building more responsible and resilient societies.

Keywords: *Sustainability, university student, academic life, motivation, higher education.*

STRATEGIES FOR REAL-TIME FEEDBACK AND INDIVIDUALIZED SUPPORT IN MATHEMATICS LECTURES

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Abstract
Fostering active engagement, rapid feedback, and individualized support are all part of student-centered teaching in higher education. Lecture-based teaching methods often restrict opportunities for meaningful student participation and delay the identification of learning difficulties. This paper examines strategies designed to accelerate feedback mechanisms and provide targeted assistance to support students to learn challenging mathematical concepts, with a particular focus on enhancing participation during lectures. We compare conventional lecture-based teaching with student centered teaching for medium sized classes of introductory calculus. We use quantitative methods based on the students' final percentage formed with the marks for the assignments, term exams, and final examination. The results show that student-centered strategies not only expedite feedback but also transform the lecture into a participatory and dynamic learning environment. Increased student involvement fosters greater ownership of learning, enhances motivation, and contributes to improved academic performance illustrated by a lower proportion of students that fail to pass the course.

Keywords: *Student-centered learning, real-time feedback, individualized support.*

DEFINITION AND STANDARDIZATION OF PROCESSES FOR THE ITALIAN SUPPORT TEACHERS COURSE: A ROADMAP TO QUALITY

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Abstract
Within the Italian school system, Law 517 of 1977 (long preceding the Salamanca Statement of 1994) abolished differential classes and special schools, and mandated that all children and young people share educational and training paths in common classrooms. Furthermore, the law introduced the support teacher, a specialized teacher, to support classes with pupils/students who have certified disabilities. In 2011, the Ministry reorganized the competency profile and the training plan for support teachers, entrusting universities with course implementation (approximately 800 hours over 9 months, including lessons, workshops, and internships). This organizational and didactic commitment proved challenging due to high participant numbers and objective criticalities: irregular scheduling of calls for applications, the need for academic faculty with significant school-life experience, high enrolment of working students, mandatory in-person attendance with strict absence policies (necessitating ad hoc lecture duplication and logistical reorganization of classrooms), management of national placements, etc. The University of xxx accepted this challenge, aligning with the public university's vocation as a driver of cultural, social, and economic development for the community. This contribution documents the definition and evolution of the didactic and managerial processes aimed at delivering a course that secures high-quality learning outcomes, benefiting learners with disabilities and their families, while also addressing the criticalities mentioned above. The initial management model was ad-hoc and unsystematic, characterized by a high non-reusable effort; the numerous variables, compressed timelines, and associated randomness introduce risks for the delivery of the service itself, as well as for the quality of the results. To overcome this criticality and transform organizational energy into a stable knowledge asset, the Course Management three years ago adopted the principles of Business Process Management (BPM). The method began with an in-depth diagnosis of the current state, "as-is" model, leading to the formalization and redesign of processes into an optimized "to-be" model. This initiated a roadmap for continuous improvement focused on elevating process maturity through the systematic integration of workflows, resources, pre-existing internal processes, and information systems. This action is intended to secure the achieved quality, guarantees efficient replicability in subsequent cycles, facilitate transferability to similar courses, and transform the acquired experience into a stable operational asset for the university.

Keywords: *Learning organization, university, course design, teacher training, special pedagogy.*

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DISCURSIVE ALGEBRAIC SKILLS AND THEIR IMPACT ON K–3 PRE-SERVICE TEACHERS' MATHEMATICAL WRITTEN EFFICIENCY

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Abstract
The objective of this study was to analyse the relationship between pre-service teachers' (PSTs') discursive algebraic skills and their written mathematical (specifically algebraic) achievements. The conceptual design consists of three theoretical perspectives that are merged in the study. This study used a mixed-methods design, combining quantitative and qualitative approaches. The PSTs completed an algebraic knowledge test designed to identify their discursive and algebraic knowledge, and a content analysis of their written texts was then performed. The written texts focused on algebraic patterns, concepts and their generalisation related to rational numbers, patterns in multiplication tables, proportionality and combinatorial concepts, including permutations and combinations. The results of this study are not generalisable due to objective limitations and the contextualisation of the research within a specific learning environment. However, the findings confirm the theoretical perspectives proposed by Vygotsky, Freudenthal and Kriegler's theoretical framework, and support the view that the development of prospective teachers' writing ability is not an isolated learning process. Rather, it likely occurs through interaction with the acquisition and development of algebraic content knowledge. Future research should include more empirical and analytical studies on the development of PSTs' discursive algebraic knowledge, particularly the processes underlying the formation and growth of proficiency in mathematical writing.

Keywords: *Discursive algebraic skills, algebraic concepts and generalisation, mathematical writing efficiency, pre-service teachers learning of algebra, algebraic thinking.*

SCIENCE ENJOYMENT AND ACHIEVEMENT: THE MEDIATING ROLE OF INTEREST IN PISA CONTEXTS OF UAE AND FINLAND

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Abstract
Based on the Program for International Student Assessment (PISA) secondary data analysis, this study investigated the relationships between students' enjoyment of science, interest in science, and science achievement in the UAE and Finland. It examines whether interest in science mediates the relationship between enjoyment and attainment in science. These findings suggest that science enjoyment and interest are strong predictors of science achievement, with interest serving as the primary mediator. However, the mediator of interest does vary between the two countries and supports the view that cultural and educational system differences impact how those factors interact. The results underscore the importance of fostering positive attitudes toward science to enhance educational outcomes. Additionally, this study contributes to science education literature by highlighting the development of intrinsic motivation through enjoyment and interest. It also provides valuable insights into educational reform within the UAE, suggesting that emphasis should be placed on creating an environment that fosters a sense of student autonomy, inquiry learning, and meaningful engagement with science. This would better help the UAE align teaching practices like those in high-achieving educational systems such as Finland, potentially leading to improved student scores in science achievement.

Keywords: *Student engagement, cultural perceptions of science, language and learning, sociocultural contexts, science achievement.*

THE FASHION CURRICULUM AS IMPASSE: ETHICAL SOURCING VS. THE IMAGE ECONOMY

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Abstract
Fashion design education currently operates within a structural impasse: it prepares students for an industry whose ecological consequences increasingly undermine the discipline's own rationale. This tension remains unresolved because most curricula prioritize "market-ready" aesthetics over environmental costs. In many world-renowned institutions, such as Central Saint Martins (CSM) or the Fashion Institute of Technology (FIT), sustainability is frequently treated as a modular 'add-on' rather than the core organizing logic of the design process. This separation allows studio culture to remain dominated by what this study terms the Image Economy. This logic shapes both orientations in fashion education, commercial ready-to-wear and avant-garde design, as both are built on producing new garments, not on transforming existing ones. The result is a double structural failure: neither track equips students to challenge or escape the Image Economy. To frame this tension theoretically, the paper draws on Choufan's (2024) analysis of the "mediatized designer," a figure whose creative identity is increasingly subordinated to the demands of social media visibility and entertainment. In this environment, students are pressured to prioritize "fast relevance" for the smartphone screen over long-term ecological imperatives. This visual saturation erodes students' critical capacity, creating a cognitive dissonance where the reality of fashion as an ecological villain paradoxically coexists with its digital glamour. Within this spectacle, garments are increasingly produced to be photographed rather than worn; consumed as images before they are consumed as objects. Based on ten years of experimental teaching at Shenkar College of Engineering, Design and Art (Israel), this paper proposes the SSS (Spatial, Sculptural, Storyboarding) Framework as a pedagogical intervention. Central to this framework is the use of the Kenyan dystopian film Pumzi (2009) as an affective and ethical trigger. Across multiple student cohorts, the film's vision of ecological collapse and resilience consistently functions as a catalyst for personal value articulation, establishing an ethical point of departure for the design process. Interestingly, an observation from the fashion forecasting sphere echoed this pedagogical direction: *Nova Fabula* (Texworld Apparel Sourcing Paris, 2026–27), a seasonal trend book, identifies sustainable textiles as a central future value within the industry. Rather than serving as a theoretical foundation, this reference illustrates how signals of transformation are already emerging within fashion's own forecasting culture. The study follows a cohort of fifteen third-year students who translated these spatial logics into garments using exclusively deadstock and textile remnants. The final outcomes were disseminated through collaborations with leading Israeli influencers, utilizing the Image Economy's own tools to demonstrate that fashion and sustainability are not a dichotomy.

Keywords: *Fashion design education, image economy, ethical sourcing, material accountability, pedagogical sequence.*

CREATING AN EFFECTIVE SECURITY STREAM IN A UNIVERSITY COMPUTER SCIENCE DEGREE

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Abstract
This paper presents a cybersecurity stream within a post-secondary institution's Computer Science program to meet the workforce demands for skilled security professionals. The proposed stream integrates core systems courses with specialized modules in system and network security, aligning with the ACM CS curriculum and CSEC 2017 guidelines. It emphasizes experiential learning through hands-on labs, Capture the Flag competitions, and community-based projects. Results indicate high rankings in competitions, positive feedback from community partners, job offers, and alumni success in security roles. Although current evidence is mostly anecdotal and scalability remains a challenge, the model offers a replicable framework for integrating cybersecurity education into Computer Science programs, thereby helping bridge the gap between theory and practice.

Keywords: *Cybersecurity education, experiential learning, cybersecurity stream in computer science.*

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DEVELOPING TEACHERS' DIGITAL COMPETENCES: INSTITUTIONAL APPROACHES (29)

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Abstract
The rapid expansion of digital technologies has made the digital transformation of education a necessity, placing new demands on teachers and educational institutions. One of the key steps in the digital transformation of education is developing teachers' digital competencies. As knowledge and skills evolve quickly, particularly in the context of digitisation, teachers are required to engage in continuous professional development and lifelong learning to maintain relevant competencies. Developing digital competences in the education system requires integrating ICT into teaching effectively and ensuring teachers receive the training and education to acquire these competences. The latter is probably the most important factor for the development of a digital culture in education. Educational institutions often face challenges in organising teacher training in digital competencies, as various internal and external factors influence these efforts. If an institution's strategy is more declarative than operational, the development of teachers' digital competences can be just a task on paper, while in practice, some concrete steps will be absent. Usually, to realise a strategy, a combination of top-down and bottom-up approaches is needed. Often, if there is no determination from the institution's management, the results will not reach their full potential. Every strategy needs an action plan and stakeholders responsible for its realisation; therefore, if an institution plans teachers' training in digital competencies, the best approach is to implement it through the strategy or a similar document. Teachers' training in digital competences is an ongoing process, as institutions must provide ongoing professional training for teachers. Such a process requires analysing the current situation, planning, a production phase, and reflecting on the achieved results, which will serve as the basis for continuing the process. During the pandemic, awareness of the need for teachers' digital competences has increased, while AI has additionally emphasised the need for teachers to have digital skills to design, develop, and organise innovative, learner-centred, competency-based, flexible and inclusive teaching, learning, and assessment activities. This paper highlights the importance of systematic and institutionally supported approaches to developing teachers' digital competences, emphasising strategic planning, structured training, and ongoing evaluation. Based on SRCE's long-term experience and expertise in providing sustainable, high-quality support and involvement in the national project e-Universities, SRCE analyses institutional approaches to teacher training. The findings underscore that the sustainable development of teachers' digital competences requires coherent strategies, adequate resources, and continuous support to ensure the effective integration of ICT into teaching and learning.

Keywords: *Digital competences, teachers, institutional approach, digital transformation.*

FROM CODE WRITING TO CODE JUDGMENT: A BLOOM-BASED REDESIGN FOR LEARNING PROGRAMMING WITH GENAI

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Abstract
Generative AI (GenAI) tools such as ChatGPT and GitHub Copilot are reshaping introductory programming in higher education. Because these tools can already produce functional solutions for many standard programming tasks, the manual production of syntactically correct code is becoming a less sufficient indicator of programming competence. This conceptual paper examines how introductory programming tasks can be redesigned using the revised Bloom's taxonomy. It maps traditional task formats and GenAI-based redesigns to Bloom's cognitive levels, using examples from control structures and introductory object-oriented programming. The analysis highlights a shift in competence emphasis from lower levels such as Remember, Understand, and Apply toward higher levels such as Analyze, Evaluate, and Create. In this context, students increasingly need to interpret, compare, assess, and deliberately revise AI-generated code. The paper argues for the pedagogical integration of GenAI into programming courses and outlines implications for redesigning exercises and assessments to foreground reflective code judgment.

Keywords: *Generative AI, introductory programming, bloom's taxonomy, task redesign.*

RELATIONSHIP BETWEEN EXECUTIVE FUNCTION AND READING COMPREHENSION: A SYSTEMATIC REVIEW

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Abstract
Introduction: In Brazil, difficulties with reading comprehension are identified later in the school context, usually after repeated failures that can lead to not only academic problems but also behavioral changes in children. *Objective:* The aims of this study was to conduct a systematic literature review to verify the relationship between executive function and reading comprehension. *Materials and Methods:* This is a systematic review study conducted using the PCC strategy, an acronym for Population, Concept, and Context (Peters, et al., 2020), to define the guiding question of the study: "What is the relationship between executive function and reading comprehension?". The literature review conducted to answer the guiding question followed these steps: a) Search strategies: the search for scientific articles was carried out over the last 11 years, from 2010 to 2025. The Pubmed, Scopus, and Web of Science databases were used for the search; b) Search strategy, inclusion and exclusion criteria: The terms used for the data search and applied to the combination of keyword groups in Portuguese were: leitura, comprensão de leitura, função executiva. In English, they were: reading, reading comprehension, executive function; c) Study eligibility criteria: Data extraction was performed using keywords based on the PCC strategy. Original articles published in full in national and international journals were included. *Results:* Thirty articles were found (100%), however, 19 articles (63%) were excluded because they dealt with the topic involving schoolchildren with neurodevelopmental disorders and intervention studies, leaving only 11 articles (37%) for full reading. *Conclusion:* The results of this study revealed that the executive functions of inhibitory control, working memory, and planning showed a relationship with reading comprehension in all the articles analyzed. Therefore, there is a need for this study to continue in order to broaden the discussions of this relationship also in the context of clinical and educational intervention.

Keywords: *Executive function, reading comprehension, learning.*

IMPACT OF SPEECH SOUND DISORDERS ON PREDICTIVE LITERACY SKILLS IN SOCIALLY VULNERABLE CONTEXT

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Abstract
Introduction: The context of social vulnerability can intensify phonological and linguistic deficits, compromising the development of skills predictive of literacy, such as vocabulary and metaphonological skills, phonological working memory, and speed of access to mental lexicon, and consequently, academic performance. *Aims:* The aims of this study was to characterize and compare the performance of schoolchildren with and without speech sound disorder in socially vulnerable context in predictive literacy skills. *Materials and Methods:* 31 students from the 1st and 2nd grades of Elementary School participated in this study, divided and classified according to the degree of severity speech sound disorders. Group I (GI) is composed by 14 students with speech sound disorders, and Group II (GII) composed by 17 students without speech sound disorders. All participants in this study attended, outside of regular school hours, a Non-Governmental Organization (NGO) located in the central-west region of São Paulo State, which serves children in socially vulnerable context. *Results:* The results of this study demonstrated that the interference of speech sound disorders was only observed in one of the predictive skills for literacy, the speed of access to the mental lexicon. *Conclusion:* Based on the findings of this study, it is not possible to conclude that speech and reading have partially distinct origins, since an important predictive skill for literacy, and consequently for reading, the speed of access to the mental lexicon, was the skill that proved most susceptible to the presence of speech sound disorders.

Keywords: *Learning, social vulnerability, speech sound disorders, predictors of literacy.*

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INTEGRATING BLOOMBERG INTO ACCOUNTING AND FINANCE TEACHING IN A UK HIGHER EDUCATION INSTITUTION

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Abstract
This paper examines the integration of Bloomberg terminals into the Accounting and Finance curriculum at a UK Higher Education Institution (HEI), addressing the growing need for industry-aligned, data-driven financial education. As employers increasingly expect graduates to demonstrate practical analytical ability and familiarity with professional platforms, the project sought to embed Bloomberg resources into core Accounting and Finance modules to enhance learning, engagement, and employability. Drawing on evidence collected over two academic years, the study evaluates how Bloomberg was incorporated into teaching, assessment, authentic learning activities, and independent research. Usage logs demonstrate exceptionally high engagement, with the Bloomberg Lab operating at approximately 97% capacity utilisation, particularly during assessment periods involving equity valuation, portfolio construction, investment analysis, and market analysis. This utilisation pattern indicates that students actively relied on Bloomberg to complete data-driven assignments and to develop practical financial and analytical competencies. The findings indicate that Bloomberg integration enhanced students' analytical capability, digital literacy, employability awareness, and confidence engaging with professional financial technologies. Bloomberg-supported learning enabled students to connect theoretical financial concepts with authentic market practice through the use of real-time data, financial modelling tools, and analytical functions. The integration of Bloomberg also supported the development of transferable graduate skills including critical thinking, problem-solving, communication, and independent research capability. Staff reflections revealed that successful implementation required curriculum alignment, scaffolded learning activities, authentic assessment design, and targeted training support for both staff and students. While challenges remained regarding digital confidence, technical complexity, and resource management, the findings demonstrate that Bloomberg integration can significantly enrich experiential learning and improve graduate preparedness within Accounting and Finance education. Overall, the integration of Bloomberg terminals enhanced learning quality, student engagement, digital competency, and professional readiness within the Accounting and Finance curriculum. The paper concludes with recommendations for embedding financial analytics platforms effectively within Higher Education programmes to support both academic development and employability within an increasingly technology-driven financial services sector.

Keywords: *Technology-enhanced learning, experiential learning, higher education pedagogy, employability in higher education, curriculum innovation.*

THE FOUNDATIONS OF PORTUGUESE STUDIES AT THE UNIVERSITY OF MEXICO

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Abstract
The historical memory of the Portuguese Department at the National Autonomous University of Mexico (UNAM) reflects the growing interest in the Portuguese language and Lusophone cultures within Latin American academia over nearly six decades. From its origins to the present day, the Department has played a key role in training specialists, teachers, translators, and researchers who have contributed to strengthening the cultural, linguistic, and literary ties between Mexico and Portuguese-speaking countries.

Keywords: *Portuguese as a foreign language, lusophone studies, UNAM, memory, language teaching.*

FOSTERING GENERAL COMPETENCIES THROUGH INTERDISCIPLINARY TRAINING: TEACHERS' PERCEPTIONS OF INTEGRATING HOME ECONOMICS AND STEAM

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Abstract
This study evaluates an in-service teachers' professional development initiative designed to integrate Home Economics (HE) with STEAM disciplines. Utilizing a mixed-methods case study ($N = 14$) at the Tallinn University Science Kitchen, the research assessed teacher perceptions of competence and implementation barriers following a five-day intervention. Findings reveal a significant shift in teacher identity; while only 21% reported prior STEAM competency, post-training engagement was exceptionally high, with a 100% immediate classroom application rate ($M = 5.43$). The specialized "makerspace" environment received a unanimous perfect score ($M = 6.0$), facilitating the development of integrated "knowledge-in-practice". However, a "transfer paradox" emerged: despite near-perfect teacher readiness to implement STEAM ($M = 5.93$), systemic constraints – specifically lack of shared planning time ($M = 4.57$) and disciplinary isolation – hinder school-wide integration. The study concludes that while HE is a vital "proto-STEAM" discipline, fulfilling national strategic goals requires moving beyond individual teacher training toward structural reforms that support interdisciplinary collaboration.

Keywords: *Home economics, STEAM, teacher professional development, science kitchen.*

MODULAR, ADAPTIVE CURRICULUM DESIGN FOR RAPIDLY EVOLVING DIGITAL DISCIPLINES: AN INTERDISCIPLINARY INFORMATICS AND DESIGN APPROACH

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Abstract
This paper presents the design and implementation of a practice-focused curriculum for a novel *Informatics and Design* degree program, addressing the need for interdisciplinarity, adaptability to technological change, and employability in higher education. Fully implemented in regular teaching, the curriculum is centered on project-based learning (PBL), with large-scale team projects serving as the primary learning environment from the very first semester. Curricular coherence and agility are achieved through a modular architecture consisting of foundational START modules, project-aligned intensive PRIMER blocks, flexible Learning Units, and a structured reflection layer. This framework provides targeted competencies within the project workflow while connecting practical application with critical reflection on ecological, social, and economic sustainability. The paper presents a transferable model demonstrating how modular, project-based structures can substantially enhance interdisciplinary collaboration and practical relevance in contemporary higher education.

Keywords: *Curriculum design, project-based learning, practice-oriented pedagogy, modular curriculum, flexible learning units.*

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"I CAN ACHIEVE ALMOST ANYTHING": HIGHER EDUCATION EXPERIENCES OF YOUNG ADULTS WITH CARE EXPERIENCE IN IRELAND

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Abstract
International literature suggests that young people with care experience typically have lower educational attainment and reduced progression rates to higher education compared to their majority-population peers (McNamara et al., 2017; Sebbaet al., 2015; Stone, 2007; Trout et al., 2008; Brady et al., 2019). The experience of growing up in state care was only formally recognised in 2022 by the Irish Higher Education Authority (2022) as a life situation associated with social disadvantage, warranting strategic priority for providing increasing access opportunities to higher education. To date, there has been a reliance on anecdotal evidence to understand the higher education trajectories of care-experienced people in Ireland. This oral paper presents research from a funded report that addresses this paucity of primary research. It explores the enablers and challenges faced by care-experienced students in Irish higher education, highlighting the need for enhanced support services and data collection to improve their educational outcomes. A mixed method approach was adopted in this study with fieldwork taking place between November 2023 and February 2024 using three methods: a) A focus group with eight Access Practitioners with experience of working with care-experienced students in participating Irish universities; b) 48 responses to an online survey distributed to all students in participating HEIs and; c) Semi-structured individual interviews with four care-experienced university students using photo-voice. Our research suggested that while care-experienced students share similar aspirations with other students about attending higher education (such as pursuing a career), they are also influenced by their care experience. Some reported being guided by pragmatic reasons such as the eligibility requirement to be in full-time education to receive state financial allowances. Other key findings suggest that managing transitions – from care to independent living, and from school to higher education – is a significant challenge for care-experienced students. While they can feel belonging in university, participants sometimes prioritise external factors (e.g. caring responsibilities) over their academic achievement. Pivotal to their academic success appears to be the quality of the working relationship between the student, the child protection services and university access practitioners. The paper concludes with policy and practice recommendations, calling for sustained 'care-aware' university-based access and retention services.

Keywords: *Foster care, care-experience, access, educational attainment, peer support.*

MENTORS AS LEARNERS: SOCIAL COMPETENCY DEVELOPMENT IN REVERSE MENTORING

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Abstract
Reverse mentoring is increasingly recognized as a mentoring model that promotes reciprocal learning and intergenerational knowledge exchange. This study explores the development of mentors' social competencies within reverse mentoring using a qualitative research approach grounded in social constructivism. Data collected through semi-structured interviews revealed that reverse mentoring contributes to the development of communication, empathy, self-awareness, active listening, and conflict resolution skills. The findings also highlight the importance of trust-based relationships, open communication, adaptability, and mutual respect in supporting both professional interaction and personal growth. Overall, the study positions reverse mentoring as a meaningful context for the development of mentors' social competencies in contemporary professional environments.

Keywords: *Reverse mentoring, social competencies, mentor development, intergenerational learning.*

MATERIAL DEVELOPMENT AS COLLABORATIVE PRACTICE: INSIGHTS FROM ENGLISH TEACHERS IN OMAN

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Abstract
Material development is a core component of English language teaching, yet it is often conceptualized as an individual activity. This study reconceptualizes material development as a collaborative and socially mediated practice, exploring how English teachers in Oman design, adapt, and share teaching materials within professional communities. Using a qualitative design, data were collected through in-depth interviews with nine experienced English teachers across Grades 1–12 in Omani public schools. Findings reveal that teachers engage in material development through dynamic professional communities that operate across both formal and informal spaces. School-based collaboration, including mentoring, peer review, and critical friendships, is complemented by digitally mediated networks such as WhatsApp groups, shared drives, and social media platforms. These communities function not only as channels for resource exchange but also as sites of reflection, innovation, and professional learning, enabling teachers to co-construct materials, introduce new tools, and refine their practices. Collaboration was found to reduce workload, enhance consistency, and support creativity, while also fostering teachers' professional identity, sense of responsibility, and ethical awareness regarding sharing practices. The findings further highlight that material development is closely linked to teachers' professional growth. Participation in collaborative networks encourages reflective practice, supports continuous learning, and shapes how teachers position themselves as knowledgeable and resourceful practitioners. At the same time, tensions related to recognition, ownership, and uneven participation reveal the complex social dynamics underlying collaborative work. In addition, experienced teachers emphasized the importance of mentorship, self-directed learning, and responsiveness to students' needs in guiding novice teachers' engagement with material development. Overall, the study positions material development as a multidimensional, collaborative, and identity-forming process, shaped by social interaction, digital connectivity, and contextual awareness. It underscores the need for fostering structured professional communities and providing targeted support to enhance collaborative practices and sustain innovation in teaching materials. The study contributes to understanding how collaboration and professional networks can strengthen both the quality of instructional materials and teachers' professional development in the Omani context.

Keywords: *Material development, collaborative practice, professional communities, teacher identity, English Language Teaching (ELT), Oman.*

PARTICIPATION, AGENCY AND WELL-BEING: TOWARDS A DEMOCRATIC VISION OF SCHOOLING

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Abstract
International educational debate increasingly highlights the urgency of adopting a holistic vision of education capable of integrating well-being, inclusion, and democratic citizenship (OCSE, 2018; UNESCO, 2014). These dimensions, closely connected to learning and educational success - particularly for students in situations of vulnerability (OCSE, 2018) - call for a profound rethinking of the traditional school model, which often remains characterized by transmissive practices and hierarchical relationships. Although many schools formally provide opportunities for representation and participation, these frequently remain ritualistic or symbolic, offering limited possibilities for students to exercise genuine agency or to meaningfully influence educational processes. This contribution explores the relationship between participation, agency, and well-being through the research project "The School is Us!" (2023–2025), conducted in secondary schools in Milan. Grounded in the Student Voice approach (Cook-Sather, 2006; Fielding, 2004; Mitra, 2008), the study conceptualizes students as epistemic agents and co-constructors of educational meaning, emphasizing that authentic participation represents a generative condition for both well-being and a sense of belonging. The project investigates the transformative potential of student voice and participatory research practices in fostering more democratic and relational school environments

(Pastori & Pagani, 2025). In its first phase, an explanatory sequential mixed-methods design (Creswell & Plano Clark, 2007) combined a survey on school climate, student voice, and participation (2023-2024) with eleven focus groups aimed at deepening students' experiences of recognition, influence, and marginalization. In the second phase (2024-2025), mixed groups of students and teachers engaged in participatory research pathways to co-develop and experiment with proposals for school improvement, progressively transforming the project into a laboratory of democratic practice. Findings suggest that school well-being should be understood not only as an outcome but also as a driver of participation: when students are genuinely listened to and recognized as competent subjects, motivation increases, a stronger sense of belonging develops, and the school can regenerate itself as a relational and democratic community. Building on these insights, the paper discusses the implications of participatory and student-centered practices for the professional role of teachers, highlighting their key responsibility in creating dialogic learning environments, supporting students' agency, and fostering classroom conditions that sustain both participation and well-being.

Keywords: *Student voice, mixed-methods, well-being, students' agency, participation.*

EXPERIENTIAL EDUCATION FOR YOUTH: EXPANDING OPPORTUNITIES BEYOND THE CLASSROOM

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Abstract
Cooperative learning education, a type of experiential learning, has emerged as an approach taken up by secondary schools to connect students' classroom learning to future employment opportunities. The cooperative learning model provides students the opportunity to take the knowledge and skills acquired at school and apply their learning in real life workplace settings. Our study focused on understanding the experiences of secondary students enrolled in cooperative learning programming and to determine the most essential supports and the challenges impacting effective implementation. The question guiding the study was: How can cooperative learning education be structured to maximize learning, engagement, and preparedness for future employment? Kolb's (1984) experiential learning theory, a four-stage cyclical model that validates learning through doing, served as the study's theoretical framework. Drawing upon the interview and focus group data, taken from a larger year-long mixed-methods research study, this study focused on understanding students' experiences associated with their engagement with cooperative learning programming. Our participants included over 60 secondary school students residing in eight different rural and urban communities located in Eastern Canada. Our use of a thematic data analysis approach involved organizing, reading, and coding data that led us to develop sub- and central themes. These themes were supported by participants' quotations and related research literature. The central themes that emerged include: structured learning supports, employability skill development, career choice and preparation, coaching and guidance, and accessibility. Participants identified how the structured program and supports provided during their cooperative learning experience helped them develop self-confidence, clarify their interests, and acquire career-related competencies. We offer recommendations for schools and jurisdictions to strengthen their implementation of cooperative learning programming that includes ensuring strategic planning related to program design, scaffolding career development learning supports, and emphasizing the value of fostering employability skills. Such practices may enable secondary schools to offer students post-graduation preparation that more effectively support students' transitions into the world of work.

Keywords: *Experiential learning, co-op education, career, employability skills.*

INITIAL JOINT QUALIFICATION TRAINING: ONE PATH, TWO IDENTITIES?

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Abstract
This paper presents a qualitative investigation into how a joint professional qualification—the Master's Degree in Preschool Education and Primary Education, implemented within the Portuguese framework for initial teacher training—shapes the professional identity of beginning teachers. Situated within broader European policy reforms, the programme qualifies graduates to teach both in Preschool Education and Primary Education, raising important questions about how a single training pathway contributes to the development of two distinct yet interconnected professional identities. Drawing on interviews with graduates who have experienced teaching in both levels, complemented by documentary analysis, the study explores the influence of initial teacher education on processes of professional socialisation, curriculum interpretation, and the articulation of personal and pedagogical values. The findings reveal that the dual qualification fosters a flexible, holistic and relational professional identity, even as graduates navigate tensions arising from contrasting curricular and developmental expectations. The study concludes that joint qualification can contribute to integrated identity development when supported by coherent practicum experiences and sustained reflective practice, offering important implications for programme design and educational policy.

Keywords: *Initial teacher education, joint qualification, professional identity, early childhood education, primary education.*

UNDERSTANDING FINANCIAL ERRORS OF YOUNG ADULTS: DEFINING ERRORS AND INITIAL FINDINGS FROM AN INTERVIEW STUDY

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Abstract
Errors in financial contexts can have far-reaching consequences. Young adults, in particular, are vulnerable to making financial decisions that later prove to be unfavorable due to insufficient financial competence (Bucher-Koenen & Knebel, 2021; Fürstenau et al., 2020; Lusardi & Mitchell, 2023; OECD/INFE, 2023). As financial socialization processes during this life phase are especially influential for subsequent financial behavior, it is worthwhile to examine potential errors (Shim et al., 2010). This, in turn, enables the development of targeted support measures. Accordingly, the aim of this presentation is to identify the types of errors young adults make in financial contexts. Unlike many other domains, such as accounting, language conventions, or mathematics, there is no universally accepted definition of error in financial contexts (cf. Seifried et al., 2010; Bauer et al., 2004). This is largely due to the absence of a clear norm distinguishing "right" from "wrong" decisions. Whether a particular action constitutes an error therefore always depends on situational factors (Oser et al., 1999). Nevertheless, a clear definition is essential in order to identify, model, and systematically examine errors in financial contexts. As a first step, an error definition was developed that takes into account relevant literature (Borgwart, 2010; Frese & Zapf, 1991; Metcalfe, 2017) as well as the specific characteristics of financial decision-making. In this definition, the avoidability of a situation or an incorrect decision plays a particularly important role (Wehner, 1992; Zhao & Olivera, 2006), while simultaneously considering the circumstances under which the decision was made (Sauerland, 2024). The resulting definition provides the basis for objective and valid data collection in the interview study. To identify errors, approximately 30 semi-structured interviews with young adults and 30 semi-structured interviews with experts were conducted. Using the Critical Incident Technique, the study aims to collect as much information as possible about common errors (cf. Flanagan, 1954). Typical errors are subsequently identified through inductive–deductive content analysis. Initial findings indicate that typical errors occur across various domains of financial literacy, including investing, saving, budgeting, retirement planning, and insurance.

Keywords: *Financial literacy, financial error, financial decision, young adults, error research.*

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THE GOAL: REFLECTIVE PRACTITIONER – THE PATH: BUMPY! WHICH PERSONALITY TRAITS SHOULD BE CONSIDERED AND DISCUSSED?

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Abstract
Referring to Weinert's concept of competence (2003), reflection competence requires cognitive abilities and skills for the analysis of pedagogical practice as well as motivation and volition. In 2017/18, we surveyed 178 student teachers at the University of Bremen. Participants were asked to analyze pedagogical vignettes after self-assessing their reflection competence. Across all dimensions of reflection, a floor effect emerged—contrary to their self-assessments. To identify relevant explanatory variables, a follow-up study conducted in 2018 examined whether reflection competence depends on personality traits and cognitive capabilities. The guiding objective was to explore how cognitive abilities and personality traits, such as dominance and tolerance of ambiguity, influence reflective processes. In the follow-up study, 90 student teachers participated. Standardized instruments were used for empirical data collection: the Personality Research Form (PRF) to assess personality traits such as dominance, the Inventory for Measuring Ambiguity Tolerance (IMA) to assess tolerance of ambiguity in conflict situations, and the Cognitive Ability Test (LPS-2). Selected findings indicate that dominance corresponded to stanine 6.7. In particular, tolerance of ambiguity regarding conflicts was very low (M = 2.74, SD = 1.99). Across all measured abilities, the average intelligence quotient was M = 96.5 (SD = 15.5). Furthermore, the surveyed students exhibited a comparatively high degree of dominance while simultaneously displaying low tolerance of ambiguity in conflict situations. The findings raise several questions worthy of further discussion: To what extent is a profile characterized by high dominance combined with low tolerance of ambiguity conducive to effective professional practice in educational settings? To what extent do these findings challenge the assumptions associated with the concept of the reflective practitioner?

Keywords: *Professionalization of student teachers, reflective practioner, intelligence, personality traits.*

WELL-BEING AT WORK FROM THE PERSPECTIVE OF DIVERSE GENERATIONS (BABY BOOMERS, X, Y, Z) AND OCCUPATIONAL GROUPS

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Abstract
This paper aims to identify differences in the understanding and priorities of well-being among different generations and representatives of diverse professional groups. The study aims to answer the question: How do priorities regarding well-being at work differ depending on age and professional experience, i.e., generational affiliation and job type? Are there significant differences in the perception of the hierarchy of well-being priorities among representatives of Generations BB, X, Y, and Z, who function as academic teachers, managers, and professionals? The study participants were a group of 137 individuals, composed of representatives of diverse generations (BB, X, Y, and Z), all with higher education. In the next part of the study, in-depth interviews were used. A total of 48 individuals participated from the group described above, 12 representatives of each generation, and three from each professional activity. All participants had higher education and represented diverse professions: academic teachers, management staff, and professionals employed in independent positions, four from each professional group. The added value of this article is its comprehensive overview and generational breakdown of representatives of specific professions, addressing significant priorities in their lives related to well-being, which has not previously appeared in the literature, and its emphasis on the application value of the research findings. It can be expected that stereotypical opinions about the preferences of representatives of specific generations hinder the realization of their potential, particularly in relation to Generation Z graduates.

Keywords: *Well-being, generations, academic teachers, managers, professionals.*

THE IMPACT A WORLD CAFÉ APPROACH HAS ON LEARNING OUTCOMES IN A QUANTITATIVE CLASS

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Abstract
Action research stems from engagement, which involves forming collaborative relationships and dialogue among participants. Conducting a World Café provides an opportunity for increased engagement in collaborative group discussions. The BSc Applied Economics programme is a new programme that combines the theory and application of economics with personal and professional development. The development of interpersonal skills in tandem with discipline-specific knowledge and skills supports students' awareness, understanding and knowledge of the subject. Generally, economics students tend to have a negative attitude towards quantitative techniques. Therefore, this study examines the impact the World Café approach has on student learning outcomes in a quantitative class. For this research, a World Café was delivered to first-year economics students in EC1112 Economic Data as Evidence (n=15) at the end of semester 2 (January to May) 2024. The research design adopted a qualitative approach to capture the impact the World Café event had on learning outcomes. A World Café fosters collaborative learning, sharing ideas, discussion and collective learning around a pre-arranged structured set of questions or a case study. The case study was a hypothetical grant application for a small village to upgrade local services and amenities. Incorporating case studies using real-life applications is a recommended pedagogical tool. Students were assigned three tasks at each table based on the module learning outcomes. These tasks included: the construction and development of a survey for the collection of primary data, analysis of secondary data sources and application of different types of methodologies to the data. Learning outcomes were evident in the qualitative feedback. Reassuringly, students highlighted project-specific learning outcomes. "*Conveying and displaying figures and data to represent the economic state of the market"*, "*I understand economic data as evidence, as using economics to gather relevant data ……which can be used to advance understanding of the discipline".* They recognised the importance of evidence, but the link with economic decision-making was not as evident "*I realised I knew more than I learnt, ……There is a benefit of looking back on what you've learnt".* Feedback was positive, but an enquiry-based pedagogy with 'real world' relevance is needed, as it ensures 'buy-in' from students. The inclusion of an action research approach, complemented with a case study in a quantitative class, supports the development of well-rounded business graduates by linking quantitative analysis with practical decision-making and applied learning.

Keywords: *Action research, learning outcomes. economics of education.*

TEACHERS' EXPERIENCES WITH DIFFERENTIATED LEARNING MATERIALS: PAPER VS DIGITAL FORMATS

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Abstract
Differentiated instruction enables teachers to apply flexible approaches that address students' diversity. Typically, four dimensions frame its implementation: content, process, product, and learning environment. In this study, 8th grade mathematics teachers (n = 11) used differentiated learning materials on paper and in digital format for approximately 2 months within the topic of polynomials. The aim of the study was to explore the use of differentiated materials in 8th grade mathematics, focusing on how their format shapes teaching practices and students' learning. Semi-structured interviews were applied to gain deeper insight into how differentiation was implemented. Inductive qualitative content analysis revealed that although the materials were primarily differentiated toward an easier level, teachers actively used them with all students in both, paper and digital groups. A new topic was often introduced using the differentiated materials, working with step-by-step approach, discussing examples, and then practicing new skills according to students' individual level. Students with learning difficulties kept using the differentiated materials, while other students switched between traditional textbooks. Teachers did not perceive major changes to their

usual teaching methods, instead they emphasized a positive opportunity to vary levels and apply step-by-step approach more easily. The differences between format became more visible in regard to perceived changes in students' motivation and knowledge. Paper group teachers described increased motivation, while digital group emphasized knowledge change. In conclusion, the study suggests that differentiated materials can be effectively integrated into whole-class instruction rather than limit to students with learning difficulties, while not causing extra workload or major changes to teachers' regular practice.

Keywords: *Differentiation, differentiated instruction, mathematics, secondary school, algebra.*

MATERNAL CONTROL AND PERCEIVED SUPPORT IN CHILDBIRTH: PERINATAL MENTAL HEALTH IN NURSING DEGREE IS MANDATORY

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Abstract
Background: The perinatal period is a time of high vulnerability for maternal mental health, during which mental health disorders such as anxiety, postpartum depression (PPD), postpartum post-traumatic stress disorder (PTSD), and suicide risk may appear. The perception of maternal control and support during childbirth significantly influences the maternal birth experience and the risk of developing these conditions. Considering the high prevalence and impact of these issues, it is crucial that future healthcare professionals, receive specialized training. The integration of a module on Perinatal Mental Health in the Nursing curriculum is paramount to ensure comprehensive care and early detection of these risks. *Objective:* To analyze the influence of perceived control and support during childbirth on maternal perinatal mental health establishing the need and justification for incorporating a mandatory Perinatal Mental Health module in the University Degree in Nursing to optimize early detection and intervention. *Method:* A cross-sectional study was conducted with 302 postpartum women in Spain. Support and Control in Birth Scale (SCIB) assessed the degree of support and control; Perinatal Post-traumatic Stress Disorder Questionnaire (PPQ) measured PTSD; Edinburgh Postnatal Depression Scale (EPDS) identified PPD; Generalized Anxiety Disorder (GAD-7) assessed anxiety; and Paykel scale estimated suicide risk. Bivariate and multivariate analyses were performed using logistic regression, estimating odds ratios (OR) and adjusted odds ratios (aOR) and 95% confidence intervals. *Results:* High scores on the SCIB were a significant protective factor against PTSD (aOR=0.97; 95% CI: 0.96–0.99). Failure to adhere to the birth plan increased the risk (aOR=3.11; 95% CI: 1.23–7.89). Multiparity acted as a protective factor (aOR=0.32; 95% CI: 0.13–0.80), while early initiation of breastfeeding also reduced the risk (aOR=0.37; 95% CI: 0.18–0.78). Conversely, health problems during pregnancy increased the likelihood of developing PTSD symptoms (aOR=2.03; 95% CI: 1.00–4.12). No significant associations were found between SCIB scores and the risk of suicide, PPD, or anxiety. *Conclusions:* Maternal perceived control and support during childbirth are key determinants in the development of PTSD, showing a protective effect. Promoting respectful birth experiences, centered on maternal autonomy, communication, and emotional support, is vital for public health. Given these findings, it is absolutely necessary to strengthen the academic preparation of future nursing professionals. The implementation of a Perinatal Mental Health module in the Nursing University Degree is justified to equip nurses with the essential skills for early detection, comprehensive management, and promotion of psychologically safe birth environments.

Keywords: *Perinatal mental health, birth control and support, Postpartum Posttraumatic Stress Disorder (PTSD), birth experience, Spanish postpartum women.*

BUILT ENVIRONMENT EDUCATION AND PROJECT-BASED LEARNING THROUGH COLLABORATION BETWEEN FORMAL AND NON-FORMAL EDUCATORS

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Abstract
Current educational debates increasingly emphasise creativity, critical thinking, collaboration, student agency and real-world problem solving. Yet schools and teachers are often expected to address these aims within fragmented timetables, subject-based curricula and limited institutional capacity. This paper examines how Built Environment Education and Project-Based Learning can respond to this tension by connecting learning to the places students use every day. The paper asks what Built Environment Education adds to Project-Based Learning when the built environment becomes the object of inquiry, and what forms of collaboration between formal educators and non-formal built-environment educators support the application of such learning in schools. It develops a practice-informed conceptual framework by connecting literature on Project-Based Learning, principles and repositories from Built Environment Education, and school-based pilot experiences in which students observed, mapped, discussed and proposed improvements to their learning environments. The paper argues that Built Environment Education adds specific value to Project-Based Learning because students engage with classrooms, corridors, schoolyards, streets and neighbourhoods as places that shape inclusion, sustainability, safety, belonging and civic participation. Non-formal built-environment educators can support this process by bringing spatial expertise, design methods, facilitation skills and commitment to real-world learning. The conclusion is that co-curricular and extracurricular collaboration should not be understood as marginal to school education. It can act as a practical gateway for introducing place-based, project-based and collaborative learning into everyday school life. Beyond Built Environment Education, the paper also points to a broader approach: schools may need structured collaboration with external educational actors in order to make real-world learning more applicable, sustained and socially meaningful.

Keywords: *Built environment education, project-based learning, place-based learning, formal–non-formal educator collaboration, student agency.*

THE GENAI DIVIDE: HOW STUDENTS VS. FACULTY PERCEIVE GENERATIVE AI INTEGRATION IN HIGHER EDUCATION

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Abstract
Introduction: This study explores the integration of Generative Artificial Intelligence (GenAI) in higher education by comparing students' and faculty members' uses, perceptions, and perceived values of GenAI tools. Conducted at a leading technological institute in the Middle East during the 2024–2025 academic year, the research is grounded in Expectancy Value Theory (EVT), providing a multidimensional framework: functional, economic, psychological, and hedonic value to explain GenAI adoption. *Methodology:* Data were collected via two parallel online surveys distributed to all students and academic faculty, yielding 769 student responses (13% response rate) and 184 faculty responses (28%). *Results:* Findings reveal a widespread integration of GenAI tools: 94% of students and 80% of faculty use them for academic purposes. Despite this high level of adoption, clear differences emerged between the groups regarding how and why they use GenAI. Students primarily employ GenAI tools as personal tutors, particularly for clarifying difficult concepts (M=4.18) and deepening understanding (M=3.66), while faculty perceive student use as focused on productive tasks such as writing academic papers (M=4.11) and summarizing materials (M=3.61). Factor analysis confirmed these two dimensions of GenAI use, "Productive Tool" and "Personal Tutor," highlighting distinct conceptualizations of GenAI's educational role. Perceived value analysis revealed that students attribute higher functional value to GenAI (M=4.09) than faculty (M=3.60), emphasizing its utility in enhancing learning and performance. Conversely, faculty rated the psychological value significantly higher (M=3.76 vs. M=3.45), viewing GenAI as a tool that

enhances confidence and efficiency for teaching and research. Both groups recognized the economic and hedonic benefits of GenAI tools, primarily through time-saving and increased engagement. *Discussion:* The findings demonstrate a clear and rapid integration of GenAI tools into the routine of learning, teaching, and research for both students and faculty. This situation underscores the urgent need to develop an institutional strategy that addresses the needs arising from the field, including training and establishing ethical guidelines. The insights gained from this research contribute to the ongoing dialogue on the role of GenAI in higher education and provide evidence-based recommendations for its responsible implementation in academia.

Keywords: *GenAI, higher education, teaching and learning, expectancy value theory, perceptions.*

ACT-SAT1

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Abstract
Adaptive communication technologies Satellite (ACT-Sat1), is a mission that will utilize a Blank-Slate AI with the goal of maximizing the communications system on board a CubeSat. CubeSat communication systems have to deal with a multitude of restrictions including strict power, bandwidth, and link budget constraints. Right now, systems are set to deal with an ideal, unchanging situation. This is where AI comes into play; by training a blank-slate AI to adapt on-board systems to maximize communication efficiency. ACT-Sat1 will change the specific restrictions in place for a communication system to determine the most efficient settings at different points in orbit. This system will lead to increased downlink efficiency, reduced power waste, and improved autonomy and operational lifespan. The benefit of maximizing downlink efficiency is a reduced operational cost for groundstations due to less total passes. This kind of system could reduce the total operational cost of a CubeSat by around 20-40%. If this mission proves to be successful with the communication system, it could open the door to maximizing other systems on board a CubeSat like EPS, thermal management, and ADCS. In order to train the AI model, it will be given a set of radio telemetry data as well as a description of its effects on the CubeSat. These will include SNR, BER, RSSI, etc. The AI will also be given a list of values it can change during different scenarios such as transmitter power, bandwidth, and SDR gain settings. The AI will be given rewards for certain actions to encourage effective behavior. The system will then be put through a simulator where it will encounter different real-life scenarios and learn what improves the communications. The AI will be housed in a Raspberry Pi Compute Module 4 (CM4) due to its compact build and ideal power usage at .5 to 1 watt. Even if ideal conditions are not met in space this model will peak at 5 watts. Due to the fact that the AI will only be running during downlink this is a very manageable wattage to meet. The CM4 would then be connected to an OBC, but since they are separate boards, if the AI stops working, the satellite can still function which means we can still deorbit the CubeSat safely. Additionally, if the AI stops responding the OBC can acknowledge that and power cycle the AI to getting back up and running.

Keywords: *CubeSat communications, artificial intelligence, downlink efficiency, autonomous satellite systems, CubeSat cost reduction.*

HOME ECONOMICS IN EUROPEAN PUBLIC SCHOOL CURRICULA: A COMPARATIVE MAPPING AND IMPLICATIONS FOR END 2026

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Abstract
The SHAREE (STE(A)M for Home Economics and Research Exchange) project is a pan European collaborative project between Tallinn University, the University of Helsinki and Atlantic Technological University, Ireland. The project was awarded funding under the European Union's Horizon Europe widening participation and spreading excellence sub-programme. One of the key outputs of the SHAREE project was to research and map how the curricular subject Home Economics exists in European public school curricula. This work involved mapping countries where Home Economics is taught in public school systems and providing country-specific details regarding curriculum specification and topics based on findings related to existing international curricula, syllabi, and educational policy. A summary of that research output is shared in this paper and in the END Conference Oral Presentation. A full report on Home Economics in European Public School Curricula, with specific individual country breakdown, is also available to review (Nõmmik et al., 2025). The objective of this paper is to synthesise country-level curriculum positions and common topic emphases from the overall report to inform END Conference 2026. Documentary evidence regarding European Home Economics syllabi, national curricula, and education systems was collected in spring–summer 2025 laws, obtained by the researchers through online sources and local contacts. The collected information was analysed and synthesised thematically employing the unifying lens of the International Federation for Home Economics position statement (2008) as a frame. Outcomes indicate that Home Economics as a curricular subject is present (compulsory or elective; standalone or integrated) in 24 of 44 European public school systems reviewed; Nordic countries typically offer standalone, compulsory HE with strong sustainability/well-being orientation, while many Central/Eastern systems integrate HE into Technology/Design. Core topics which are commonly included in the curricular subject across countries/systems include food preparation, nutrition/health, consumer education, textiles, and household management, with some variability evident between curricula in depth of content treatment and emphasis. Despite structural differences, Home Economics Curricula across Europe consistently aim to build essential life skills and civic/sustainability competencies amongst students. Further future harmonisation of subject indicators and cross-country collaboration could serve to strengthen visibility, subject recognition and more strongly severe related policy enhancement.

Keywords: *Home economics, curriculum, mapping, Europe, life skills.*

DOES MORE TEACHING EXPERIENCE MEAN MORE EXPERTISE? A NONLINEAR PERSPECTIVE FROM THE COACTIV STUDY

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Abstract
In expert–novice research paradigms on the teaching profession, the length of experience is—despite many warnings—used quite often as a key criterion for assigning teachers to the expert group. In the presentation we aim to empirically answer the question of whether it is a valid option to rely on experience when looking for expert teachers. Using data from the German COACTIV project ("Professional Competence of Teachers, Cognitively Activating Instruction, and the Development of Students' Mathematical Literacy") – a study on the professional competence of mathematics teachers of PISA classes ("Program for International Student Assessment") with more than 1000 variables regarding teachers, their lessons, and their students (Krauss et al., 2025) – we analyzed the relationship between 13 expertise indicators and length of experience (i.e., years of teaching). In doing so, we empirically considered the following 13 expertise indicators of German mathematics teachers that were measured in the COACTIV study: the professional competence aspects of (1) content knowledge, (2) pedagogical content knowledge, (3) constructivist beliefs, (4) enthusiasm, and (5) job satisfaction; the two situations-specific skills

(6) methodological action competence and (7) subject-specific action competence; the three basic dimensions of instructional quality (8) cognitive activation, (9) constructive individual learning support, and (10) classroom management; the two student emotions of (11) experienced enjoyment and (12) experienced anxiety (negatively pooled) as well as (13) the mathematical learning gains of students. Interestingly, these expertise indicators are not independent but correlate with each other: By ordering all COACTIV teachers regarding each of the 13 indicators and considering the median rank of a teacher according to these indicators, we were able to form an overall expertise (OE) index. When modeling linear correlations, the 13 indicators as well as the OE index surprisingly showed negative or zero correlations with length of experience. When allowing for nonlinear models, we identified slight differential relationships between years of teaching and OE within three distinct intervals: a positive relation during the first 8 years of teaching, a negative relation in midcareer, and again a positive relation in the last 10–15 years. Similar curves also emerged in subsamples (academic- vs. vocational-track teachers). We discuss these findings in light of the cross-sectional nature of the COACTIV data. Our results call into question if long experience is a sufficient condition for becoming an expert teacher but strikingly also contradict the widely held view that professional experience is a necessary condition.

Keywords: *COACTIV, teacher, professional competence, expertise, experience.*

GAMING: AN EFFECTIVE APPROACH FOR BUILT ENVIRONMENT EDUCATION

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Abstract
Numerous studies have stressed the importance of gaming for all age groups, including better memory and problem-solving to improved mood and social skills. Games are also to unwind and relax. Games also lead to bouts of laughter that stimulate endorphins. This simple act of having fun can help boost serotonin, relieve anxiety, and increase enthusiasm in other areas and walks of life. Games include board games (tabletop games), body-space games, video games, mind games, and others. Can games be an educational tool? This paper argues that gaming is a powerful tool for teaching children about life in general, and about the built environment in particular. Hence, the structure of the paper revolves around a few main ensuing questions: What are the skills and knowledge foundation that BEE brings and develops? How does gaming affect children, what does it convey, and what does it tackle? Is it possible, then, to create and design BEE games? Who is legible to design them? In what context? Are there any reliable examples? Can we generalize BEE games (and any other BEE "edutainment" tools and kits) for other age groups and societal sects? The methodology, therefor, is based on a quick review of literature pertaining to the ultimate skills and knowledge offered by built environment education to children and youth. Then, the paper moves to highlighting games and gaming as an effective educational tool. Following, is a review of some examples of BEE games from Egypt, designed and demonstrated for the local (Egyptian) Golden Cubes Awards over a ten years' time, in addition to a few examples designed and examined by students of architecture as assignments in specific history and theories undergraduate courses in an Egyptian University. While discussing the impact of applying the games requires further research, nevertheless, showcasing the designed and applied games examples revealed an opportunity for a new approach of built environment education, that can be practiced in schools, at home or in true settings. It also paves the way ahead of a better collaboration between school education and architectural academia, BEE providers and students of architecture, and the community at large.

Keywords: *Built Environment Education, gaming, games, educational approaches, architecture and children.*

INVESTIGATING TRAUMA IN UNDERGRADUATE COUNSELING STUDENTS

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Abstract
In the realm of counseling education, a growing concern has emerged surrounding the prevalence of high levels of trauma experienced by students within the field. Referred to as "wounded healers," these individuals navigate the delicate balance of helping others while grappling with their own treated and/or unresolved trauma. This presentation aims to shed light on the intricate interplay between personal trauma and the pursuit of a counseling career, exploring the unique challenges and opportunities that arise for these aspiring healers. This discussion will examine the diverse forms of trauma that counseling students may experience throughout their academic training and personal lives, as well as the effects of these experiences on their professional development. Particular attention will be given to the implications for student well-being, academic functioning, and the subsequent quality and effectiveness of future counseling practice. Additionally, the presenters will provide data from their research conducted with undergraduate students from different academic departments, in which they report historical and current trauma they are experiencing. The data will provide insight into the prevalence of different types of trauma among the university students studied. Data will also be shared regarding the frequency with which participants sought mental health treatment. Furthermore, this presentation will examine evidence-informed strategies and institutional support mechanisms that may be integrated into counseling education programs to promote resilience and self-awareness among emerging practitioners. By systematically recognizing and addressing the vulnerabilities associated with the wounded healer phenomenon, counseling programs can strengthen professional competency, improve the quality of mental health service delivery, and foster a professional culture that emphasizes compassion, empathy, and sustainable self-care practices.

Keywords: *Trauma, counseling, undergraduate, wounded healer.*

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PROJECTS AND TRENDS

GATHERING CONTENT VALIDITY EVIDENCE FOR A MATHEMATICS AND STATISTICS DIAGNOSTIC TOOL USING QUALITATIVE METHODOLOGY

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Abstract
Competence in mathematics represents an ongoing challenge for higher education institutions, particularly as universities face evolving educational policies that espouse principles of competence-based education. This means it is crucial to ensure incoming students have adequate mathematical and statistical foundations for academic success across a wide range of disciplines. Unfortunately, very few standardized diagnostic instruments currently exist to measure the mathematical readiness of entering students or to identify learning gaps that could lead to failure at an early stage of their university trajectory. The present study was developed within the framework of the DiagnosticaMATH Innovation Project, whose main aim is to create a standardized diagnostic instrument to measure the mathematical and statistical cross-cutting competence of Spanish students at the moment of entering university, and to evaluate their evolution during the years of study. The present work describes the first phase of this project, which consists of obtaining validity evidence based on test content through qualitative methodology. To this end, three discussion groups were formed with experts in mathematics education and evaluation, until saturation of the proposed themes was reached. The analysis leads to three principal results: a) a single test can hardly evaluate specific mathematical skills, but a diagnostic task could be constructed through problem solving situations involving metacognitive processes; b) comprehension is a key transversal competence, which critically affects mathematical performance; c) while the pre-university education of the students offers a sufficient base of knowledge, it is generally procedural and superficial, depending little on flexible capacity for problem solving.

Keywords: *Mathematics diagnostic test, competencies, pre-university mathematics, standard test.*

REIMAGINING ASSESSMENT: AI-DRIVEN STRATEGIES FOR TRANSFORMING TEACHER EDUCATION

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Abstract
This paper presents findings from a research project investigating innovative curriculum-based assessment models that integrate Generative AI tools into pre-service teacher education. Engaging over 700 students across diverse teaching programs, the study explored how future educators experiment with, adapt, and critically evaluate the use of Generative AI in classroom and applied learning contexts. Students documented their AI usage, provided critical justification, and reflected on their experiences through structured assignment responses. Key findings reveal that when critically embedded into assessment design, Generative AI can significantly enhance students' confidence, digital literacy, and pedagogical adaptability. The process of monitoring and reflecting on AI use fostered deeper critical engagement and ethical awareness. Importantly, the study highlights the role of educative assessment redesign in transforming teacher preparation, positioning AI not as a threat but as a pedagogical partner. Implications for higher education include the need for robust assurance frameworks to manage AI-integrated assessments, professional development for educators, and policy guidance to support ethical and effective AI use. The paper concludes with recommendations for sustaining the integration of emerging AI technologies in teacher education, ensuring alignment with both academic integrity and future classroom realities.

Keywords: *Generative AI, assessment, academic support, AI pedagogies.*

GROWING SKILLS AND INCLUSION WITH A HYDROPONIC ORCHARD

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Abstract
The participation of individuals with intellectual disabilities in higher education has traditionally been limited. However, this situation is gradually evolving due to the growing number of university programmes designed to foster their educational and social inclusion. At the University of A Coruña, the initiative "Espazo Compartido" offers an educational pathway focused on developing personal, social, digital, and pre-employment skills essential for autonomy and employability. Within this context, the use of horticultural activities is proposed as an active pedagogical resource, given its proven effectiveness in enhancing mental health, promoting social inclusion, and stimulating cognitive functions through plant cultivation and participation in structured activities. This proposal has been implemented in the TICARE project (Application of High Technology in Centers for the Care of Individuals with Intellectual Disabilities), which aims to innovate therapeutic and educational interventions through the integration of technology in the Centers for the Care of Individuals with Disabilities (CAPD) in Galicia. The HATHOR subproject (inaugurated in April 2025 at the CAPD in Coruña) consists of an indoor therapeutic orchard based on a closed hydroponic system, automated through home automation technologies, sensor networks, and remote control. The system is designed in accordance with universal accessibility principles and incorporates an interface adapted to the specific needs of individuals with intellectual disabilities, following established recommendations. It enables users to perform tasks such as watering, fertilizing, or activating the cooling system in a simple, intuitive, and safe manner—both on-site and remotely. In addition, the system supports continuous monitoring of the orchard's condition, tracking crop development, and automatic logging of horticultural activities and incidents. All this allows the garden to be semi-automated and for students to acquire basic digital skills. Manual tasks, such as pruning or harvesting, are carried out with the help of therapists and in compliance with accessibility and safety protocols. The resulting educational experience integrates experiential learning, assistive technologies, and engagement with the natural environment, enhancing psychosocial well-being, active social participation, and transitions towards autonomous and meaningful adult lives.

Keywords: *Digital skills, horticultural therapy, intellectual disabilities, orchard.*

AN EXPERIMENTAL STUDY OF THE MECHANICAL ENGINEERING KNOWLEDGE OF CHATGPT AND GEMINI IN HIGHER EDUCATION

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Abstract
This paper presents an experimental study benchmarking the mechanical engineering (ME) knowledge of advanced Large Language Models (LLMs), specifically ChatGPT 5o and Gemini 3.0, within the context of higher education. Utilizing a methodical seven-stage comprehension framework, this study evaluates the models' abilities to process skills ranging from basic dimensioning to complex spatial reasoning and mechanical design processes. The results indicate that while both models excel at reproducing standardized knowledge – scoring 80% (Gemini) and 78% (ChatGPT) overall – they exhibit significant limitations in spatial awareness and the interpretation of complex technical drawings. Specifically, both LLMs failed in tasks requiring the generation of projections and the estimation of dimensions for detailed manufacturing drawings. The study concludes that while LLMs are powerful tools for general ME inquiries, their tendency to act as "skilled deceivers" by presenting incorrect technical data as valid solutions necessitates that students still need strong foundational expertise to verify AI-generated content.

Keywords: *Mechanical engineering, LLM, engineering, benchmarking, engineering education.*

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THE MODEL OF DIGITAL TRANSFORMATION OF HIGHER EDUCATION INSTITUTIONS

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Abstract
Digital technologies are now deeply embedded in both personal and professional lives, prompting institutions to pursue digital transformation (DT). This process extends beyond technological advancement to encompass the reconfiguration of organisational structures, processes, and cultures. Successful DT depends on key foundations such as visionary leadership, strategic planning, effective resource allocation, adequate investment, and a culture that fosters innovation, adaptability, and continuous learning. In higher education, digital transformation is often linked to pedagogical innovation. However, administrative, managerial, and support processes are equally important, as they underpin improvements in educational quality, research performance, and overall institutional effectiveness. As public-sector organisations, universities also face additional pressures related to technological modernisation, regulatory requirements, and organisational restructuring. This study explores the main challenges, opportunities, and strategies that enable digital transformation in higher education, drawing on evidence from four European universities. A theoretical model of DT in higher education is proposed and empirically assessed through qualitative content analysis of institutional digital strategies and semi-structured interviews with university representatives involved in digital transformation initiatives. This approach offers an in-depth understanding of institutional strategies and practices. The findings show that digital transformation in higher education is a multidimensional process, not merely a technological undertaking, involving significant organisational, cultural, and competency-related changes. Effective transformation requires strategic foresight, systemic coordination, and sustained institutional commitment. The results also indicate that a clear digital strategy and active leadership are decisive drivers of digital transformation, while organisational culture, human resource capabilities, and management systems play significant supporting roles.

Keywords: *Digital transformation, higher education, model, institutions, interviews.*

INSTITUTIONAL EXPERIENCE OF THE UERJ PRÓ-SUS NETWORK: A MODEL OF ACADEMIC COLLABORATION AND PUBLIC HEALTH INNOVATION

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Abstract
The UERJ Pró-SUS Network is an institutional initiative coordinated by the Health Vice-Rectorate of the State University of Rio de Janeiro aimed at strengthening the Brazilian Unified Health System (SUS) through the integration of teaching, research, extension, and technological innovation. Designed as a collaborative and interdisciplinary platform, the network connects researchers, students, health professionals, and public managers to address concrete challenges faced by public health services. By 2025, the digital platform of the network had mapped approximately 200 academic projects related to the SUS and involved 39 academic and administrative units of the university, including research institutes and university health services. During the same period, 19 new interdisciplinary projects were structured to respond to strategic priorities such as health promotion in vulnerable territories, transgender health, environmental sustainability and health, digital health innovation, and care strategies for individuals with Autism Spectrum Disorder. The initiative illustrates how collaborative academic networks can strengthen health systems by translating scientific knowledge into applied solutions. The experience reinforces the role of universities as key actors in promoting equitable and sustainable public health policies.

Keywords: *Public health, SUS, health innovation, academic-service integration, interdisciplinary networks.*

WALLET-BASED MICRO-CREDENTIALS IN IMMERSIVE EDUCATION: EUROPEAN GOVERNANCE FOR PRIVACY-PRESERVING VERIFICATION

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Abstract
As European education increasingly experiments with immersive, metaverse-like environments, the portability of learning outcomes across institutions and platforms becomes a practical requirement. In parallel, European policy developments promote micro-credentials and the wider adoption of machine-verifiable attestations, increasingly conceived as wallet-presented verifiable credentials. This trajectory is reinforced by Regulation (EU) 2024/1183, which establishes the European Digital Identity Framework and provides the legal basis for European Digital Identity Wallets. Within immersive learning contexts—where learners may move across multiple platforms, institutions, and communities—credentialing becomes an infrastructure of trust, but also a potential source of privacy risks, particularly through linkability, metadata leakage, identity persistence, and excessive logging. This paper argues that the central governance challenge is not merely issuing digital credentials for immersive learning, but ensuring that credential ecosystems do not evolve into cross-context tracking infrastructures. To address this challenge, the paper develops a technical-legal governance model for privacy-preserving, interoperable educational credentials in the European context. The model combines a lifecycle-based risk taxonomy, privacy-preserving presentation patterns, and institutional governance levers for procurement and policy. It is then applied to a cross-institution European scenario in which immersive course completion is attested through wallet-presented credentials and verified by external institutions or employers. The paper concludes with a blueprint for privacy-preserving credentialing that supports trustworthy recognition of immersive learning outcomes while safeguarding learner privacy, agency, and fairness.

Keywords: *Verifiable credentials, digital identity wallets, data protection, governance, educational metaverse.*

CHALLENGES AND DEVELOPMENT OPPORTUNITIES OF GLOBAL TEAM LEARNING PROJECTS

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Abstract
Drawing on a thematic analysis of post-project self-reflection feedback from X-Culture participants, the paper highlights crucial lessons learned, performance disparities, and actionable recommendations to improve pedagogical design, thereby enhancing cross-cultural cooperation readiness in global online team learning. Learners in the global action learning project teams that had culturally diverse membership developed reports for enterprises interested in choosing and entering new export markets. In their post-project written reflections, students stressed several competencies for successful action learning in global online team settings. The most frequently mentioned competencies included mastering effective cross-cultural communication, adapting to diverse styles and expectations, and developing time management and scheduling skills across multiple time zones. Other vital takeaways include effective teamwork and collaboration, the emergence of informal leadership in virtual teams, and the need for adaptability when dealing with technical constraints. The paper highlights the pedagogic challenges of applying self-managing online project teams.

Keywords: *Action learning, cross-cultural learning, social skills, online teams.*

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ENTANGLED FUTURES? RETHINKING EDUCATION WITH HUMANS AND MACHINES

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Abstract
In this contribution, I explore how the entanglements of humans and machines are transforming the conceptual foundations of education. Drawing on posthumanist theory, I argue for a rethinking of the role of technology in education: not as a neutral or passive instrument, but as an active participant in shaping pedagogical presents and futures. Such a rethinking requires a critical examination of long-standing assumptions about education, knowledge, and agency. A posthumanist perspective challenges the human-centred view that culture or technology alone determines social and educational outcomes, emphasizing instead the co-constitutive relationships through which humans, technologies, and other agents collectively produce educational realities. As digital technologies increasingly co-shape classrooms, curricula, and pedagogical practices, education itself emerges as an entangled process involving human and other-than-human actors. This calls for moving beyond instrumentalist accounts of technology toward a relational understanding that recognizes its participation in educational practice. Drawing on Karen Barad's concept of entanglement, I examine pedagogical relations and their co-constitution, extending the discussion to include a broader range of participating agents. This is, at its core, an ontological issue, as agents do not pre-exist relations but emerge through entanglement and ongoing activity. Applied to education, this perspective aligns with Tim Fawns's argument that education is always enacted through technology, even when particular technologies remain largely invisible due to their deep integration into educational systems. Recognizing this raises further questions: Is a post-anthropocentric image of the world possible, desirable, or even necessary? What are the implications of genuinely including other-than-human agents in pedagogical thinking and practice? And how might such an expanded perspective reshape not only how we teach and learn, but also how we understand the aims and purposes of education itself? One tentative response suggested here is that the digital should not be viewed as a substitute for interpersonal educational practices, but as entangled with them (Bayne & Jandrić). In this vein, entangled pedagogy is proposed as a conceptual framework for rethinking educational agency beyond human-centred models.

Keywords: *Education, posthumanism, human, other-than-human, entanglements.*

CITIZEN SCIENCE AND CONNECTION WITH NATURE IN THE BIO-SOLAR PROJECT: ECOSOCIAL INVOLVEMENT IN RESEARCH ON BIODIVERSITY AND RENEWABLE ENERGY

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Abstract
The European project Bio_Solar proposes an innovative approach that combines science, education, and social participation to investigate the effects of solar parks on biodiversity and to promote sustainability in rural communities. Through citizen science programs developed in educational centers, the project fosters the involvement of students, teachers, and local residents in observing and recording flora and fauna species around photovoltaic installations. This active participation not only expands the scientific database on biodiversity but also strengthens the connection with nature, pro-environmental behaviors, and critical understanding of the energy transition. The work proposes the integration of digital tools and participatory methodologies (such as mobile applications and collaborative monitoring) that link formal learning with applied research, reinforcing the relationship between scientific knowledge and social action. Furthermore, the educational and social benefits of this co-designed and participatory intervention model are analyzed. Within the framework of Nature based Solutions (NBS), the Bio_Solar experience is presented as an opportunity to transform solar parks into spaces for active learning, intergenerational interaction, and environmental responsibility. The project demonstrates that education and citizen science are key tools to promote an inclusive and participatory ecological transition.

Keywords: *Citizen science, environmental education, renewable energy, biodiversity, connectedness to nature.*

AI TEACHING ASSISTANTS FOR TEACHER EDUCATION: A MIXED-METHOD STUDY

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Abstract
In the past two years, large language models have become an integral part of learning and teaching in schools and higher education. Given the rapid integration of artificial intelligence into everyday life, and into educational systems in particular, a comprehensive, multidisciplinary, and systematic approach is imperative to ensure both high-quality teaching and the development of essential learner competencies can be achieved effectively. Our team, proficient in diverse fields in both regular and special education, participated in a pilot program initiated by Bar-Ilan University. In this program, AI-based teaching assistants were developed for selected courses. Following this, we developed an AI-based teaching assistant specializing in planning, writing, and providing feedback on lesson plans and learning processes, which was then adapted into course-specific versions. Throughout the 2025 academic year, we implemented these assistants into our teacher education classes and conducted a mixed-method study using qualitative and quantitative questionnaires to examine students' perceived mastery and self-assessment of lesson planning skills. Participants included students in general education (n = 67), special education (n = 42), and a general education control group (n = 57). Findings indicate high student satisfaction and perceived support for clarifying assignment requirements and providing rapid, personalized feedback. In addition, there is qualitative evidence for the development of prompt literacy and critical monitoring. However, the analysis also highlights the importance of explicit instruction in prompt literacy and critical evaluation of AI outputs. These findings contribute to the emerging literature on integrating AI-based teaching assistants in teacher education.

Keywords: *AI teaching assistants, teacher education, lesson planning, self-regulated learning, formative feedback.*

FROM PERIPHERAL TO CORE: ENTREPRENEURSHIP EDUCATION IN THE CREATIVE INDUSTRIES

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Abstract
The European Union identifies entrepreneurship as a key competence for lifelong learning. However, across Europe's creative industries, including games, animation, and visual effects (VFX), graduates often complete their education with limited exposure to this competence, despite the prevalence of non-standard employment structures in these sectors. This study examined how entrepreneurship is perceived and integrated within higher education in the creative industries. Using thematic analysis of semi-structured interviews with 40 industry professionals, educators, and students, this study examined the perceptions, current practices, and barriers to implementing entrepreneurship education in games, animation, and VFX. The findings demonstrated that participants perceived entrepreneurial education as a vital competence in the creative sectors, particularly given the prevalence of freelance careers. However, its integration was affected by a combination of structural and cultural constraints, including the prioritisation of employability-driven metrics, curriculum overload, conflicts between entrepreneurial and creative values, and gaps in faculty expertise. Despite this, participants noted initiatives that can support entrepreneurship education, including using micro-credential models and reframing entrepreneurship to align with creative practice. Together, these findings highlight the importance of entrepreneurial competencies, the barriers to its integration, and the pathways through which higher education can better prepare graduates for careers in games, animation, and VFX.

Keywords: *Entrepreneurship education, entrepreneurial mindset, creative industries, games, animation, VFX.*

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DEVELOPMENT SCENARIOS OF COLLABORATION IN THE FIELD OF INCLUSIVE HIGHER EDUCATION BETWEEN RUSSIA AND CIS COUNTRIES: PROJECT-FORESIGHT

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Abstract
The study describes the results of the first round of a foresight project conducted in July 2025, aimed at identifying promising scenarios for the development of cooperation between Russia and CIS countries in the field of inclusive higher education. The research was a continuation of two preliminary pre-foresight sessions held in the spring of 2025. An expert survey, developed based on the initially formulated scenarios, was sent to experts from Russia, Belarus, Kyrgyzstan, and Uzbekistan for refinement. Experts assessed the probability of six different scenarios across three-time horizons (5, 10, and 15 years) on a five-point Likert scale and selected the most probable scenario for each time interval. The key findings of the study demonstrate cautious optimism. In the short term (5 years), the most probable scenario is recognized as the realistic "Points of Growth" scenario, characterized by parallel national initiatives with the exchange of best practices. In the medium term (10 years), preference is given to the "Points of Growth – Regional Synergy" scenario, which implies the deepening of inter-university cooperation and the emergence of regional centers. The long-term forecast (15 years) shows a divergence of opinions but a clear shift towards more optimistic and cooperative scenarios, in particular, the "International Hub – Integration through Cooperation" scenario, indicating the experts' belief in the potential for deeper integration over time. Negative scenarios implying isolation or a minimal level of cooperation received the lowest probability ratings. The conclusion of the study is that experts believe in the progressive development of inclusive education within the EAEU space, but they view this process as gradual, starting with local initiatives. Russia is seen as a potential source of expert knowledge, but successful cooperation requires dialogue on equal terms and adaptation to national contexts. The main challenges noted by experts are institutional and cultural barriers, conservative attitudes, and a lack of funding, while human capital is named the key resource base for initiating changes. The main result of the first iteration was the refinement of the expert questionnaire for the subsequent, expanded round of the project-foresight.

Keywords: *Inclusive education, international cooperation, Russia, CIS countries, scenarios, expert survey.*

INCLUSIVE LEARNING ENVIRONMENTS: A RESEARCH IN TUSCAN SCHOOLS

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Abstract
In recent years, international pedagogical debate has increasingly highlighted learning environments as a key factor in the quality and equity of education. Research shows that the physical and organizational configuration of school spaces significantly affects teaching and learning processes, students' participation, well-being, and inclusion. Consequently, the design of educational spaces requires a close dialogue between pedagogy and architecture. In Italy, INDIRE has made a significant contribution by promoting a vision of the school as an integrated learning environment characterized by flexible and interconnected spaces. This approach was formalized in the 2016 *Manifesto 1+4 Learning Spaces for the New Millenium* and later expanded to explicitly address inclusion. Within this framework, learning environments are conceived as resources for collaboration, deep learning, differentiation, and participation, in line with Universal Design for Learning principles. Building on this theoretical background, the Regional School Office for Tuscany (USR Toscana) and INDIRE launched a research project to investigate the impact of PNRR-funded interventions on the transformation of learning environments in Tuscan schools.

Keywords: *Inclusion, learning environments, equity, well-being, Tuscan schools.*

THE REALISE PROJECT – RESPONSIBLE EDUCATION AND LEARNING WITH ARTIFICIAL INTELLIGENCE IN SYSTEMS AND ELECTRONICS

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Abstract
The widespread availability of generative artificial intelligence (AI) tools is transforming university teaching practices, particularly in technical disciplines centered on programming, system design, and experimental validation. While these tools offer new opportunities for learning support and creativity, they also raise concerns regarding students' reasoning, autonomy, and professional ethics. The REALISE project—Responsible Education and Learning with Artificial Intelligence in Systems and Electronics—addresses this challenge through a pedagogical framework that promotes ethical, reflective, and responsible use of AI in engineering education. Developed at the School of Telecommunications Engineering of the Universidad Politécnica de Madrid (UPM), REALISE is implemented in three experimentally intensive courses: Laboratory of Electronic Systems (LSEL) in the Master's in Electronic Systems Engineering (MUISE), and Sectorial Applications (APSE) and Projects in Data and Systems Engineering (PIDS) in the Bachelor's in Data and Systems Engineering (GISD). The methodology combines project-based learning with explicit documentation of students' interactions with AI tools, requiring justification of prompts, generated outputs, corrections, and critical reflections. In LSEL, authentic learning is reinforced through real sensor measurements, diversified hardware configurations, practical constraints, and debugging of intentionally faulty code. In APSE and PIDS, students actively build and curate datasets for AI model development, fostering awareness of data quality, representativeness, and bias. REALISE aims to integrate "Responsible AI" as a transversal competence, strengthen analytical and documentation skills, and generate transferable educational materials for broader adoption. The project contributes to the modernization of engineering education by promoting a human-centered and ethically grounded digital transformation.

Keywords: *Artificial intelligence, responsible education, educational innovation, critical thinking, ethics, assessments and measurements in education.*

"WHAT'S NEXT?": A PROJECT-BASED STEM WORK EXPERIENCE MODEL FOR FUTURE TECHNOLOGISTS

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Abstract
This paper aims to present and evaluate 'What's Next?', a project-based STEM work experience model designed to bridge classroom learning and industry readiness for secondary pupils. Unlike typical STEM placements, the programme combines agile rituals, peer-led teaching, and structured reflection against 17 competencies, creating a distinctive approach that blends technical practice with metacognitive and civic dimensions. We designed "What's Next?" to feel like a real week in a software team. In collaboration with Cardiff Commitment and Technocamps, pupils in Years 10–12 stepped into roles, ran sprints, built educational tech, and then taught younger learners using what they had made. Over two summers (2023–2024), demand grew from 28 to 32 places from ~80 applicants, and in 2025, 96% of participants said they would recommend the programme. In this paper, we tell the story of how the week works—day by day—why we chose agile rituals and accessible tools (Minecraft Education, LEGO® SPIKE™, BBC micro:bit), and how daily reflection against 17 skills connected classroom learning with workplace expectations. We situate the design within the Curriculum for Wales Digital Competence Framework and the Cardiff Commitment ecosystem and draw on evidence from STEM project-based learning, agile pedagogy, and game/robotics-based education. The narrative offers a replicable pattern for schools, universities, and employers who want to build inclusive, high-engagement STEM work experiences that align with regional skills needs (Department for Education, 2025; Open University in Wales, 2025).

Keywords: *STEM education, project-based learning, work experience, agile learning, digital competence.*

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AN INTEGRATED EDUCATIONAL CONTENT ON WATER SECURITY AS A TOOL FOR ACHIEVING SUSTAINABLE DEVELOPMENT GOALS

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Abstract
Modern higher education requires a strategic shift toward student-centered and competence-based approaches, as emphasized by the Bologna Process and the EHEA communiqués from Yerevan, Paris, and Rome. A critical challenge remains the formation of educational content that bridges the gap between fundamental theories and professional practice. This research is supported by the Institute for Human Sciences (IWM) under the Documenting Ukraine grant. This research proposes an integrated approach to modernize environmental education, specifically through the development of an interdisciplinary "Water Security" course designed for Master's students. The study's objective was to create an effective didactic system that systematizes knowledge of natural-science theories while addressing urgent global issues such as climate change, water monitoring, and sustainable development. The "Water Security" course serves as a primary example of this model, integrating international practices, water policy, and environmental management into a cohesive module. The curriculum focuses on the co-evolutionary development of human society and nature, emphasizing the environmental imperative and professional responsibility for water resources. The methodology employed was comprehensive, including component analysis of ecological knowledge, postoperative analysis of subject skills, and educational experiments. To evaluate the effectiveness of the training, mathematical statistics were used to calculate the acquisition coefficient of knowledge. The study involved three years of experimental validation, demonstrating high didactic effectiveness. Results showed that students achieved an average knowledge acquisition coefficient of 0.85, significantly exceeding the satisfactory threshold of 0.60. The integrated approach was implemented across three distinct levels: internal disciplinary integration, interdisciplinary connections, and the highest level of methodological synthesis. In conclusion, the integrated approach to "Water Security" not only improves the quality of professional training but also fosters a co-evolutionary worldview and environmental responsibility. This model effectively extrapolates modern scientific developments into curricula, helping students master complex dimensions of environmental policy and international legal frameworks. Future research will focus on improving assessment methodologies for these integrated modules and refining the theoretical provisions of content integration to ensure the continuity of educational objectives.

Keywords: *Water security, integrated approach, sustainable development, environmental education, interdisciplinary learning.*

RETHINKING SPACE TO RETHINK LEARNING: DESIGNING INCLUSIVE SCHOOLS FOR ALL

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Abstract
Research increasingly shows that learning environments shape participation, engagement and well-being, and that inclusion requires more than removing architectural barriers. Building on this evidence, INDIRE has advanced a view of the school as an integrated and permeable learning environment, formalised in the 1+4 Manifesto "Spaces for a New Generation of School in Italy" and subsequent studies. Grounded in Universal Design for Learning and the WHO ICF bio-psycho-social model, the framework links spatial configurations to teaching strategies and to learners' diverse functioning profiles. To support teachers' reflective planning, INDIRE developed a digital application that helps identify environmental facilitators and barriers and align space, pedagogy and student needs. Pilots in professional development contexts show the tool supports self-evaluation and guides design choices that strengthen equity and participation

Keywords: *Inclusion, learning environments, equity, teaching-learning activities.*

TEACHING AND LEARNING INFORMATICS: VOICES OF STUDENTS, TEACHERS, PARENTS, NGOS AND EMPLOYERS

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Abstract
In the rapidly changing digital society, informatics education is becoming one of the most essential domains of contemporary literacy. However, the teaching of informatics in schools remains heterogeneous and fragmented, and its content often fails to meet the needs of both the education system and the labor market. In this context, there is a growing need to thoroughly analyze how different groups within the educational community—students, teachers, parents, non-governmental organizations, and employers—perceive the process of learning and teaching informatics, its significance, and its challenges, in order to understand the factors that determine the effectiveness of this subject and how diverse perspectives can contribute to systemic change. The aim of the study is to reveal the perceptions and experiences of teaching and learning informatics from the viewpoints of different actors within the educational ecosystem, with the goal of identifying key issues and outlining directions for further development in this field. The research is based on a mixed-methods approach, employing qualitative interviews, questionnaires, and content analysis. Data were collected from five groups of respondents: students, teachers, parents, representatives of NGOs, and employers. This multi-voiced approach ensured data triangulation and provided a comprehensive understanding of the context of informatics education. The findings indicate that a holistic approach to informatics education is essential, one that integrates technological, creative, and social literacies. It is recommended to strengthen professional support for teachers, improve infrastructure, enhance cross-sector collaboration, and integrate informatics content with other subjects. Such a system would help to reduce the gap between education and the labor market, foster students' creativity and critical thinking, and promote the development of a sustainable informatics education model that meets the challenges of the 21st century.

Keywords: *Informatics education, computer science, teaching and learning, educational stakeholders, holistic learning approach.*

FOSTERING POSITIVE ATTITUDES TOWARD ENGLISH LEARNING: A JAPANESE SCHOOL CASE USING "SMALL TALK" AND INTERNATIONAL UNDERSTANDING

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Abstract
The early introduction and formalization of English education in elementary schools have made the transition between elementary and junior high school a critical issue. While the introduction of foreign language activities in elementary schools has improved students' English proficiency and reduced resistance to learning English, the number of children who dislike English has been increasing. Factors cited for this include insufficient coordination between elementary and junior high schools, increased difficulty in content, and teaching methods. At the elementary level, the goal is to cultivate the foundational qualities and abilities for communication, and language activities are essential for achieving this. It is hypothesized that the effective utilization of Small Talk from an intercultural perspective can help children experience the joy of communication, thereby sustaining or enhancing their motivation for English learning and fostering their interest in cross-cultural understanding. This presentation reports on the findings from an inquiry into how a year-long focus on Small Talk instruction at Elementary School A influenced children's perceptions and learning motivation. Using the classroom practices at Elementary School A, where English aversion is low, as a case study, we clarify how children's positive attitudes toward English learning are sustained through a year of classroom observation, student questionnaires, and interviews with the teaching staffs. This study examines classroom features that foster positive engagement in English language learning among Japanese elementary school students, with a particular focus on Small Talk and international understanding. The lessons are characterized by innovative use of Small Talk and dynamic progression. Multiple instances of Small Talk are conducted with assistant language teachers (ALTs) during each class session—including introductions, pre-activity demonstrations, and mid-lesson guidance—creating an

environment in which children naturally become familiar with English expressions. Instructors primarily use Classroom English, employing simple language supported by concrete objects and gestures to minimize Japanese usage. This approach cultivates students' ability to infer meaning from purpose, context, and situation. Instructional formats appropriately combine whole-class, individual, and collaborative learning to deliver personalized guidance. Additionally, ICT tools such as tablets and digital textbooks are partially and effectively utilized to visualize learning and provide interactive experiences designed to spark children's interest. Abundant opportunities for language activities and performances in pairs or groups are provided, with JTEs and ALTs actively engaging in communication tasks and offering positive feedback. The lesson design also incorporates perspectives on cross-cultural and international understanding, contributing to the development of students' global awareness and communicative competence.

Keywords: *Small talk, international understanding, Japanese elementary school, English education.*

BUILDING EMPLOYABILITY THROUGH RESILIENCE: THE MAFA MODULE AS PEDAGOGIC INNOVATION IN HIGHER EDUCATION

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Abstract
In the ever-changing world of work, universities face growing pressure to equip students not only with academic knowledge but with the agility, resilience, and confidence employers demand (Tomlinson, 2008; CMI, 2019). The Mental Agility, Flexibility, and Adaptability (MAFA) module was designed at Anglia Ruskin University (ARU) as an innovative co-curricular programme to address these challenges by embedding resilience and employability into the student experience. Developed in 2021 within the Faculty of Business and Law, MAFA emerged in response to students' declining confidence and adaptability following the COVID-19 pandemic (Akin-Odanye et al., 2021). Informed by the 4Cs framework of Mental Toughness (Strycharczyk et al., 2020), the module combines psychometric assessment (MTQ+), reflective activities, and interactive learning to foster self-awareness, adaptability, and confidence. Delivered as part of ARU Certificate for Professional Development (a university-wide accredited co-curricular framework), MAFA has attracted students from across faculties, supporting interdisciplinary collaboration and inclusive participation. The module's design was collaborative, engaging senior faculty, employability professionals, and external partners, ensuring alignment with institutional strategy and quality assurance standards. Delivery emphasises student-centred pedagogy, including peer learning, gamified tools (Kahoot, Mentimeter), and co-creation. Feedback has been overwhelmingly positive, with 98% of students reporting satisfaction. One participant reflected: *"I didn't have self-confidence before this module… now I feel ready to do things without fear or self-doubt."* A distinctive feature is the MAFA Champions Programme (from 2023), which empowers graduates of the module to co-design activities for future cohorts under an accredited Project Leadership module. This initiative enhances student ownership, ensures responsiveness to evolving learner needs, and models best practice in participatory curriculum design (Jones, Yazdani & Barton, 2019). The impact of MAFA extends beyond ARU. Guest lectures across psychology, criminology, and law inspired colleagues to embed resilience content in their teaching, demonstrating transferability across disciplines. Internationally, the module has been adapted for Intercultural Exchange programmes, supporting students to navigate cultural transitions abroad. Recognised in *The Employability Code* (2024), MAFA exemplifies pedagogic innovation, inclusive curriculum design, and global knowledge exchange. It demonstrates how resilience and employability can be meaningfully integrated into higher education through evidence-informed, student-centred practice. By embedding employability, wellbeing, and adaptability into the curriculum, MAFA responds to pressing sectoral challenges, offering a replicable model of innovation that strengthens both student outcomes and institutional learning culture.

Keywords: *Employability, resilience, pedagogy, curriculum innovation, student-centred learning.*

EDUCATIONAL ASSISTANCE FOR CHILDREN WITH INDIVIDUAL AND SPECIAL EDUCATIONAL NEEDS: WHAT WORKS AND WHAT'S NEXT?

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Abstract
Inclusive education is one of the essential conditions for ensuring the well-being of each child. UNESCO's universal education goal is to ensure quality, inclusive, and equitable education and to promote lifelong learning opportunities for all. To achieve the goals of inclusive education, educational assistance plays a crucial role, as it aims to enhance the effectiveness of education for all participants in the educational process. A complex mixed research methodology was employed for the study, combining quantitative and qualitative methodologies, with the aim of integrating data obtained through various methods and achieving comprehensive results. A representative survey of teachers, students, and parents (N = 5,801) and two Focus groups with specialists from educational psychology services were conducted during the study. This report covers only a small part of a larger study aimed at identifying the factors that determine the success of educational assistance in schools and to reveal directions we should take to achieve greater accessibility and effectiveness of support. The results of the study revealed that we need to pay more attention to children who have not been identified as having special educational needs, but still have educational needs and, in most cases, do not receive any educational support, and perform poorly at school. The results also enable us to make assumptions about the effectiveness of support. Support is effective when the availability of educational support is ensured, a full child welfare team exists at school with a high level of cooperation and teamwork competencies, flexible and timely support is provided to each child, and the child and parents are involved in the educational assistance process. In addition, in schools where educational support specialists (special and social pedagogues, speech therapists, psychologists) provide assistance, there is a greater expression of an inclusive education culture

Keywords: *Educational assistance, individual and special educational needs, accessibility and effectiveness of the educational assistance, inclusive education.*

AVENUE: EARLY FINDINGS FROM A PAN-EUROPEAN CENTRE OF VOCATIONAL EXCELLENCE ON EMERGING SKILLS IN THE CREATIVE VISUAL INDUSTRIES

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Abstract
Rapid technological change across the creative visual industries is increasingly misaligned with the update cycles of vocational education and training (VET). AVENUE is a four-year Erasmus+ Centres of Vocational Excellence initiative connecting five European ecosystems: animation, games, extended reality (XR), virtual production, and visual storytelling. This paper presents early findings from the first year of the project, which focused on establishing a repeatable evidence-to-action research loop. Using ecosystem-specific literature reviews, semi-structured interviews, and stakeholder consultations, the research identified converging skill patterns across sectors. These include the normalisation of hybrid technical-creative roles, a strong preference for short-cycle and modular upskilling formats, and the growing importance of transversal competences alongside software proficiency. As these findings represent an initial snapshot within a four-year programme, the paper also outlines forthcoming research and implementation phases through which insights will be iteratively tested via pilot training offers, micro-credentials, and curriculum adaptation.

Keywords: *Vocational excellence, creative visual industries, emerging skills, micro-credentials, modular learning paths.*

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LEARNING BY SOLVING AND SENSING: DATA-INFORMED PERSPECTIVES ON PROBLEM-BASED LEARNING

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Abstract
This study explores students' perceptions of the impact of PBL on their communication, collaboration, critical thinking, and motivation when applied in a blended learning context. PBL is grounded in the principle that learning occurs through the active resolution of authentic, real-world problems, thereby fostering critical thinking, collaboration, and autonomous learning. The research is based on quantitative data collected through a structured questionnaire consisting of two main sections: (1) perceived effects of PBL on different acquired skills, and (2) attitudes toward PBL compared with traditional teaching methods. The study involved 96 first-year students enrolled in 2023/24 academic year in a professional first-cycle programme at the Faculty of Public Administration, University of Ljubljana, in a blended English for Specific Purposes course. The Moodle Learning Management System (LMS) supported the PBL approach, while MS Teams facilitated group communication. The findings of this study contribute to the ongoing discourse on innovative teaching methodologies in language education and underscore the potential of PBL to bridge the gap between theoretical knowledge and practical application.

Keywords: *Problem-based learning, learning analytics, blended learning, higher education, student engagement.*

GAMIFICATION AND FACILITATION METHODS IN SUSTAINABILITY TRAINING FOR SMES

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Abstract
Issues and requirements related to sustainable development, both at the interfaces of companies and within broader value chains, challenge SME personnel in identifying and developing the necessary and sufficient factors. Some SME employees have found it challenging to identify areas of sustainable development relevant to their operating environments. In these contexts, the need to develop one's own competence is recognized. Still, after prior training several years earlier, the effectiveness of one's study techniques and the continued employability of studying while working full-time are doubted. To meet the requirements of sustainable development, both as part of value chains and to maintain competitiveness with end users, SMEs must ensure that their personnel possess sufficient sustainability competence within their operating environments. To meet these needs, studies on sustainable development were conducted that employed gamification, for example, through the facilitation of Lego Serious Play and Cambridge Value Mapping. These approaches were chosen to lower the threshold for participation in the training and to enable a more concrete understanding of the interfaces and the development of sustainable development in one's own operating environment. In addition, gamification and various facilitation methods are part of higher education. The methods are seen as motivating, participatory, intensive, and meaningful ways of studying, which make the material better understood and learning more meaningful. Flexible support, combined with gamification and facilitation, can enhance learning when examined from different perspectives. In gamification, learning progress can be monitored, and creative task types can be integrated into the task design. In this article, we discuss gamification and facilitation methods in online studies on corporate responsibility aimed at SME personnel, and in hybrid studies on sustainability, which included workshops conducted in face-to-face meetings using the Lego Serious Play and Cambridge Value Mapping methods. Participation in the set of tasks on corporate responsibility, implemented on the SEPPO game platform and in the workshops, was enthusiastic from the perspective of responsible SME operations. According to feedback, participants reported receiving value for their time and that their competence had increased through gamification tasks and study-related work methods.

Keywords: *SME, higher education, sustainability, gamification, facilitation.*

OPPORTUNITIES AND CHALLENGES OF AI IN EDUCATION: A DIDACTIC PERSPECTIVE

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Abstract
The complexity inherent in lesson planning represents a significant challenge, particularly for novice teachers or those in training. A wide range of conditions must be taken into account, and highly interrelated decisions must be made. Furthermore, the individualization of learning processes for learners in learning groups of 25 or more participants represents a problem not only for novice teachers. For this reason, the present paper examines the question of how action-oriented teaching for vocational schools can be planned and evaluated with the help of generative AI tools. The technical focus is on the teaching of the fundamentals of electrical engineering, with a particular emphasis on addressing and, if necessary, correcting learners' preconceptions.

Keywords: *Constructivist didactics of electrical engineering (cDoEE), fundamentals of electrical engineering, preconceptions, learning plan.*

"2 LONG 2 READ": STUDENT PERCEPTION OF READING IN HIGHER EDUCATION INSTITUTIONS

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Abstract
With the rise of digital technology, Higher Education Institutions (HEIs) were initially reticent to replace traditional teaching modes with digital tools. Nonetheless, they adapted to the reality of our increasingly digitalized society where the learning environment is characterized by a complete infusion of technology in the life and learning of our today's students. They live in a digital age with high rapidity and ongoing stimulation, which often translates into multitasking and a desire to 'speed-date' through information, hopping from one source to another and rapidly choosing the one that interests them most. Paper-based tools are replaced by digital devices. Thus, learning takes place in a space of rapid resources and quick fixes, reducing the time spent on traditionally 'tedious' academic tasks like reading full textbooks or writing 5,000-word essays. What are the consequences of this major change? The effort and pride in truly assimilating what has been read, the 'a-ha' moments of yore, seem to be outdated. Research has proven that authentic learning needs time. Digital tools tout their time-saving features. Ideally, these two concepts would join together, i.e., using technology to save time on superficial tasks, thus leaving more time for engrossed and concentrated reading. To investigate this topic, we posit three questions: RQ1: How much time do our students spend on reading?; RQ2: Which "tool" do they use for their reading?; RQ3: What motivations do they need to read?. To gather data, surveys were sent to 500 students in one HEI in Switzerland. In accordance with the literature, today's students are less motivated to read academic texts, spend less time reading, and, when they finally read, do so in a fragmented and answer-driven manner, skimming for the answer to the prompt over reading a text in its entirety, helped by the emergence of a new tool: The introduction of Generative Artificial Intelligence (Gen AI) that supplies easy summaries of any complex text. The emphasis on saving time seems to supersede that of deep learning and authentic engagement. As our project continues, we will expand the sample to include other HEIs in Switzerland to define an inclusive learning framework that includes foundational skills for the future. The utility of technology must be questioned as young graduates need digital tools to complete certain tasks, but not at the expense of learning. Students must be prepared for a workplace that includes the *best* use of traditional and digital tools.

Keywords: *Higher Education Institutions (HEIs), students, reading, technology, literacy*.

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TRANSFORMATIVE TEACHING AND LEARNING: HOW TO BRIDGE SPANISH LANGUAGE LEARNING AND LIVED EXPERIENCES IN A LATIN AMERICAN LITERATURE CLASSROOM?

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Abstract
This study examines students' perspectives on Latin-American identity literary representations. Experiential Pedagogies emphasize the importance of bridging students' voices through dialogue. This empirical project explored how dialogue encouraged reflection, and collaboration as community-based practice. The dialogic activity facilitated a space for students' linguistic proficiency, intercultural competence, and personal growth. The anonymous students' data from 16 self-reflections in the circle of voices was analyzed qualitatively based on experiential practices through descriptive interpretative analysis. The findings indicate that students perceived discussions as space to express their feelings on identity. Also, the students' essays' analysis focuses on guided questions to identify skills and themes illustrating their progress in spoken language. These findings contribute to deeper understanding of students' perceptions on identity and practice of Spanish as a foreign language in higher education.

Keywords: *Linguistic and cultural competence, dialogue, Ikeda/Soka studies, experiential learning, identity.*

EXPLORING TEACHERS' SELF-EFFICACY FOR INCLUSION THROUGH A TUTOR-AI ASSISTANT: A PRELIMINARY EXPERT VALIDATION STUDY

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Abstract
Teachers' self-efficacy for inclusion is fundamental to the implementation of inclusive educational practices, shaping their ability to manage diversity, engage in reflective practice, and maintain professional agency. Within a socio-cognitive framework, the present study describes the design and preliminary expert validation of a Tutor-AI Assistant designed to enhance teachers' self-efficacy for inclusion through guided reflection. The digital tutor is based on Bandura's theory of self-efficacy and is organized around its four sources/modules: mastery experiences, vicarious experiences, social persuasion, and emotional and physiological states. A design-oriented methodology was employed, followed by an expert validation phase with five pedagogical experts specializing in teacher education and inclusive education. After testing the tutor, experts participated in semi-structured interviews, which were subsequently analyzed using thematic analysis (Braun and Clarke, 2006, 2022). The analysis revealed three overarching themes: theoretical and methodological coherence, which underscores the tutor's strong conceptual foundation and pedagogical clarity; usability, which highlights the significance of accessible language and practical integration into teachers' routines; and the reflective dimension, identified as the primary strength of the tool in promoting metacognitive awareness and professional self-reflection. Overall, the findings indicate that the Tutor-AI Assistant is a promising reflective tool for supporting teacher professional development. These results will guide further refinement and support future empirical testing with in-service teachers to evaluate their impact on self-efficacy for inclusive practices.

Keywords: *Teachers' self-efficacy, inclusion, Tutor-AI assistant, reflective practice, teacher professional development.*

SEAMLESS COLLABORATION IN DISTANCE LEARNING: EXPLORING THE ROLE OF AN EMBEDDED VIDEO-CONFERENCING-SYSTEM IN GROUP WORK

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Abstract
Collaborative learning is a cornerstone of modern education, offering significant academic, social, and psychological benefits. However, effective group work in distance learning environments remains challenging, particularly when it comes to fostering seamless communication and collaboration. This study investigates the integration of an embedded video conferencing system within a collaborative writing platform to enhance group work in a distance learning context. Using a mixed-methods approach, we examined how students utilized the system and explored the communication dynamics and social interactions that emerged during collaborative tasks. Data were collected from 353 students enrolled in a bachelor's-level psychology course, who participated in group writing tasks using the platform. Results revealed that while the system was frequently used for task-oriented activities such as organizing group work and discussing course content, its adoption for social interactions was limited. Sentiment analysis of video conferences indicated a neutral to slightly positive tone. Among 4,646 coded utterances, mean sentiment polarity was 0.12 and subjectivity 0.05, confirming task-focused, neutral-to-positive discourse with highly objective discussions focused on academic tasks. These findings suggest that while the embedded system effectively supports task-focused collaboration, additional features may be needed to foster social engagement and interpersonal connections. The study highlights the importance of designing collaborative tools that balance academic functionality with social interaction, offering valuable insights for educators and developers aiming to optimize virtual learning environments. Future research should explore broader applications of the system across disciplines and investigate strategies to enhance user acceptance and engagement.

Keywords: *Video conferencing system, virtual collaboration, cooperative learning, distance learning, learning technology.*

IDENTIFYING THE DROP-OUT DECISION MOMENT IN PROGRAMMING MOOC STUDENT PROGRESS DATA

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Abstract
Although Massive Open Online Courses (MOOCs) on programming are considered a proven way of teaching this difficult subject to large audiences, they also suffer from high dropout rates, often exceeding 90%, which leads to ineffective allocation of instructors' effort, wasted on providing support to students who are not willing to finish the course anyway. This paper analyzes course progress data gathered from students attending a MOOC on introduction to programming in Python to pinpoint the course sections at which learners most often drop out as well as investigate the correlation between the students' performance at earlier course sections and their dropping out at the later sections. The key findings include: large differences in dropout rates among respective course sections; the lack of course sections that the students' low performance at which could be used as a good predictor of their later dropout; and the relatively high variety in the predictability of dropout at respective course sections depending on the students' performance at the earlier course sections. The findings bring practical implications for both MOOC developers and instructors.

Keywords: *Student dropout analysis, student dropout prediction, programming MOOC, MOOC management.*

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A CURRICULUM-ALIGNED SCREENING TOOL FOR IDENTIFYING MATHEMATICAL LEARNING DIFFICULTIES IN GRADE 3

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Abstract
This study focuses on the development and initial testing of a school-based mathematics screening tool intended to assess whether third-grade students have acquired the essential skills and knowledge required for a solid foundation in further mathematics learning and to identify children with mathematical learning difficulties. A quantitative empirical design was used to construct a curriculum-aligned assessment consisting of a written and oral component. Results indicate that approximately 5–8% of students demonstrated performance profiles consistent with MLD, with specific difficulties observed in multiplicative reasoning, unit conversion, and verbal description of geometric solids. The test was administered in five schools in Tallinn. A total of 251 students participated in the written assessment and 82 students in the oral assessment. Based on the analysis of the test results, it can be concluded that the test presented in this article offers an overview of students' attainment in mathematics. Furthermore, the results can be used by professionals working with children to plan and implement their work more effectively.

Keywords: *Mathematical learning difficulties, mathematics assessment, screening tool.*

PROMOTING EDUCATION AND CAREERS IN LOGISTICS THROUGH AN ONLINE PLATFORM CENTRED ON THE NEEDS OF TEACHERS AND STUDENTS

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Abstract
The logistics industry is undergoing considerable transformation due to three major trends: digitalisation, sustainability, and internationalisation. This requires employees to demonstrate not only the capacity to manage increasingly challenging tasks, but also a repertoire of subject-specific and interdisciplinary competencies, often referred to as "hybrid skills". However, the logistics industry is currently facing challenges due to a shortage of skilled workers and the significant need to motivate young people to pursue careers in the sector. Since 2016, the web platform "RETrans" offers quality-assured, free of charge information and teaching materials on transport logistics, primarily targeting teachers and aiming to raise interest for jobs in the logistics industry. The need to update the RETrans platform is driven by two key factors. Firstly, there have been significant changes in the logistics industry, which have necessitated an update to the platform to ensure it remains relevant. Secondly, the platform has specific potential for improvements to ensure its success in the long run. The present paper sets forth the findings of a thorough evaluation of the RETrans-platform with two objectives: firstly, to enhance the platform's quality and user base, and, secondly, to discern prospective directions that centre on ensuring its relevance in the future. The evaluation comprises an online survey among school students, a workshop with didactics and e-learning experts, workshops with teachers and logisticians, as well as a focus group with university students in logistics. The findings indicate that overall RETrans offers trustworthy information and excellent materials and some adaptions can even further improve its performance. Teaching materials should contain more didactic information, such as intended learning objectives and competencies, application scenarios, and specific teaching methods, to facilitate integration into specific curricula. There is also a lack of teaching materials that promote self-organised learning. Furthermore, the evaluation identifies room for improvements regarding the website's usability and aesthetics and reveals a strong need to include future-oriented topics such as sustainability, digitalisation, and internationalisation to address the dynamic competence requirements of the sector. The formulated recommendations act as guiding principles for the platform's redesign and may inspire similar initiatives in fields beyond logistics.

Keywords: *Logistics, skills shortage, promotion of careers, RETrans, RETrans4Future.*

INNOVATIVE TECH CHALLENGES AS CATALYSTS OF STUDENT CREATIVITY: CROSS-NATIONAL EVIDENCE FROM THE ERASMUS+ SMART SOLUTIONS PROJECT

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Abstract
Purpose: This paper presents findings from the *Innovative Tech Challenges* (IO2) of the Erasmus+ *Smart Solutions* project (2024–2026), which aims to enhance digital literacy and creativity through scenario-based learning activities in secondary education across Europe. *Method:* Seventy digital challenges integrating problem-based learning, design thinking, and visual-based learning were co-created by partners from Ireland, Turkey, Latvia, Portugal, Italy, Romania, and Poland. The 2025 piloting phase involved 312 students and 68 teachers who completed selected tasks and provided feedback through post-piloting questionnaires and follow-up interviews. *Results:* Self-reported data indicate significant perceived improvement in digital creativity and problem-solving competences, particularly within DigComp areas 4 and 5. Students emphasized increased motivation, collaboration, and confidence in using digital tools, while teachers noted improved facilitation skills and readiness to apply open-ended, technology-supported methods. *Conclusions:* The results suggest that narrative-driven, challenge-based learning effectively promotes creativity and transversal competences in diverse classrooms. The paper outlines key pedagogical insights and practical guidelines for integrating such digital challenges into curricula and sustaining innovation through European cooperation.

Keywords: *Digital competences, creativity, problem-based learning, design thinking, Erasmus+, secondary education.*

ON THE IMPACT OF SUBJECT OF STUDY, SELF-REGULATION LEARNING AND MATHEMATICS ANXIETY ON ACADEMIC DROPOUT

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Abstract
Early dropout is a common problem in many universities due to its financial and social impact on the students themselves. In recent years, studies on variables that affect dropout and predictive models of dropout have become increasingly popular. By understanding the relationship between these variables, it is possible to design intervention strategies that help reduce dropout. In this study, we analyse the relationship between the relationship between two subdimensions of a construct of risk of university drop-out, subdimensions of the related to self-regulation construct, mathematics anxiety and subject of study. In particular, we wonder whether students from degrees of the same knowledge area attain similar scores on the variables considered. Data are collected from a sample of more than 700 students from three different universities. The results indicate several intercorrelations between the variables considered. Last, the degrees of Medicine and Architecture seem to be the most successful on retaining students, despite being from different knowledge areas. Testimonials from programme coordinators were gathered from each of these two degrees separately to provide insights on the reasons for this. The testimonials coincided in the need of professional academic advising programmes to support the transition to university as well as for preventing student burnt-out.

Keywords: *Self-regulation, motivation, drop-out, student retention, mathematics anxiety.*

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INTEGRAR: CAPACITY BUILDING AND PSYCHOSOCIAL CARE TO STRENGTHEN INCLUSIVE NETWORKS IN VULNERABLE TERRITORIES

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Abstract
Persistent social inequalities and fragmented public policies intensify the vulnerability of families responsible for caring for neurodivergent children and adolescents, particularly in low Human Development Index territories. The lack of integrated intersectoral strategies undermines inclusive educational practices, access to rights, and the consolidation of effective social protection networks. This paper presents and analyzes the INTEGRAR Project, an initiative designed to implement an integrated model of capacity building and psychosocial care aimed at strengthening local protection networks, promoting inclusive educational practices, and fostering social and economic autonomy among families living in vulnerable contexts. The project adopts an intersectoral, territorialized, and care-centered methodology, operationalized through the establishment of Regional Care Centers. These centers integrate continuous training for education professionals, psychosocial support for children, adolescents, and caregivers, community-based training workshops, and childcare spaces. Project evaluation is based on a mixed-methods approach, combining quantitative indicators related to access, identification, and referral of vulnerability situations with qualitative analyses of participants' experiences and institutional practices. Expected outcomes include enhanced institutional capacity to identify and respond to risk situations within educational settings, strengthened coordination among education, social protection, and health sectors, and the development of intersectoral protocols to improve public responses in the targeted territories. The INTEGRAR Project is presented as an innovative and replicable model that articulates education, care, and social policies, contributing to the disruption of intergenerational cycles of exclusion and to the promotion of inclusion, equity, and sustainable social development.

Keywords: *Social inclusion, capacity building, psychosocial care, inclusive education, intersectoral networks.*

GENDER STEREOTYPES IN EDUCATION: HIDDEN MECHANISMS AND THEIR IMPACT ON ATTITUDES TOWARD STEM

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Abstract
Despite the growing number of initiatives promoting equality in education, entrenched gender stereotypes continue to influence students' educational choices. Girls in particular often internalize beliefs about their alleged lack of aptitude for science and technology, which undermines their self-confidence and limits their participation in STEM subjects (science, technology, engineering, mathematics). The aim of this project is to identify and analyze gender stereotypes operating within the school environment and to assess their impact on girls' self-assessed competencies, motivation, and educational decisions. The study also seeks to highlight effective teaching strategies and support tools that may help neutralize these stereotypes. A mixed-methods approach was employed. The quantitative component involved a survey of secondary school students, measuring self-perceived abilities in science, attitudes toward gender roles, and declared educational choices. The qualitative component included focus group interviews with female students and teachers, exploring experiences related to gender equality and academic support. The data were analyzed using statistical and thematic methods. The findings indicate that gender stereotypes continue to significantly affect how girls perceive their scientific abilities. Protective factors include exposure to female role models and educational environments that promote equality and collaboration. The results may serve as a foundation for developing pedagogical recommendations and support programs aimed at empowering girls in STEM, as well as for informing educational policies focused on reducing gender disparities.

Keywords: *Gender stereotypes, STEM, educational equality.*

TEACHERS' PERCEPTIONS OF LEARNER SUPPORT IN SOUTH AFRICAN RURAL SECONDARY EDUCATION

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Abstract
This study investigates how teachers in South African rural secondary schools understand and enact learner support in contexts characterised by poverty, geographic isolation, and limited services, with a focus on the psychosocial and academic dimensions, and on the potential of inclusive and decolonial practices to improve outcomes. Two quintile 1–2 public secondary schools in one district were conveniently selected for their high socio-economic disadvantage and documented learner vulnerability, and six teachers were purposively sampled to represent varied subjects, experience, and roles within learner support structures. Using a qualitative participatory action research design grounded in a constructivist paradigm and informed by Community of Practice theory, the study positioned teachers as co-researchers. Data were generated through collaborative group discussions and reflective diaries, capturing teachers' everyday practices and emerging understandings of decolonial psychosocial care, and were analysed thematically with collaborative validation and verbatim quotations. Teachers reported pervasive barriers to effective learner support, including overcrowded classes, limited access to specialist psychosocial services, food insecurity, and the emotional strain of working in high-poverty, high-trauma environments. Concurrently, they identified key local assets, such as strong family–school relationships, learner peer solidarity, and supportive faith and community networks that they mobilised as community-linked support. Teachers described using a range of inclusive pedagogical strategies, particularly differentiated instruction and cooperative learning, and associated decolonial psychosocial support with valuing learners' cultural identities, using home languages, and integrating indigenous and communal practices of care. The study concludes that teachers' contextually grounded practices, decolonial orientations, and community partnerships provide a vital foundation for stronger learner support, but that systemic constraints limit their impact. It recommends that policy commitments to inclusion and decoloniality be supported by targeted investments in teacher professional development, strengthened school-based support teams, formalised partnerships with local services and communities, and improved resourcing for rural schools. These measures are essential to move towards a more equitable and responsive system of learner support in South African rural secondary education.

Keywords: *Inclusive pedagogy, psychosocial support, learner support, teacher perceptions, South Africa.*

EDUCATION FOR THE FUTURE IN THE FIELD OF ENERGY SAVINGS AND ENERGY LITERACY

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Abstract
Energy represents an inseparable part of modern life and technological progress. Given the growing demands for sustainability and efficient resource utilization, it is essential that every individual possesses basic knowledge about the proper handling of electrical energy. Inefficient use of electricity leads not only to unnecessary waste but also to economic and environmental losses. The authors of the article defined two main objectives: a research-application objective and a pedagogical objective. The research-application objective of this contribution is to quantify electricity consumption in a university laboratory both in overall terms and for individual specialized appliances and laboratory equipment. The output is a detailed overview of measured values, serving as a basis for analyzing energy demands and identifying potential savings. The pedagogical objective of the article is to develop students' energy literacy through practical understanding of electricity consumption in a laboratory environment, while also enhancing their technical skills in measurement, analysis, and critical evaluation of the energy demands of devices. Emphasis is placed on fostering a responsible approach to energy use, both in professional practice and everyday life, with the aim of seeking efficient and sustainable solutions. The introductory part of the article addresses fundamental aspects of energy, such as the typology of power plants, the development of energy consumption, and electricity pricing. This section provides context for the subsequent analysis of consumption in the

laboratory setting. The following section focuses on the technical principles of selected specialized appliances and laboratory equipment. Their detailed description is essential for understanding the energy requirements of individual devices and for accurate interpretation of the measured data. The article also includes an overview of methods for measuring electricity consumption, including descriptions of instruments and procedures used to measure power input. This methodological section forms the foundation for the practical implementation of measurements. The practical part includes specific measurements of power input and consumption for selected devices. The result is an overview of individual appliances and laboratory instruments, supplemented by measured values that enable comparison and identification of energy-intensive components. The final section presents a proposed energy literacy test designed for students working in the laboratory as part of practical exercises. The test is conceived as a tool to raise awareness of the energy demands of specific devices and to support the development of competencies in the sustainable use of energy.

Keywords: *Energy savings, energy literacy, measurement of electricity consumption, handling of electrical energy, typology of power plants.*

COULD YOU TEACH ME HOW TO THINK?

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Abstract
One of the core values of education, at any level, should be critical thinking. We educate students so that, with their knowledge, they can act critically in their future professional careers and in life in general. However, do we actually teach students to learn how to think? In science and engineering programs, through subjects such as Mathematics or Physics, students are trained to approach problems and to apply logical reasoning to find possible solutions. But we don't teach them to reflect on their own learning, as is done in other, more education-oriented disciplines. Experience has shown that, in general, university students do not used to stop and critically think about their own learning process. In this paper, we present how we have guided university students from various science and engineering degrees in the process of reflecting on their learning experiences and the skills acquired during Service-Learning (SL) projects. The study involves twenty undergraduate students who participated in a one-week SL activity in Morelia, Mexico. The program was integrated in an international and interdisciplinary initiative under the Erasmus+ Project G.I.R.L.S. (Generation for Innovation, Resilience, Leadership and Sustainability), which brought together students from the sciences, engineering and health sciences from the partner countries involved in the project. The activities covered a wide range of topics, from hygiene education to collaborative community-based interventions. The SL methodology includes well-defined phases: observation, preparation, action, reflection, recording, evaluation, and acknowledgments. It has been observed that, although most of these phases do not present difficulties for students, the bottleneck is during the reflection part. To facilitate the reflective process, a comprehensive guide outlining the phases of the project was first developed, together with guidelines designed to support the internalization and implementation of SL projects and their methodology. In addition, to delve deeper into the experience, reflection sessions were conducted in four stages: individual reflection, reflection in small groups, collective reflection in a large group, and a final reflection about future action, guided by selected questions. At the beginning of the process, students appeared to engage with their experiences at a superficial level; nevertheless, as the reflection activities advanced, they progressively demonstrated greater depth in their analysis and understanding. The results highlight the importance of promoting higher education environments that enable students to develop the competencies and strategies required for more meaningful engagement in their own learning processes.

Keywords: *Service-learning, critical thinking, reflection, higher education, science/engineering education.*

RECONCEPTUALIZING HUMANITIES PEDAGOGY IN CONTEMPORARY AMERICAN UNIVERSITIES: CULTURE, LITERATURE AND FOREIGN LANGUAGES IN TRANSITION

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Abstract
American universities are undergoing a significant pedagogical shift, particularly in literature, cultural studies, and foreign language programs. Rapid technological change, evolving cultural landscapes, and the educational disruptions of the COVID-19 pandemic have intensified longstanding debates about the place and purpose of the humanities. At the same time, changing student expectations, new administrative models, and the decline of strictly lecture-based instruction have reshaped how we teach, interpret texts, and define intellectual authority in the classroom. This paper situates these developments within a cross-disciplinary dialogue that connects institutional restructuring with classroom practice. Focusing on English literature, cultural studies, and foreign language instruction, it examines how cultural and linguistic interpretation, especially through themes of ethnicity, gender, migration, and multilingualism, can foster deeper literary understanding and civic awareness. Drawing from both pedagogical theory and sustained classroom experience, the study explores the intersections of curricular reform, translingual pedagogy, and institutional change. It argues for student-centered models that sustain critical inquiry, interpretive rigor, and social responsibility in today's university environment.

Keywords: *Higher education, curriculum design, inclusive pedagogy, multilingual learners, instructional innovation, institutional reform, teaching and learning, language education.*

ANALYSIS OF ACADEMIC DISCOURSE ON SUSTAINABILITY THROUGH NATURAL LANGUAGE PROCESSING (NLP)

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Abstract
This research examines the predominant conceptual frameworks in international academic literature on corporate sustainability and assesses their alignment with the principles of Environmental Education for Sustainability. Using a mixed-methods design applied to a corpus of 604 high-impact articles indexed in Scopus (2023-2024), we combined quantitative n-gram analysis through Natural Language Processing (NLP) with qualitative framing analysis. This approach enabled the identification of the most frequent terms and phrases (1, 2, and 3-word combinations), as well as the interpretation of their discursive context and underlying logic. The results reveal an academic discourse predominantly structured around corporate-financial logic. The marked prevalence of terms such as "sustainability," "company," and "corporate" among the most frequent 1-grams, together with the recurrence of bigrams like "financial performance" and "corporate social responsibility," demonstrates an approach that subordinates sustainability to management and profitability objectives. Contextual analysis confirms that these concepts are primarily framed as instruments for risk management and economic value maximization, marginalizing essential perspectives such as environmental ethics, climate justice, and planetary boundaries. It is important to acknowledge that the study is limited to English-language literature indexed in Scopus, which may exclude valuable perspectives published in other languages or regional journals. Furthermore, although n-gram analysis provides robust identification of discursive patterns, its quantitative nature requires complementary qualitative contextual analysis to adequately interpret underlying meanings. Based on these findings, the results highlight the need to incorporate "critical discourse literacy" into Environmental Education for Sustainability programs. We propose training future leaders in deconstructing the identified hegemonic narratives—which subordinate sustainability to financial logic—to foster more autonomous, critical, and systemically transformative ecological literacy.

Keywords: *Sustainability education, discourse analysis, Natural Language Processing (NLP), epistemic bias, finance and sustainability.*

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CREATIVE PARTICIPATORY ACTION RESEARCH WITH CHILDREN: A METHODOLOGY FOR TRANSFORMATIVE EDUCATION

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Abstract
This presentation introduces a five-stage participatory action research methodology that repositions children as competent knowledge producers and active co-researchers rather than passive subjects of study. Developed and tested through the "Empowering the Future" project across six schools in Mozambique, this approach offers educators and researchers a replicable framework applicable to diverse educational contexts and themes, from environmental education to peace-building and social justice. The methodology progresses through deliberate stages: (1) Preparation, exploring participants' existing knowledge, feelings, and practices; (2) Data Production, employing Photovoice techniques where children document their environments and experiences through photography and narrative; (3) Data Analysis, facilitating children's collective identification of themes and generation of critical questions; (4) Data in Action, supporting children to create dissemination materials including stories, music, and radio programs and spots; and (5) Dissemination, amplifying children's voices to reach policymakers and wider audiences. Central to this approach is its epistemological shift from viewing knowledge as static and specialist-produced to understanding it as iterative and co-produced through interactions between participants and their contexts. The methodology recognizes children's practical knowledge and lived experiences while supporting their development as researchers. It challenges deficit perspectives that position children—particularly those from marginalized communities—as lacking knowledge, instead recognizing their sophisticated understanding of complex issues affecting their lives. Practical applications demonstrate the methodology's flexibility across topics: environmental education, human rights, peacebuilding, health education, and social cohesion. The approach generates authentic engagement, produces child-led outputs with community impact, and informs evidence-based policy while maintaining ethical rigor in research with young participants. This presentation offers concrete tools for researchers and educators seeking to implement genuinely participatory approaches that centre children's agency, build transformative learning experiences, and contribute to more equitable and sustainable educational futures.

Keywords: *Participatory action research, Photovoice, children, transformative education.*

GENERATIVE AI AND THE DEEPENING OF UNDERSTANDING: A HUMAN-AI CO-THINKING MODEL FOR HIGHER EDUCATION

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Abstract
Generative AI (GenAI) is rapidly entering higher education, yet research often foregrounds risk (outsourcing cognition, plagiarism) or efficiency rather than how students use GenAI while learning. This qualitative study examines GenAI use in a liberal-arts course that paired in-class instruction with structured, out-of-class GenAI-supported reflection. After two sessions on the contemporary Kurdish question, 45 students submitted reaction papers describing how they consulted GenAI to deepen partial understanding, clarify confusion, and pursue self-generated questions without copying outputs. Inductive thematic analysis identified three recurrent functions: perspective structuring (mapping competing frames), causal clarification (probing sequences and interdependencies), and conceptual extraction (stabilising key terms before forming arguments). Reported learning gains depended on verification practices that compared AI responses with course materials and instructor cues. The paper proposes a Human–AI Co-Thinking Model that links these practices to scholarship on technology-supported education, instructor role transformation, and shifting norms of authorship, and it derives implications for instructional design, assessment, and accountable GenAI use.

Keywords: *Generative AI, deep understanding, higher education, human-AI collaboration, instructional design.*

SELF-DIRECTED LANGUAGE LEARNING TRAJECTORY: A CASE STUDY OF LANGUAGE LEARNER OF KOREAN AS A FOREIGN LANGUAGE

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Abstract
The rapid development of technology in recent decades has created digital generations who have grown up using high-tech devices as an inextricable part of their daily lives (Pedró, 2006). This generation often accesses second or foreign languages (L2) through freely available open sources from an early age, motivating their willingness to learn the target L2. As digital natives increasingly populate language classrooms, their presence has led to significant changes in L2 teaching and learning contexts. The present case study focuses on a non-heritage L2 Korean learner who self-studied Korean during his teens and was placed in the most advanced language course at a university in the U.S. The study aims to understand his self-directed learning approaches and the personal traits that propelled his language development, with the goal of deriving pedagogical implications for self-directed learners. The subject was interviewed in Korean for ten hours over one semester. Initially, he was exposed to the Korean language at age seven through his sister's interest in K-pop. Later, he developed a desire to learn Korean and began systematic study around age 14.5, utilizing online resources and vocabulary tools. His progress was facilitated by the remote learning environment during the COVID-19 pandemic. During this period, he was able to immerse himself fully in Korean, creating his own programs for language learning. Later stages included practicing through Korean media and attending university-level Korean classes. The interview revealed the digital generation's ability to use techniques in language learning, and the lack of institutional language classes did not hinder his learning motivation. Additionally, key personality traits, such as introversion and persistence, highlighted his focus on input and time management. His self-confidence and methodical approach to learning further underscored his autonomy. The findings suggest several pedagogical implications. First, learner autonomy is crucial for successful language acquisition, requiring motivation, effort, and self-awareness. Second, the self-use of techniques by the digital generation requires new approaches in language instruction. Finally, the subject's early exposure to Korean reveals the importance of community-wide language exposure activities. While the study's subject does not represent all digital natives, his experience illustrates the potential benefits of a paradigm shift in language classroom, including re-designing language courses with more individualized sessions in higher education to better serve the needs of digital generations.

Keywords: *L2 learning, self-directed learning, learner autonomy, digital generation, learner traits.*

UNDERSTANDING ATTITUDES UNDERPINNING PEER RELATIONSHIPS WITH STUDENTS WITH DISABILITIES: A META-ANALYSIS USING THE CHEDOKE-MCMASTER ATTITUDES TOWARDS CHILDREN WITH HANDICAPS SCALE

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Abstract
Since the adoption of the Salamanca Statement in 1994, the concept of inclusive education has gained global recognition. Over the past 30 years, signatory countries have implemented numerous educational policy measures aimed at promoting inclusive practices in schools. One of the main goals of inclusive education—besides providing all students with the most appropriate learning environments and opportunities to achieve their potential—is to give all children an authentic sense of belonging. This requires a socially supportive school environment and, importantly, opportunities for students with disabilities to develop quality peer relationships. The development of such peer relationships is strongly influenced by the attitudes of non-disabled students toward their classmates with disabilities. Our research aims to enhance understanding of these attitudes through a meta-analysis of results measured with the Chedoke-McMaster Attitudes towards Children with Handicaps Scale (CATCH). We examined changes in these attitudes from 1986 to the present, considering both temporal and geographic distribution, as well as the correlation of student gender, relationships with peers with disabilities, and the presence of a family member with a disability with these attitudes. A total of 40 studies were included in the research, analysing their quantitative data through weighted regression, ANOVA, and meta-analysis. Our findings reveal a

negative trend in students' average attitudes (N=18722) over the past 38 years. Both gender and having a family member with a disability show a small but noticeable positive effect on attitudes, while having a peer with a disability exerts a medium positive effect. In today's policy context that supports inclusion, our results can provide valuable guidance for educators to design effective interventions that promote inclusive education. Our findings suggest that interventions aiming to improve positive attitudes should focus on sharing knowledge about students with disabilities, so that their peers gain more accurate and relevant information. In addition, schools should create more opportunities for interaction between students with and without disabilities, allowing them to get to know each other and build friendships.

Keywords: *Meta-analysis, inclusive education, attitude, disability, CATCH scale.*

GENERATIVE ARTIFICIAL INTELLIGENCE AS A TOOL FOR INFORMATION MANAGEMENT IN HIGHER EDUCATION: AN EMPIRICAL STUDY ON STUDENT PRACTICES AND PERCEPTIONS

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Abstract
Generative Artificial Intelligence (GenAI) technologies, such as ChatGPT, are playing an increasingly prominent role in higher education, particularly in supporting students' engagement with academic information. These tools offer new possibilities for searching, structuring, synthesizing, and understanding complex materials, often altering traditional strategies of studying, note-taking, and preparing assignments. At the same time, their growing use raises concerns related to informational reliability, superficial learning, and the need for new forms of academic guidance. This study investigates how undergraduate students—predominantly enrolled in business, economics, and management-related programs—interact with GenAI tools as part of their information management practices. It explores the purposes for which these technologies are employed, students' perceptions of their usefulness and limitations, as well as their attitudes toward the ethical and educational implications of AI integration in academic work. Empirical data were collected through an online cross-sectional survey conducted in 2025, focusing on frequency of use, main academic applications, perceived benefits and risks, and expectations toward university policy and support. The findings show that GenAI use is widespread and frequent: all respondents reported using such tools at least occasionally, with 45.7% using them daily or almost daily and 20.0% on a weekly basis. Students most commonly used GenAI for searching for information, summarizing and organizing academic content, solving problems, paraphrasing or improving language, and generating ideas for assignments, while using AI to write parts of academic work was relatively uncommon. Students strongly emphasized the usefulness of GenAI for information management and learning efficiency, yet simultaneously expressed high levels of caution regarding reliability, stressing the need to verify AI-generated information and the risk of false or misleading outputs. The findings contribute to ongoing discussions on the responsible use of AI in higher education by highlighting students' evolving roles as both intensive users and critical evaluators of generative technologies. The results point to a consistent pattern of high utility combined with high caution, in which students value GenAI as an information-management tool while calling for clearer institutional norms, ethical guidelines, and targeted support. These findings are intended to inform the future development of academic policies, digital literacy training, and pedagogical frameworks that promote critical, ethical, and effective use of AI in higher education.

Keywords: *Generative AI, higher education, information management, student perceptions, digital literacy.*

INTERNATIONALIZATION AND TEACHING INNOVATION IN HIGHER EDUCATION THROUGH AN ERASMUS+ INITIATIVE

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Abstract
This paper examines the outcomes of an Erasmus+ KA220-HED cooperation partnership that fostered teaching innovation and international collaboration in higher education through active learning and service-learning methodologies. A key component of the initiative was a transnational service-learning experience conducted in Morelia, Mexico, where 20 students and 16 faculty and staff members from all partner institutions collaborated with local communities on educational, health, and sustainability projects. Quantitative and qualitative data were collected through the *Service-Learning Experience Benefit (SELEB)* questionnaire to assess perceived learning outcomes. Results showed significant improvements in students' transversal competences, intercultural understanding, and social responsibility. The findings suggest that transnational service-learning provides an effective framework for integrating internationalization and teaching innovation, supporting both professional development and student engagement. The project demonstrates how Erasmus+ cooperation partnerships can act as catalysts for pedagogical transformation, linking local action with global educational goals and contributing to the creation of inclusive, sustainable, and globally connected higher education systems.

Keywords: *Higher education, Erasmus+, teaching innovation, internationalization, active learning.*

PEER POWER IN PRACTICE: A SYSTEMATIC REVIEW OF PEER PROGRAMS SUPPORTING INCLUSIVE AND SUPPORTIVE SCHOOL ENVIRONMENTS

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Abstract
In today's multicultural and interconnected societies, as schools and classrooms become more diverse, promoting inclusive attitudes and supportive learning environments is a central challenge for education systems. Present systematic review synthesizes evidence on the effectiveness of peer programs — including mentoring, tutoring, teaching, and peer support initiatives — in enhancing inclusivity within schools. A systematic search was conducted in Web of Science, Scopus, and ERIC for studies published between 2015 and 2024, following PRISMA 2020 guidelines. No review protocol was registered. Fifteen peer-reviewed articles were included based on criteria such as implementation in general education from grade 1 to grade 12 and a clear goal of improving community, social interactions, school climate, students' attitudes, acceptance of differences, or overall inclusivity. Methodological quality was appraised using the Mixed Methods Appraisal Tool (MMAT), with most studies meeting all criteria. Findings demonstrate that peer programs are generally associated with improvements in inclusive attitudes, empathy, and community engagement, contributing to improved school climate and student well-being, while also supporting academic goals. Future research should expand the geographic scope of peer program studies and incorporate longitudinal designs to better understand their sustained impact across diverse educational contexts.

Keywords: *Systematic literature review, peer programs, inclusive education, community development, school inclusion.*

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FROM ALGORITHM TO UNDERSTANDING: THE ROLE OF AI LITERACY IN STUDENT ACCEPTANCE OF AI GRADING

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Abstract
AI grading systems are increasingly integrated into higher education, yet their acceptance cannot be taken for granted. Building on the Technology Acceptance Model for AI Grading (TAM-AIG) introduced at the 2025 END Conference, this study examines whether AI literacy, defined as structured student preparation on how large language model graders operate, functions as a scalable intervention to improve fairness and trust perceptions. A between-subjects field experiment conducted during Fall 2025 in a graduate business course employed four grading conditions and two assignments varying in stakes. Results confirm that the AI literacy intervention significantly improved perceived fairness (p = .021) and trust (p = .026); that transparency strongly predicted fairness (r = .64, p < .001); and that fairness remained the central predictor of satisfaction (r = .75, p < .001). Assignment stakes produced no significant effect on trust, but GPA moderated fairness perceptions in AI-only conditions. These findings extend the TAM-AIG framework and offer actionable guidance for institutions integrating AI into academic assessment.

Keywords: *Artificial Intelligence, AI literacy, AI grading, Technology Acceptance Model, higher education.*

CO-DESIGN WITH TIMORESE ARTISTS: PRACTICE-LED REFLECTIONS ON DESIGN FOR DEVELOPMENT IN TIMOR-LESTE

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Abstract
This paper presents a practice-led co-design project developed in East Timor with a group of Timorese artists, in 2025 coordinated by European experts in markets and design. Although the project had a twofold approach (design and markets), the current text focuses on the design outcomes of the project. Despite the Portuguese participants' cultural and historical links with East Timor, socio-cultural assumptions were not valid, as the knowledge of the local reality was narrow, the resources were scarce, the communication channels were limited, and there was a language barrier. The reality of East Timor is shaped by historical challenges and an ongoing economic crisis, where more than 41% of the population lives below the poverty line World Bank (2023). Despite this, a striving and highly dynamic community of artists has been shaping the identity of one of the youngest countries in the world. What started as a training and advisory program in brand design and product development ended as a larger and more sustainable project that included the creation of an open-source toolkit and event curation. The project engaged contemporary Timorese artists in a hybrid collaborative design process focused on brand identity and sustainable product development and businesses. The process was highly iterative, and the method combined co-creation design principles (Sanders & Stappers) and the horizontal framework of Mazzarotto's cultural synthesis, based on Paulo Freire, where designers and participants merge their expertise and local/community know-how, aiming at a socially conscious and sustainable outcomes. The project results included a collection of art-based merchandising products, a cultural event and exhibition in Dili, a catalogue, and an open source toolkit specially designed for the art community in East Timor, built from the learning process of the designers and experts. This last outcome was driven by the need for long-term follow-up mechanisms and knowledge transfer, which endangered the societal impact of this initiative. This paper argues that, in such realities, influenced by economic and social inequalities, a co-design approach should propose a more resilient approach that embeds the post-project continuity into the design process itself. By presenting the design journey, the designed products and toolkit and participant feedback, this paper also illustrates how co-design projects in a country with significant developmental challenges, but with a vibrant artistic community, should privilege situated learning, local ownership and equity over predetermined assumptions.

Keywords: *Co-design, East Timor, social sustainability, cultural synthesis, knowledge transfer.*

GAMIFICATION FOR THE STREBER-APP – ENGAGING STUDENTS IN A MODERN COMPETENCE ORIENTED ASSESSMENT APP

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Abstract
Gamification—the integration of game-related elements into non-game contexts—offers a promising approach to increasing engagement and sustained use of digital learning applications. This paper presents the gamification-enhanced redesign of the Streber App, a mobile-optimised web application implementing the CREPS method (Create, Review, Enhance, Practice, Score), which supports competence-oriented learning through structured self- and peer-assessment. Originally developed in 2020 for a media technology university course, the Streber App has since been deployed across multiple courses and used by approximately 700 students. Within the app, learners create, refine, and evaluate multiple-choice questions based on course content. Peer evaluation focuses on quality, correctness, and complexity, while high-quality contributions are selected for further practice. Each phase of the CREPS workflow is incentivised through a points-based reward system, encouraging active participation and reflective engagement. A prior quantitative evaluation demonstrated strong overall acceptance of both the method and the application but also revealed concerns regarding long-term user engagement. Interestingly, a global high-score leaderboard—although pedagogically peripheral—was consistently identified by students as a motivating feature. In response, additional gamification elements were introduced, including user levels and a weekly resetting high-score system, with the aim of fostering sustained motivation and enjoyment of use. The enhanced application was translated into English and Slovak and piloted in a plant physiology course in Slovakia. Usage data indicated distinct participation patterns, ranging from students who substantially exceeded the workload required for course completion to those who engaged only at a minimum level. Findings indicate that the added gamification features positively influence student motivation and engagement, even though only a minority of learners are willing to invest effort beyond formal course requirements. The results highlight the potential of targeted gamification to support long-term engagement in competence-oriented digital assessment environments.

Keywords: *CREPS, Streber-App, gamification, peer assessment, mLearning.*

HOW YOUNG BILINGUALS TRANSLATE STORIES: A STUDY OF LEXICAL EQUIVALENCE AND EXPRESSIVE STRATEGIES

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Abstract
This study investigates the skill of natural translation in one early bilingual respondent acquiring Spanish and Slovak simultaneously. The research focuses on lexical equivalence, semantic shifts, and the expressive value of selected lexical items in the target language during spontaneous narrative retellings. The data were collected over a 12-month period through three elicitation sessions, in which the respondent first narrated a picture-based story in Slovak and subsequently translated it into Spanish without access to the original Slovak text. All recordings were transcribed using the CHILDES system and processed through qualitative analysis based on Miko's system of expression and Popovič's communicative model of translation. The aim of the study is to examine how young bilinguals preserve or modify the expressive value of lexical items, how they choose equivalents in the target language, and what compensatory strategies they use when lexical retrieval becomes challenging. Special attention is paid to code-switching, semantic approximation, circumlocution, and the creative reconstruction of narrative elements.

Keywords: *Bilingual children, natural translation, narrative retellings, lexical equivalence, communicative model of translation.*

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THE IMAGE OF SCHOOL AT THE INTERSECTION OF THEORY AND PRACTICE IN THE DISCOURSE OF FUTURE TEACHERS

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Abstract
The aim of this presentation is to present selected findings from the two-year project Flying School of Teaching Practicum, carried out within the Science for Society programme at the Maria Grzegorzewska University in Warsaw. The project was research-and-application oriented. It involved the implementation of teaching practicum by students—future early childhood education teachers—under the supervision of academic staff in intentionally selected primary schools distinguished by their organizational, methodological, or curricular approaches. The study aimed to analyse the experiences students gained in the professional environment. The method used was participatory action research (Kemmis & McTaggart, 2005), and the research material was collected through eight focus group interviews with students participating in the project and through their reflective journals (134 in total). The analysis shows a gap between the image of modern school education constructed within the university and the realities of everyday school practice. This gap becomes visible in the areas of the organization of the teaching and learning process, the methods and forms of work used, and the way the roles of teacher and pupil are perceived. In students' statements, on the one hand, there appears fascination with innovative solutions implemented in selected schools, such as group work, project-based learning, or an emphasis on socio-emotional competencies; on the other hand, there appears a sense of helplessness in the face of entrenched organizational schemes, time pressure, the dominance of textbooks, and standard forms of work that make it difficult to implement modern teaching approaches.

Keywords: *University-school partnership, student internships, reflective practice.*

STAR WARS, JENGA AND SUSTAINABLE BUSINESS MODELS - EXPERIENCES AND FINDINGS FROM AN EU PROJECT ON USAGE OF GAME ELEMENTS IN ENTREPRENEURIAL EDUCATION

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Abstract
This article explores the implementation and effects of gamification in higher education through the G4C:NGE project. The curriculum, integrating 27 game elements and 49 game scenarios into three entrepreneurship modules, was piloted at seven European business schools, combining local and international formats and involving over 700 students. Evaluation results indicate that gamification enhances motivation, creativity, teamwork, and confidence. While gamification fosters essential skills for future entrepreneurs, challenges remain in aligning game elements with academic content and optimizing assessment. Recommendations include refining gamified methods and promoting intercultural exchange to further improve entrepreneurship education.

Keywords: *Playful learning, entrepreneurship, higher education, international project.*

EXPLORING TEACHER PERCEPTIONS OF INTEGRATING STEAM AND HOME ECONOMICS THROUGH THE STEAMKITCHEN HANDBOOK

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Abstract
The integration of Science, Technology, Engineering, Arts and Mathematics (STEAM) across school subjects supports meaningful learning and 21st-century competencies. Home Economics offers a natural context for STEAM because it links scientific, technological, mathematical and creative knowledge to everyday practices. The STEAMKitchen project (Erasmus+ KA220-HED) produced a teacher handbook of practical, food-based learning activities that connect STEAM concepts with Home Economics. This study used a descriptive, mixed-methods design to examine in-service teachers' perceptions following a one-day STEAMKitchen professional development seminar introducing the handbook. Post-event feedback from 28 teachers was collected via an anonymous online survey comprising Likert-type items and open questions addressing clarity, curricular integration, pedagogical relevance, 21st-century skills, motivation and inclusivity. Quantitative responses were summarised with descriptive statistics (means, SDs); qualitative responses were analysed thematically. Results show uniformly positive reception: teachers rated the handbook highly for practical applicability and interdisciplinary integration (e.g., STEAM integration M = 4.71), and described experienced food-based tasks (chocolate, pH and temperature experiments) as effective bridges between Home Economics and STEAM. Teachers also reported perceived gains in confidence and ideas for classroom adaptation. The seminar format, combining short theoretical framing with hands-on practice, supported teachers' readiness to adapt interdisciplinary tasks.

Keywords: *Home economics, STEAM education, interdisciplinary teaching.*

COMPLEX ASSESSMENT AND MULTIDISCIPLINARY INTERVENTION IN CHILDREN AFTER PEDIATRIC STROKE USING MYRO: SYSTEMATIC CASE STUDY

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Abstract
Background: Pediatric stroke is a rare but serious neurological condition associated with persistent motor, cognitive, and functional deficits in up to 40–70% of affected children. Technology-assisted multidisciplinary rehabilitation may improve functional outcomes; however, evidence remains limited. *Objective:* To evaluate functional changes in upper-limb motor function, manual dexterity, grip strength, graphomotor performance, and self-care abilities following a structured MYRO®-based intervention in two children with hemiparesis after pediatric stroke. *Methods:* A systematic longitudinal case-study design was applied. Two children (7 and 11 years) with confirmed pediatric ischemic stroke completed a 10-session individualized MYRO®-assisted intervention delivered over 10 weeks within a multidisciplinary rehabilitation framework. Standardized pre- and post-intervention assessments included Box and Blocks Test (BBT), Nine-Hole Peg Test (NHPT), JAMAR dynamometry, graphomotor assessment (DiaGraMo/MaTeRs), self-care evaluation (Čadová scale), and MYRO® digital metrics. Clinically meaningful change was evaluated using minimal detectable change (MDC95) and Reliable Change Index (RCI) where applicable. *Results:* Both participants demonstrated clinically meaningful improvements in manual dexterity, grip strength, graphomotor coordination, and self-care independence. Improvements exceeded MDC thresholds in key motor outcomes, and affected-limb functional use increased in both cases. *Conclusion:* Integration of interactive MYRO®-based therapy within multidisciplinary pediatric neurorehabilitation may contribute to clinically relevant improvements in motor and functional outcomes. Systematic longitudinal case monitoring represents a methodologically appropriate approach in low-incidence pediatric conditions.

Keywords: *Pediatric stroke, case study, MYRO, graphomotor skills, self-care, motor recovery.*

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USING KNOWLEDGE GRAPHS TO STRUCTURE AND SUMMARIZE INSTRUCTION IN STEM CLASSROOMS

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Abstract
In the context of 21st-century STEM education, knowledge graphs (KGs) have emerged as powerful pedagogical tools for structuring, visualizing, and summarizing complex instructional content. These structured visual representations map relationships between concepts, enabling learners to navigate abstract domains such as mathematics and computer science with greater clarity and depth. Contemporary pedagogical models position knowledge graphs not only as cognitive scaffolds but also as epistemological organizers that reflect the internal logic of STEM disciplines, thereby supporting meaningful learning and disciplinary fluency. A pilot study conducted at Kaye College of Education and Achva Academic College in Israel examined the integration of knowledge graphs into STEM instruction. At Kaye, the focus was on pre-service secondary school teacher education (N=5), where graphs were used to support pedagogical analysis and conceptual development in a Numerical Analysis course. At Achva, knowledge graphs were embedded in a Data Structures course, helping first-year undergraduate computer science students (N=9) visualize algorithmic relationships and consolidate their learning during summary lectures. Across both institutions, the instructional model emphasized four instructional principles derived from research on meaningful learning and visual knowledge representations: 1) Conceptual Organization – Structuring content around central ideas and their interrelations. 2) Cognitive Visibility – Making abstract relationships tangible through visual mapping. 3) Comparative Reasoning – Highlighting similarities and differences between concepts. 4) Reflective Integration – Using graphs to summarize and reinterpret knowledge. Preliminary findings from both colleges indicate positive effects on students' engagement, understanding, and perceived ability to articulate conceptual connections. Students reported that knowledge graphs clarified abstract ideas and supported deeper reflection. From the instructor-researcher perspective, the graphs appeared to support more focused classroom dialogue by providing a shared reference for comparison. Knowledge graphs, therefore, offer a promising framework for organizing and summarizing instruction in STEM classrooms.

Keywords: *Knowledge graphs, STEM education, epistemic representations, comparative reasoning, meaningful learning.*

DESIGNING FOR LEARNER VARIABILITY AT SCALE: A UDL-ALIGNED FRAMEWORK FOR ASYNCHRONOUS ONLINE TEACHING

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Abstract
Asynchronous online learning expands access to higher education, but it can also magnify barriers related to learner variability, accessibility, and sustained engagement. Universal Design for Learning (UDL) offers a proactive framework for addressing these challenges; however, faculty often lack practical, scalable structures that translate UDL principles into repeatable course design decisions. This paper presents a design-based, practice-informed framework for asynchronous online teaching developed at a public university through collaboration among a centralized online learning unit, the Center for Teaching and Learning, a faculty advisory board, and a pedagogy-focused community. Rather than introducing a standalone initiative, the framework enhances an institutionally adopted guided course design template by embedding explicit UDL expectations at the module level. Core design features include aligned outcomes, multiple means of representation, structured choice in engagement and assessment, and accessibility-by-design practices. The paper describes the framework's institutional context, collaborative development process, and integrated design logic, and discusses its implications for scalable, policy-aligned, and equitable asynchronous online learning.

Keywords: *Universal design for learning, asynchronous online learning, course design frameworks, inclusive pedagogy, faculty development.*

INTEGRATING ARTIFICIAL INTELLIGENCE IN CURRICULAR DESIGN FROM PRE-SERVICE TEACHERS' PERSPECTIVES: THE ROLE OF PEDAGOGICAL COMPETENCE

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Abstract
Generative artificial Intelligence (GenAI) is increasingly integrated into modern life, including education, where both students and teachers use it in various ways. This raises important questions about future educators' preparedness to utilize GenAI in key tasks like curricular design. Our research focused on the perspectives of future teachers regarding GenAI's role in educational pathways, conducted at the University of Verona within the primary teacher education program. Participants, during a course on "Active Methodologies and Didactic Technologies," designed an educational unit using GenAI tools (Eduaide.ai or Magic School AI) and reflected on the experience. Qualitative analysis revealed that while students actively engaged in quality control and structure organization using GenAI, they often found the process challenging. They recognized the importance of good prompting and believed pedagogical competence was essential to adapt activities to real-world contexts. The findings emphasize the need for teacher involvement in the GenAI design phase to enhance its effectiveness in classrooms. GenAI can support pre-service teachers by fostering creativity and streamlining lesson planning, but educators must remain critical mediators to ensure the curriculum is pedagogically sound and suitable for primary school students.

Keywords: *AI, pre-service teacher, AI literacy.*

EDUCATIONAL PROVOCATIONS IN TEACHING A FOREIGN LANGUAGE: A "SPARK CHAMBER" PROMOTING STUDENTS' CREATIVE LINGUISTIC THINKING

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Abstract
The current concept of creativity is characterized by its multifaceted nature. Creativity may be defined as a set of processes, a creative product (Cropley, 2020), and a competence (Supena, Darmuki, & Hariyadi, 2021; Kolesnikova, Bekk, & Taybe, 2022) closely interrelated with the development of communicative skills and abilities (Jones, 2020). One of them is creative linguistic thinking. Creative linguistic thinking is the ability to use language (not only native, but also foreign) in an original, flexible, and innovative way to create new meanings and communicative forms, both in written and spoken form. Language functions not only as a system of rules, but also as a means to express new ideas and generate meanings, and is integrated into the general concept of creative thinking (Jones, 2020; O. Gafour & W. Gafour, 2020). This insight presupposes the relevance of foreign language teaching practices, which would not only concentrate on the foreign language proficiency, but also emancipate the learner's creative powers. One of such ways is educational provocations (Brown, 2020). Educational provocation can be defined as a purposefully constructed context using various visual aids and written prompts, the purpose of which is to provoke possible thoughts, actions, and verbal activities of the students, motivating them to explore, think (Brown, 2020) and discuss. The research aims to reveal the relations between the educational provocation method and the development of students' creative linguistic thinking. The main research strategy is participatory action research. The research data were collected while examining the observation protocols and researcher's diaries as well as analyzing the materials gained from pupils' oral reflections. The data were analyzed while using the content analysis. The received results allow to state that the educational method of creative provocation is directly related to the development of. students' creative linguistic thinking. Moreover, the educational method of creative provocation increased pupils' curiosity and motivation to perform creative tasks and to use a foreign language actively during the lessons as there were created conditions for the students' self-expression, which revealed in the student's way of expressing their original ideas, and different use of materials.

Keywords: *Educational method of creative provocations, creativity, teaching a foreign language (TFL), creative linguistic thinking.*

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BRIDGING SECTORS IN LANGUAGE EDUCATION: A CROSS-SECTORAL COMMUNITY OF PRACTICE APPROACH TO MODERN FOREIGN LANGUAGE IMPLEMENTATION IN IRISH PRIMARY SCHOOLS

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Abstract
Recent curriculum reform in Ireland has positioned Modern Foreign Languages (MFL) as an increasingly significant component of primary education, generating new and evolving professional knowledge demands for teachers. While the Primary Language Curriculum (PLC) and Languages Connect, Ireland's Strategy for Foreign Languages in Education 2017–2026 (DES, 2017) articulate ambitions for continuity across educational phases, opportunities for sustained, dialogic and practical collaboration between primary and post-primary teachers remain limited. Responding to this gap, this study examines the defining features of an effective Cross-Sectoral Community of Practice (CCOP) designed to advance MFL teaching and learning through structured professional dialogue across primary and post-primary contexts. Guided by Communities of Practice theory, the study examines how shared inquiry, peer-observations, collaborative reflection, and reciprocal expertise contribute to teacher learning and pedagogical development. A qualitative design was employed, involving facilitated CCOP sessions with primary and post-primary MFL teachers, supported by reflective prompts and professional artefacts. Data were generated through recorded discussions, reflective journals, focus groups and expertise mapping exercises. Trustworthiness was enhanced through triangulation of data sources, reflective practice, and ongoing participant validation throughout the CCOP process. Findings indicate that effective CCOPs are characterized by relational trust, parity of professional voice, curriculum-informed dialogue, and a focus on pedagogical continuity. Participants reported increased confidence in MFL pedagogy, enhanced understanding of learner progression across curricular phases, and a strengthened sense of collective responsibility for language learning trajectories. Importantly, the CCOP functioned as a space for co-learning, co-designing of resources, challenging traditional hierarchical professional boundaries and fostering sustainable cross-sectoral relationships. The study contributes to emerging research on teacher professional learning in MFL education by identifying sustainable frameworks and design principles for effective cross-sectoral collaboration. It offers practical implications for policy, initial teacher education, and continuing professional development, particularly in systems where primary MFL provision is evolving and requires coherent, teacher-informed support structures.

Keywords: *Modern foreign languages, community of practice, cross-sectoral collaboration, curriculum reform, Irish primary education.*

THE FUTURE OF UNIVERSITY EDUCATION: TRANSFORMATION, DISRUPTION AND ADAPTATION TO 2040

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Abstract
Higher education is undergoing significant transformation driven by technological change, demographic shifts, economic pressure, and evolving societal expectations. This paper examines the future of universities toward 2035-2040, drawing on recent research and sector analysis. It argues that universities are unlikely to disappear but will persist in transformed forms through processes of adaptation. Key developments include the integration of artificial intelligence and digital learning, the expansion of alternative credentials, the growth of entrepreneurial and interdisciplinary education, and increased emphasis on student experience and public value. Universities most likely to endure will be those that preserve core functions while adopting more flexible, digitally supported, and socially embedded models.

Keywords: *Higher education transformation, artificial intelligence, alternative credentials, entrepreneurial universities, student experience.*

A DATA-DRIVEN, INCLUSIVE AND STUDENT-CENTRED MODEL FOR ENGAGEMENT, BELONGING AND SUCCESS IN HIGHER EDUCATION

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Abstract
Student engagement and continuation remain critical challenges for higher education, particularly in the post-pandemic context where traditional indicators often fail to capture the complexity of learners' experiences (Collins, Dooley & O'Brien, 2022). Many institutions continue to rely on retrospective data to identify students at risk, limiting the timeliness and effectiveness of support. This paper presents an innovative, data-driven and student-centred model designed to enhance engagement, belonging, and academic success across undergraduate and postgraduate programmes.
The model utilised weekly monitoring of virtual learning environment (VLE) activity to identify low-engaged students and facilitate targeted interventions. Initial implementation resulted in a 28% increase in online engagement during the first trimester and a 41% increase during the second trimester compared with the previous academic year. The framework subsequently evolved into a comprehensive student-success model incorporating academic-skills development, peer mentoring, and dedicated student-success coaching. Outcomes included improved submission rates, enhanced continuation, and a reduction in attainment disparities. The paper argues that combining data-informed decision-making with personalised and inclusive support can significantly improve student outcomes and strengthen students' sense of belonging within higher education.

Keywords: *Student engagement, inclusive education, data-driven intervention, continuation and progression, equity and belonging.*

FLORENCE PROJECT – DESIGNING FROM WITHIN: A LIVING LAB MODEL FOR INNOVATIVE HIGHER EDUCATION INSIDE A MEDICAL CENTER

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Abstract
The Florence Project is an academic living lab embedded inside Soroka Medical Center that relocates design education from the studio into everyday clinical life. Students spend an entire semester working in hospital wards, collaborating with staff, patients, and families while researching, mapping services, and testing solutions in real time. Rather than simulating reality, the program treats the hospital itself as a classroom and authentic constraints as learning drivers. This paper presents the Florence model as an innovative pedagogical framework for higher education and illustrates it through an in-depth case study focused on transforming the pediatric meal experience. Drawing on experiential learning, participatory design, and work-integrated learning literature, the paper argues that immersive, interdisciplinary collaboration cultivates empathy, systems thinking, and professional readiness while simultaneously producing measurable institutional impact.

Keywords: *Living lab, experiential learning, work-integrated learning, design education, interdisciplinary collaboration.*

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PREVENTION OF POSTURAL DEFECTS IN CHILDREN AND ADOLESCENTS IN PUBLIC HEALTH CARE ON THE EXAMPLE OF SELECTED EUROPEAN COUNTRIES

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Abstract
Correct body posture is one of the determinants of health and fitness. It promotes the proper functioning of the musculoskeletal system and internal organs. It is also correlated with mental well-being. Attention to so-called postural hygiene, which consists of correct posture, i.e. the ergonomic positioning of the body in static positions (standing, sitting) and during movement (walking, running, bending over to lift weights and any other everyday activity), should be a habit formed from early youth and even childhood. It seems that the school environment can play a key role here. This is all the more important because it is school-age children who are most often diagnosed with poor posture. Meanwhile, according to research conducted by scientists from Spain, Malta, Poland, Turkey and Romania, there is still much to be done in this area. Primary school teachers are often not adequately prepared and do not provide optimal education on postural hygiene. Children are not taught, using methods adapted to their cognitive abilities, the knowledge and skills that could become the basis for lifelong habits of correct posture and physical activity. In each of the countries covered by the project, the national healthcare system includes an assessment of the posture of children and young people, but the solutions adopted are not producing the expected results. Postural defects are mainly diagnosed by a family doctor, but sometimes also by a school nurse. Unfortunately, although school is the best place to provide education on postural hygiene and exercises to prevent posture defects, none of the countries surveyed has a formal (or informal) channel for communicating information between health centres, schools and parents. There is no such thing as a team focused on the well-being of children in this area. Another disadvantage is that no standardised posture assessment form has yet been developed that is clear and understandable to parents and children. The research yielded a set of recommendations to increase public awareness of the importance of correct posture for health and psychophysical well-being, with the most significant being promoting closer cooperation among families, healthcare providers, and schools. One way to improve postural hygiene among school children is to train teachers to recognize postural defects, share knowledge about the importance of proper posture for health, and conduct in-class exercises to prevent postural defects and promote physical activity. One such project is "Spine-Friendly Teacher, Spine-Friendly School" (2025-1-PL01-KA220-SCH -000350791).

Keywords: *Children's health, body posture, faulty body posture prevention, posture hygiene, health care.*

ENHANCING STUDENT ENGAGEMENT THROUGH MOVEMENT AND PROACTIVITY: A COMPARATIVE CLASSROOM STUDY USING AN ISO 26000 GAME

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Abstract
This research paper examines how classroom movement influences student engagement during the introduction of the ISO 26000 standard. Using theories of active learning and embodied cognition, this study compares a specific teaching session delivered to two distinct master's-level classes at a business school, both exposed to identical learning objectives and content, but via different pedagogical modalities. In the first instructional setting, students were seated around a single table and introduced to the key principles of ISO 26000 through a card-based game. Each student drew a card that presented one element of the standard. Although the activity incorporated an element of gamification, students remained physically static throughout the session. Observational data revealed a rapid decline in attention, motivation, and curiosity, suggesting limited cognitive engagement. In the second setting, a world café methodology was used. Multiple tables were organized, each corresponding to one of the major themes of ISO 26000. Students rotated among the tables, engaging in brief collaborative discussions at each station. In this configuration, physical movement was an integral component of the learning process. Students demonstrated higher levels of participation, curiosity, and proactivity, as well as sustained attention over time. The contrast between the two experiences highlights the pedagogical value of movement as a catalyst for engagement and learning. These findings are consistent with research on active learning (Prince, 2004; Freeman et al., 2014; Park & Xu, 2024), embodied cognition (Sullivan, 2018; Zou et al., 2025), and the role of movement in enhancing cognitive processes and motivation (Garret, 2022; Oliveras-Ortiz et al., 2020). This presentation argues that integrating purposeful movement into instructional design can significantly enhance student engagement. It invites educators to reconsider classroom spatial organization and learner posture as central variables in the learning process. It proposes movement as a powerful lever for fostering proactivity and meaningful learning.

Keywords: *Active learning, student engagement, classroom movement, pedagogical innovation.*

ALISIO - A STEAM EDUCATIONAL PROJECT BRINGING EARTH OBSERVATION TO CANARY ISLANDS CLASSROOMS

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Abstract
In December 2023, the Canary Islands launched their first satellite, ALISIO-1, into space. Since then, it has served as a testbed for innovative technologies to monitor both the short- and long-term effects of climate change in the region. Inspired by this mission, the ALISIO Educational Project was created to introduce secondary school students across the Canary Islands to the analysis of satellite imagery and its relevance in understanding and addressing real-world environmental challenges. Designed as a comprehensive STEAM initiative, the project integrates multiple areas of knowledge (science, technology, engineering, arts and mathematics) while promoting the simultaneous development of scientific thinking, eco-social awareness, and critical reasoning. This paper presents the design and preliminary outcomes of the first implementation of the ALISIO Educational Project, which aims to impact on students' scientific competence, awareness of climate and environmental issues, and motivation toward STEAM disciplines.

Keywords: *STEAM education, project-based learning, secondary school, teacher training, sustainable development.*

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FAMILY COMPREHENSIVE SEXUALITY EDUCATION EXPERIENCES AND OPINIONS FROM ADOLESCENTS AND THEIR PARENTS

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Abstract
Comprehensive Sexuality Education (CSE) is defined as a lifelong learning process that begins in childhood and is ideally based on shared educational responsibility, primarily between schools and families. In Italy, there is no law formally introducing CSE in schools as a multidisciplinary and transversal subject, in line with international documents and guidelines. Moreover, in sociocultural and political debates, many Italians advocate for parents' primary educational role, citing Article 30 of the Italian Constitution, which establishes both the duty and the right of families to educate their children. However, sexual and relational issues are often neglected by parents due to a lack of knowledge, feelings of discomfort and embarrassment, or facing personal, cultural, and social factors. At the same time, adolescents consider CSE crucial and necessary, and affirm accessing information from multiple sources, such as the web and peers. Hence, literature often reports family communication as inadequate or unsatisfactory. The present research aims to explore CSE's experiences and opinions, as well as family communication experiences, in a triadic perspective, involving Italian adolescents and their parents. The research consists of two phases: 1) a qualitative phase including semi-structured interviews with families, specifically an adolescent, the mother, and the father in each family; and 2) a quantitative phase involving the administration of an online questionnaire to adolescents, mothers, and fathers. The first phase was an exploratory study involving 50 families. The second phase is also characterized as an exploratory study that aims to reach a wider, more heterogeneous sample, enabling the conduct of statistical analysis and comparisons of experiences, opinions, and communication styles between families and Italian contexts. Overall, the present research aims to provide a deeper understanding of how families discuss sexuality and relationship issues, and how adolescents and parents position themselves on CSE topics, with the future goal of designing training and educational programs for both adolescents and parents.

Keywords: *Comprehensive sexuality education, family communication, adolescents, interviews, questionnaires.*

UPSKILLING YOUTH FOR NATURE-BASED SOLUTIONS AND GREEN ENTREPRENEURSHIP

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Abstract
The UK has made a commitment to Net Zero 2050 and the City of Edinburgh has an even more ambitious target of 2030. In addition, the UK government aims to create two million jobs by 2030, including those in environmental management and conservation, which is an expanding sector. This presentation explores the findings from participant feedback in a training programme of climate skills (British Council collaboration grants). Approximately 30 youth from Scotland and Mexico undertook the training, consisting of four workshops and a climathon (hackathon) event. All youth were defined as being between 18-35 and from a disadvantaged background and/or black and global majority. Using a climate justice framework (Walker et al., 2024), the anonymised responses of participants were analysed using inductive thematic coding (Thomas, 2006) and cluster feedback to evaluate the level of green skills knowledge they gained after each session. Reflections on the learning and cross-cultural collaboration were also analysed thematically, as well as suggested improvements to the programme. Climate emotions using a climate wheel were compared as a pre- and post- activity to the programme as a form of participatory action research (Mayes & Arya, 2024) moving from climate anxiety towards empowerment and climate justice through upskilling.

Keywords: *Green skills, collaboration, upskilling, education, youth.*

THE TRIALOGICAL LEARNING APPROACH AS A TOOL FOR SUPPORTING LIFELONG LEARNING

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Abstract
The present project aims to promote innovative educational practices for both students and organizations. The theoretical framework is centered around the Trialogical Learning Approach (TLA). This integrated model is further supported by Assessment for Learning (AfL) and Sustainable Assessment (SA). The trialogical approach acknowledges the multifaceted nature of learning by integrating "monological" processes—the individual construction of conceptual knowledge—with "dialogical" processes that emphasize social interaction, intersubjective exchange, and the collaborative production of tangible knowledge artefacts that benefit the entire community. By implementing this approach, the project aims to introduce the use of Artificial Intelligence (AI) to develop essential competencies for lifelong learning, both in the training of university students and in the professional development of individuals in the corporate environment. This paper will focus on the training experiences currently being undertaken within the organization (10 participants, duration of 6 months, 30 hours), outlining the various steps involved and the initial results achieved.

Keywords: *Trialogical Learning Approach, artificial intelligence, lifelong learning, corporate professional, university students.*

IMMERSIVE PEDAGOGY AND EMBODIED DATA: IP AND PRIVACY RISKS IN EUROPEAN EDUCATIONAL METAVERSES

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Abstract
Immersive and metaverse-like learning environments are increasingly discussed as emerging infrastructures for higher education, particularly in relation to virtual laboratories, simulations, collaborative learning, and avatar-mediated interaction. Yet their pedagogical potential is accompanied by a complex legal and governance landscape. On the one hand, these environments operate as persistent spaces of content production, modification, and circulation, where students, teachers, institutions, and platform providers may all become implicated in questions of authorship, co-authorship, licensing, attribution, portability, and downstream reuse. On the other hand, immersive systems intensify privacy concerns because they enable the collection of dense streams of behavioural and potentially biometric data, including gaze, posture, voice, gesture, and interaction traces, from which highly sensitive inferences may be drawn. This paper argues that, in European educational metaverses, intellectual property and privacy should not be treated as distinct regulatory domains, but as interdependent dimensions of the same socio-technical infrastructure. To develop this argument, the paper proposes an analytical matrix structured around four stages of immersive learning activity: creation and remix of artefacts, platform hosting and moderation, recording and reuse for teaching and assessment, and data extraction for analytics. The framework is then applied to two scenarios: a virtual laboratory based on collaborative 3D creation and an avatar-mediated learning environment with monitoring functions. The analysis shows that the same contractual and technical affordances that organise authorship and reuse also facilitate persistent tracking, data retention, and secondary processing. The paper concludes that European educational institutions should assess immersive learning environments not only as pedagogical tools, but also as infrastructures that simultaneously distribute creative control and intensify data capture.

Keywords: *Educational metaverse, intellectual property, data protection, copyright, XR privacy.*

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WATER RISK: AN EDUCATIONAL GAME TO SPREAD GOOD PRACTICES FOR MITIGATING NATURAL RISKS

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Abstract
Water Risk is a serious game developed as an evolution of the multi-hazard board game *Risk Detective* dealing with hydrogeological and seismic hazards (https://riskdetective.wordpress.com/cose-risk-detective/). This new educational tool, addressed to schools and carried out by the Istituto Nazionale di Geofisica e Vulcanologia (INGV), aims at mitigate the tsunami risk. This game completes the *Risk Detective* series with a specific learning path on tsunami risk. *Water Risk* involves secondary school students in the game design and in the testing phase, in a participative approach. Guided by INGV researchers, students create trials and quizzes to realize a meaningful game to be used with primary and secondary school students. To win *Water Risk* game, all the competitor teams of students have to make the right safety choices in cooperative way, enforcing their *problem solving* ability and *critical thinking* in case of tsunami. The resulting educational tool will be tested during special scientific events. In these occasions *peer education* experiences will be conducted by the secondary school students involved in the game design, with researchers as scaffolders. *Water Risk* concludes the trilogy of *Risk Detective* educational games, all aimed at the *transformational learning* purpose, by clarifying the importance of distinct and correct behaviors to face different natural risks (earthquakes, tsunamis, floods and landslides). This *game-based learning* activity promotes the development of *safe life skills* in the frame of *lifelong learning*. The tested and revised version of *Water Risk* will be freely downloadable for an effective dissemination on tsunami hazard understanding to instill best practices of Civil Protection and to prepare future citizens to be responsible and aware for a safer society.

Keywords: *Educational game, tsunami risk, safe life skills, transformational learning, lifelong learning.*

ECOLOGICAL IMPERATIVE AND CO-EVOLUTIONARY EDUCATION THROUGH METHODOLOGICAL SYNTHESIS

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Abstract
Modern higher education requires a strategic shift toward student-centered and competence-based approaches, as emphasized by the Bologna Process and recent EHEA communiqués. A critical challenge remains the formation of educational content that bridges the gap between fundamental theories and professional practice. This research, supported by the Institute for Human Sciences (IWM) under the Documenting Ukraine grant, proposes an integrated approach to modernize environmental education, specifically through the lens of regional water security. The study's objective was to create an effective didactic system that systematizes knowledge of natural-science theories while addressing urgent global and, crucially, regional water problems. For listeners, the issue of water security is particularly valuable when examined through a regional perspective, as it allows them to connect abstract global Sustainable Development Goals with the tangible ecological state of their own local basins and communities. The "Water Security" course serves as a primary example, integrating international water policy with regional environmental management into a cohesive module. The methodology employed included component analysis of ecological knowledge, educational experiments, and mathematical statistics to evaluate the completeness of knowledge acquisition. By focusing on regional cases—such as the pollution of local rivers or the depletion of water—students develop a co-evolutionary worldview and a deeper sense of professional responsibility. This localized approach ensures that the "ecological imperative" becomes a practical guide for future specialists rather than a theoretical concept. The essence of methodological synthesis in the content of education is to create a holistic didactic system that not only combines knowledge from different disciplines, but also ensures their interaction at the highest level - through the coordination of fundamental natural science theories, basic categories and principles. The study involved three years of experimental validation with over 600 listeners, demonstrating high didactic effectiveness. Results showed that students achieved an average knowledge acquisition coefficient of 0.85, significantly exceeding the satisfactory

threshold. The integrated approach was implemented across three levels: internal disciplinary, interdisciplinary, and methodological synthesis. In conclusion, the integrated approach to "Water Security" not only improves the quality of professional training but also fosters environmental stewardship. By emphasizing the regional dimension of water problems, this model helps students master the complex international and local dimensions of environmental policy. Future research will focus on improving assessment methodologies for these integrated modules to ensure the continuity of educational objectives in a changing global climate.

Keywords: *Ecological imperative, co-evolutionary worldview, methodological synthesis, environmental responsibility, knowledge acquisition.*

THE SIGNIFICANCE OF MISSION STATEMENTS IN HIGHER EDUCATION INSTITUTIONS FOR DEVELOPING DISTANCE EDUCATION PROGRAMS

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Abstract
Purpose: This study examines how higher education institutions (HEIs) align their mission statements (M.S.s) with distance education (D.E.) and the Sustainable Development Goals (SDGs), with emphasis on SDG 3 (Good Health and Well-being) and SDG 4 (Quality Education). *Background:* As distance education (D.E.) reshapes higher education, mission statements have emerged as critical instruments for signaling institutional alignment with access, sustainability, and the Sustainable Development Goals. Higher education institutions face increasing pressure to demonstrate mission-driven effectiveness in distance education and measurable commitment to the SDGs. Examining the alignment of mission statements with SDGs 3 (Good Health and Well-being) and 4 (Quality Education) provides a timely lens for evaluating institutional priorities, public accountability, and the operationalization of quality education and well-being through distance education initiatives. *Key Points:* Using secondary document analysis, the study evaluates how mission alignment influences the effectiveness and performance of distance education programs. The research explores the role of mission statements as strategic instruments for advancing inclusivity, equity, sustainability, and innovation in distance education. Findings provide institutional leaders with a transparent framework for developing forward-thinking, inclusive mission statements. This study contributes to understanding how clearly articulated mission statements support sustainable, accessible, and effective distance education initiatives. *Procedure / Methodology:* This qualitative study applies content analysis to mission statements from fifty (50) SACSCOC- accredited higher education institutions (HEIs) offering distance education. Deductive and inductive coding, supported by computer-assisted qualitative data analysis software (WordStat and QDA Miner), was used to identify themes, keyword frequencies, and semantic patterns related to distance education and SDGs 3 (Good Health and Well-being) and SDG 4 (Quality Education). Guided by Pearce and David's Nine Critical Components (NCC) and Rogers' Diffusion of Innovation (DOI) theory, the study evaluates institutional alignment with innovation adoption, quality education, and commitments to health and well-being. *Description Study/ Findings:* The study analyzes randomly publicly available mission statements from fifty (50) Southern Association of Colleges and Schools Commission on Colleges (SACSCOC)-accredited higher education institutions offering distance education programs. Findings indicate that mission statements strongly emphasize access, learning, service, and community engagement, reflecting an implicit alignment with SDG 4 (Quality Education), yet make only limited explicit reference to distance education or the SDGs. NCC analysis showed strong representation of customers and products/services, with underrepresentation of technology, employee concerns, and sustainability. Although innovative language aligned with DOI attributes, it rarely reflects implementation, with significant differences across institutional sectors.

Keywords: *Distance education, mission statements, higher education institutions, sustainable development goals, and institutional alignment.*

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ASSESSMENT OF AI IMPACT ON LECTURES AND THESES IN UNIVERSITY EDUCATION

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Abstract
Since the release of ChatGPT, generative AI has become more and more important almost in all areas in society, which includes university education. How can AI support professors in teaching and students in their preparation of thesis? How can the interactions be improved in an AI world between professors and students? To answer these two research questions, two lectures have been evaluated with different AI focus: 1) Management of modern technologies with focus on group workshops in which students discuss virtual in breakout sessions by using and avoiding AI; and 2) Digital transformation with focus on individual preparation of project documents to presentation in video according to Elevator Pitch method. Each of 2 typical Master and bachelor theses have been assessed regarding AI helps and differences of quality. The results of this paper recommend the critical but selective and comparative use of AI both in lectures and theses to enhance the interaction between professors and students in universities.

Keyword: *University education, AI, lectures, theses, interactions.*

EXPLORING THE UTILITY OF EXTENDED REALITY IN RURAL MEDICAL EDUCATION: A PROGRAMMATIC RESEARCH SYNTHESIS

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Abstract
Extended reality (XR), including virtual reality (VR), mixed reality (MR), and 360° video, has emerged as a promising approach for enhancing simulation-based medical education (SBME), particularly in rural and distributed healthcare settings where access to training is limited. This paper reports on a programmatic research synthesis to integrate findings from a series of related studies examining the development, implementation, and evaluation of XR technologies for neonatal resuscitation and rural healthcare education. The synthesis included five studies conducted within a coordinated research program using complementary qualitative, quantitative, and development methodologies. Participants across studies included physicians, nurses, respiratory therapists, and allied health professionals. Data sources included interviews, surveys, pre- and post-tests, performance assessments, and observational data. Four overarching themes emerged from the synthesis. XR technologies demonstrated strong educational value, with VR simulation improving confidence, perceived usefulness, and performance in neonatal resuscitation skills. XR environments enhanced immersion and experiential learning, with participants reporting strong presence and engagement. XR technologies improved access to training, particularly for rural healthcare providers, by reducing travel requirements and supporting flexible, repeatable learning opportunities. Implementation challenges included technical limitations, infrastructure requirements, and the absence of tactile feedback. Overall, findings suggest that XR technologies offer a promising complementary modality for SBME and continuing professional development (CPD). XR-based approaches may enhance access to training, improve learner engagement, and support skill development in rural healthcare settings. Further research is needed to examine long-term educational outcomes and implementation strategies across diverse healthcare environments.

Keywords: *Extended Reality (XR), Head-Mounted Display (HMD), Simulation-Based Medical Education (SMBE), medical education, rural education.*

DESIGNING A TEACHER DEVELOPMENT MOOC CAMP TO PROMOTE ANTI-RACIST EDUCATION

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Abstract
In Brazil, there are at least two laws that prescribe the teaching of Afro-Brazilians' and Brazilian Indigenous peoples' cultures and histories at schools: law 10.639/03 and law 11.645/08. However, although these laws are about 20 years old, they have not been thoroughly implemented yet. Studies (Dias, 2024; Figueiredo, 2025) have pointed out that one of the reasons for this failure has been the fact that teachers do not feel well-prepared to implement them. While some of these teachers mention that they do not know how to adapt the curriculum, others not even know or understand exactly what the laws are about. Therefore, this participatory action research (Kemmis & Wilkinson, 2011; Cardoso, 2023) aims at finding effective ways of implementing these laws. The idea is not simply to prescribe activities, but to understand collaboratively what could be done to minimize the problem. To do so, we have been developing a series of activities, including a MOOC camp, which consists of an on-line course with weekly sessions for discussion (Cardoso, 2021, 2022), to be used for sharing readings and videos about the topic and as a kind of repository of materials developed during the two-month camp. This MOOC camp is being prepared by a group of graduate and post-graduate students who are (future) language teachers. The on-line course is divided in six modules based on the series of lectures *Towards an Anti-Racist Basic Education,* which were organized by our research group in 2023. The theoretical framework of the research includes discussion on anti-racist education (Cavaleiro, 2001), Critical Racial Literacy (Ferreira, 2015, 2017) Critical Applied Linguistics (Pennycook, 2021; Pennycook; Makoni, 2020; Rajagopalan, 2003; Silva; Pereira, 2022) and critical-reflective teacher development (Cardoso, 2024, Celani, 2002; Freire, 1998/1996; Liberali, 2015; Liberali; Carrijo, 2024). As it is a long-term ongoing study, there are no final results, but project assessment is constant and some of the findings will be discussed during the oral presentation.

Keywords: *Anti-racist education, critical racial literacy, critical-reflective teacher development, MOOC camps.*

MANAGING RELIGIOUS DIVERSITY IN PRIMARY SCHOOLS: EDUCATORS' PERSPECTIVES ON INCLUSION, BELONGING AND SCHOOL CLIMATE

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Abstract
School climate and students' sense of belonging play a central role in educational inclusion, particularly in culturally and religiously diverse contexts. This qualitative study examines how educators in Greek primary schools perceive and manage religious diversity, with a focus on the inclusion of Muslim pupils. Drawing on interviews with teachers, school principals, and religious instructors in the region of Thrace, the study explores everyday practices, challenges, and coping strategies related to religious education and school rituals. Findings reveal considerable variation in how schools organize exemption procedures, learning activities, and participation in religious events, often depending on local decision-making rather than unified guidelines. Educators express concern that inconsistent practices may unintentionally affect pupils' emotional security and sense of belonging. At the same time, many participants describe deliberate efforts to promote respectful dialogue, inclusive classroom climates, and positive peer relationships. The study highlights the psychological dimensions of inclusion, emphasizing how organizational clarity, professional confidence, and supportive school leadership contribute to a climate where diversity is managed constructively. Implications are discussed in relation to inclusive school environments and educator support.

Keywords: *Educational inclusion, religious diversity, school climate, sense of belonging, primary education.*

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TOUCHING THE SOIL, CULTIVATING A COMMON HOME: A LIVED EXPERIMENT IN REGENERATIVE EDUCATION

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Abstract
This proposal recounts the experience of establishing a volunteer-led community garden founded in April 2023 on a university campus in Madeira. Born from a felt need by a diverse group of students and teachers, our aim was to find a physical home for a learning community dedicated to ecological and social issues. The objective is to explore how the campus space can function as a collaborative "third space" that nurtures regenerative agriculture, interdisciplinary exchange, and social cohesion through shared experience. In our weekly co-creation sessions, we meet as a mixed group of students, teachers, and neighbors to navigate a fluid process of learning together. We embrace a horizontal dynamic where research occurs through experiments, failures, and the repetitive act of returning to the same soil every week. Activities range from artistic workshops and practical tasks to the conscious decision to deconstruct the pressure to produce: the garden is a place to work, but also to rest, do nothing, and simply observe. By physically creating this Common Space, we observe the dynamics between environmental care and our own well-being, transforming the garden into a tool for ubiquitous and continuous learning. Reflecting on our shared experience as volunteers, one of our most vital findings is the value of rest and connection. We experience the garden as a safe space where the pressure to constantly produce is replaced by a culture of mutual care. We observe that "getting our hands dirty" facilitates conversations that rarely happen in seminar rooms, as shared manual tasks lower social barriers. Furthermore, the process of regenerating the land and the permission to make mistakes fosters a tangible sense of belonging and purpose. Transversal skills such as observation, patience, problem-solving, and interdisciplinary teamwork are thus cultivated alongside flowers, aromatic herbs and vegetables. With this project, we explore the idea that pedagogic quality does not always require high-tech tools; sometimes, it requires a hoe and compost. Through this lived practice, we embody principles of regenerative education, cultivating sustainability rooted in shared responsibility for our common environment. Ultimately, the garden is not merely an aesthetic choice or a leisure activity, but a supportive instrument for sustainable developments in education, positioning itself as an infrastructure for a resilient, interdisciplinary, and healthy shared future.

Keywords: *Community garden, learning community, regenerative practice, public space, salutogenic design.*

DEVELOPING WORK-RELEVANT DIGITAL COMPETENCIES IN RURAL SECONDARY EDUCATION: INSIGHTS FROM HOMA BAY, KENYA

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Abstract
The growing demand for digitally competent employees in rural Kenya contrasts sharply with the limited technological resources and digital training capabilities in rural schools. While Kenya's Competency Based Curriculum (CBC) represents an important government initiative to integrate digital skills into education, its implementation faces significant challenges in rural areas where schools struggle with insufficient ICT infrastructure, limited teacher digital competencies, and minimal student access to technology. This mixed-methods study examines the critical gap between industry requirements and educational capacity in Homa Bay County, investigating how these limitations impact workforce readiness and local economic development. The study addresses four central research questions: (1) What is the gap between industry-required digital competencies and existing digital skills among teachers and students in rural schools? (2) How do current ICT competency levels compare against the DigComp framework? (3) What barriers and opportunities affect the development of work-relevant digital competencies? (4) What strategies could address these challenges? The research draws on data collected across three secondary schools and ten local industries. The methodology combined surveys of teachers' and students' digital competencies aligned with the DigComp framework, industry needs analyses, technical assessments of school ICT infrastructure, and an analysis of CBC implementation challenges. Results reveal significant

misalignments between CBC objectives, current educational capacities, and industry needs, including how the digital competency gap affects both CBC implementation and workforce development in rural contexts. Accordingly, a digital teaching strategy was implemented combining solar-powered ICT infrastructure, low-energy digital devices, and a structured teacher development programme aligned with both DigComp and CBC requirements. The strategy emphasises practical applications through Learning and Work Tasks integrating real-world industry problems.

Keywords: *Digital competencies, work-based learning, rural education, teacher development, educational technology.*

INTEGRATING LIVING LAB WEBINARS INTO UNIVERSITY TEACHING FOR DIGITAL AND SUSTAINABLE OPERATIONS

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Abstract
This communication presents an innovative teaching experience based on the design and implementation of a webinar (online seminar) linked to a Living Lab research project focused on the digitalisation of greenhouse agriculture. The activity was mainly addressed to university students at the University of Almería (Spain). The live (synchronous) version of the webinar was held with students enrolled in the course Quality and Environmental Management, and Business Administration. The objective was to bring into the classroom a real-life case illustrating the application of digital technologies in production contexts and operations management. The session was recorded for later use (asynchronous) in other degree programmes, thereby increasing its dissemination, reaching around 120 views. The webinar was developed within the framework of the CODECS project (Horizon Europe) and provided an applied demonstration of how data interoperability, monitoring systems and decision-support tools contribute to improving operational efficiency and environmental sustainability in complex production systems. Through interaction with researchers, technicians and Living Lab professionals, students engaged with real operational challenges in intensive greenhouse agriculture and collaborative innovation processes. Unlike conventional webinars, the activity was fully embedded in the curriculum and combined real data, stakeholder interaction and structured academic reflection within an ongoing research project. The experience was designed to strengthen applied learning by connecting previously delivered theoretical content with a practical case of digital transformation. The Living Lab approach was introduced as an innovation and learning environment under real conditions, where technologies are tested and improved in collaboration with multiple stakeholders, including farmers, technicians, researchers and students, emphasising co-creation and real-world problem solving as core pedagogical elements. Specifically, the activity sought to complement traditional lecture-based teaching through applied research-based learning, enabling students to observe the practical relevance of concepts addressed in class. It aimed to facilitate students‘ understanding of the role of Operations Management in resource-intensive environments, emphasising efficiency, productivity and sustainability as key managerial competences. Furthermore, it introduced digitalisation and data interoperability as essential elements for the integrated management of operations, quality and environmental performance, reinforcing a systemic and information-based approach to decision-making. From an academic perspective, the webinar format encouraged active learning, critical thinking and analytical skills through direct contact with professionals and real data, fostering student engagement and development of transversal competencies. The data were collected through a structured Google Forms questionnaire completed by 119 participants and analysed using descriptive statistics, including Likert-scale items and basic comparisons between groups (live vs. recorded), complemented with questions related to the recorded session. The results revealed increased motivation and a better understanding of digital transformation and sustainability, supported by consistently high mean scores across all evaluated dimensions. The study analyses the potential of ‘Living Lab’ experiences delivered via webinars as innovative, transferable and replicable teaching strategies in higher education.

Keywords: *Learning, sustainability, digitalisation, agriculture, interoperability.*

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RETHINKING ONLINE STEM "BEST PRACTICES": EVIDENCE FROM A HISPANIC-SERVING INSTITUTION

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Abstract
Despite rapid growth in online higher education, evidence-based guidance for online STEM instruction remains fragmented, especially in Hispanic-Serving Institutions (HSIs). This article synthesizes findings from a National Science Foundation-funded mixed-methods project at a public Hispanic Serving Institution in the U.S. Southwest. Guided by a theoretical lens that foregrounds social presence, cognitive presence, and student readiness, the evidence base combines a cleaned Spring 2023 student survey dataset (N = 1,256 overall), 58 usable faculty surveys, descriptive project analyses, 12 faculty interviews, 12 student focus groups, and the peer-reviewed articles that emerged from the grant. Because the published papers used different inclusion rules and theme-specific subsamples, analytic Ns vary across individual findings. Across sources, three conclusions were consistent. First, STEM students valued structured and content-linked practice more than generic interactivity. Second, disciplinary differences were large enough that one-size-fits-all guidance was unreliable. Third, equity-oriented design depended less on lowering expectations than on increasing transparency, instructional presence, and coherent practice opportunities. Students did not favour minimizing lecture altogether; rather, they preferred substantial weekly lecture time when content was clearly organized and segmented. They also rated instructor-designed rehearsal, such as study guides, practice quizzes, and automatically graded practice problems, more highly than optional or loosely connected engagement tasks. Online testing was viewed as less anxiety-producing than in-person testing, but its credibility still depended on alignment among question design, timing, rehearsal, and feedback. Online labs showed promise, especially in hybrid or carefully targeted formats, but remained more context-sensitive than lectures or rehearsal. The article concludes with implications for faculty development, course design, and future implementation research, with lessons relevant both within and beyond U.S. HSI settings.

Keywords: *Online education, STEM education, active learning, Hispanic-Serving Institutions, equity in higher education.*

FROM FIELD TO FEED: A SOCIAL NETWORK ANALYSIS OF A PHYGITAL EXPERIENTIAL LEARNING CASE IN HIGHER EDUCATION

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Abstract
The digital transformation of higher education requires innovative pedagogical models that bridge the gap between physical experiences and digital reflection. This study explores the role of the Teaching Learning Centre (TLC) at the University of Palermo as a strategic driver for "*onlife*" didactics. Central to this approach is the evolution of the educational visit through an innovative framework of experiential pedagogy. By connecting physical territory with digital interaction spaces, the project creates a "phygital" learning environment where students move from the field to the social media feed. Utilizing Social Network Analysis (SNA) via NodeXL, we analysed the communication dynamics of a joint didactic visit involving the Universities of Palermo and Coimbra. Results demonstrate that while institutional nodes act as primary hubs (Star Topology), gaining high levels of visibility within the institutional community from Meta Analytics, the digital re-elaboration of the experience not significantly effected peers' relation, although promoting students perceived self-efficacy and professional identity.

Keywords: *Educational visit, experiential learning, phygital, onlife perspective, teaching learning centre.*

INCLUSIVE EDUCATION AND NETWORK-BASED TRAINING: THE DEVELOPMENT OF A PEDAGOGICAL GUIDE WITHIN THE INTEGRAR PROJECT (UERJ)

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Abstract
The *Integrar Project – Training and Care as Tools for Inclusion and Social Transformation* is a university extension initiative developed by the State University of Rio de Janeiro (UERJ), in partnership with the Rio de Janeiro State Secretariat for Social Development and Human Rights. The project aims to promote social inclusion, psychosocial care, and continuing education for public-sector professionals, with a particular focus on families living in situations of social vulnerability and on children and adolescents with neurodivergent profiles. Grounded in an intersectoral, territorialized, and rights-based approach, the initiative articulates actions across the fields of education, health, and social assistance. From a pedagogical perspective, the project is structured around the inseparability of teaching, research, and extension, adopting action research as its central methodological framework. Between July and December 2025, the project implemented academic and educational activities—including seminars, training workshops, and case studies—aimed at the humanized qualification of public service professionals, particularly those working in education. These actions focused on strengthening qualified listening practices, supporting the ethical identification of situations involving violence, neglect, and psychological distress, and enhancing intersectoral referral and care networks. One of the project's main pedagogical outcomes was the development of the guide "Conhecer para Incluir", conceived as a practical educational tool to support professionals working in public service networks. Developed through an interdisciplinary and participatory process, the guide provides accessible guidance for inclusive pedagogical practices, the welcoming of neurodivergent children and adolescents, and the strengthening of intersectoral protection networks. The project's partial results indicate that Integrar is consolidating itself as a relevant extension experience, reaffirming the role of public universities in the production of socially grounded knowledge and in the strengthening of inclusive public policies.

Keywords: *Inclusive education, social protection networks, intersectorality, action research, university extension.*

FOSTERING MENTAL CLARITY AND INTUITIVE THINKING IN THE DIGITAL AGE: RESULTS FROM AN INTERCULTURAL MENTAL TRAINING PROGRAM

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Abstract
In the era of the "attention economy," adults increasingly encounter cognitive overload, attentional fragmentation, and diminished capacity for sustained reflective thinking. While mindfulness practices are widely explored, the potential of structured philosophical thought-trainings combined with contemplative methods remains underrepresented in adult educational research. Phenomenological epistemological frameworks offer valuable resources for cognitive and emotional development, yet their abstract nature often limits accessibility. This paper presents results from an annual, seven-month Intercultural Mental Schooling Path (IMSP). The program aims to cultivate critical thinking, inner freedom, emotional stability, and intuitive cognition through a structured engagement with the epistemology of freedom. The study investigates whether a meditative, socially embedded approach to philosophical texts contributes to mental clarity, internal coherence, and intercultural openness among adult learners in a global context. The IMSP follows a blended-learning design that integrates daily individual contemplative practice, digital learning tools, and peer-based social learning. Participants work with 627 curated "thought-cards" derived from *The Philosophy of Freedom* by Rudolf Steiner, which systematically guide reflection on autonomy in thinking and action. Program effects were examined through retrospective surveys focusing on perceived cognitive,

emotional, and spiritual development. Ongoing longitudinal analyses include standardized instruments measuring spiritual well-being (FACIT-Sp-12), openness to experience (IPIP-OtE), and internal coherence (ICS). Since 2020, 1,926 participants across eight languages have completed the program, forming a global learning community. This contribution presents data from Cohort 2023–2024 (n = 557, six languages). Post-intervention evaluations from this cohort (n = 142) indicate substantial self-reported improvements in broadened thinking (74%), gaining new insights (81%), increased mental clarity (67%), and enhanced concentration (51%). Qualitative data further suggest greater openness and reduced prejudice in social interactions. The findings suggest that operationalizing abstract epistemological concepts into structured, contemplative daily practice may constitute an effective approach within adult education. IMSP illustrates how digital tools, blended-learning formats, and peer-supported reflection can renew phenomenological philosophical training in a secular educational context. The program provides a scalable framework for fostering cognitive autonomy, emotional stability, and intercultural competency, and contributes to the empirical exploration of philosophy-based mental training within lifelong learning and mental health research.

Keywords: *Philosophy of Freedom, metacognition, mental health, mental training, critical thinking.*

THE IMPACT OF FLUENCY AND PERCEIVED SOURCE ON CONFIDENCE AND COMPREHENSION IN AI-GENERATED BUSINESS CONTENT

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Abstract
This paper examines how textual fluency and perceived AI authorship shape confidence, metacognitive calibration, and comprehension in business contexts. Generative AI tools such as ChatGPT produce business content that is typically high in fluency: clear, coherent, and easy to process. Research on the fluency heuristic demonstrates that processing ease inflates perceived knowledge (Alter et al., 2007), contributing to the illusion of explanatory depth (Rozenblit & Keil, 2002). Concurrently, emerging work shows that labeling content as AI-generated shapes credibility judgments and message evaluation, even when the underlying text is held constant. Together, these streams suggest that fluency and perceived authorship may systematically bias confidence, trust, and comprehension in business and educational contexts. Study 1 (N = 249) tested whether AI-assisted answering of knowledge questions inflates self-assessment relative to reading and unaided recall. Confidence rose in parallel with accuracy across conditions (Control = 4.10, Reading = 6.10, AI-assisted = 6.53; $p < .001$), but contrary to the overconfidence account motivating this research, AI assistance did not inflate calibration on any measure: Calibration Gap, $F(2, 245) = 1.32$, $p = .269$; Estimation Bias, $F(2, 245) = 2.07$, $p = .128$; and high-confidence error rate, $F(2, 185) = 1.55$, $p = .215$, were all non-significant, with all groups exhibiting underconfidence rather than overconfidence. Instead, a previously underspecified dissociation emerged: AI-assisted participants matched Reading participants on accuracy but reported significantly lower perceived understanding (M = 3.23 vs. 4.03, $p = .001$). This understanding penalty was binary rather than dose-dependent, as a single AI-assisted question produced the full effect (b = -0.03, $p = .668$). Building on these findings, Study 2 employs a 2 (Source Label: AI vs. Human) x 2 (Fluency: Fluent vs. Disfluent) between-subjects design with 100 to 120 MBA, MSA, and MSM students. Core content is held constant while fluency is manipulated through readability and phrasing, and perceived authorship through labeling. Participants report their perceived understanding, complete a comprehension assessment, evaluate trust in the content and source, and indicate their engagement intentions. Two-way ANOVAs will test main and interaction effects across perceived understanding, objective comprehension, trust, behavioral intention, and a calibration gap index. It is hypothesized that fluent content will increase perceived understanding, that AI source labeling will reduce trust, and that fluent AI-labeled content will produce the largest calibration gap. These two studies advance understanding of metacognitive bias in AI-mediated environments and offer practical guidance for transparent AI-assisted business communication.

Keywords: *Fluency heuristic, AI-generated content, metacognitive calibration, source credibility, business education.*

CHILDREN'S NARRATIVES OF BELONGING – A PARTICIPATORY ARTS-BASED STUDY IN DIVERSE SCHOOLS IN ENGLAND

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Abstract
The stories people tell about themselves and others, about who they are and where they belong, remain contentious and ongoing issues in education. Recent shifts towards child-centred pedagogies and inclusive practices highlight the importance of understanding how children themselves make sense of belonging. The value of listening to children's voices has been well established in the past decades. There also remains limited research into the experiences of children from migrant backgrounds in the UK, as most studies have focused on older children or those entering adulthood. Scholarship has centered on theoretical frameworks or school-focused strategies for 'achieving' a sense of belonging. The perspectives and experiences of migrant children remain underexamined. This presentation is based on a participatory, arts-based project exploring children's experiences of belonging and inclusion in school and their wider lives. The aim of the project was to investigate the interconnectivity in discourses on identity, otherness, belonging and inclusion – I am interested in how children experience, perceive, and contest these spaces. The project involved 27 children aged 10-11 in two diverse primary schools in England. A multi-methods approach was utilised, including focus groups, painting/drawing, storyboarding, co-analysis pinboards, and dance/drama performances. The findings indicated that children's narratives on belonging are expressed, defined, and contested in multiple ways, enmeshed in material and symbolic relationships with people, places, and objects. One key aspect I will discuss is how the personal and immediate objects in children's lives formed a part of their understandings of belonging, which raises questions about how children form attachments with classroom spaces. Furthermore, sites of 'differences' sometimes caused a sense of otherness but also formed opportunities for friendships and belonging to emerge. This presentation aims to contribute to the conversations around belonging in childhood, presenting a model of belonging that reflects the embodied, material, affective and political realities of belonging in children's school lives, and suggests implications for school practices.

Keywords: *Belonging, childhood, voice, migration.*

THESIS BUDDY – GENERATIVE ARTIFICIAL INTELLIGENCE IN THESIS SUPERVISION

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Abstract
This paper aims to explore how generative artificial intelligence (GenAI) can support master's thesis (M.Sc.) supervision in higher education (HE), particularly by reducing repetitive guidance and improving access to institution-specific information. Specifically, it focuses on the use of a recently developed AI chatbot, *"Thesis Buddy"*, designed to supplement traditional supervision by providing continuous, on-demand support to students. Accordingly, the paper presents an exploratory study of design and early user experiences with *"Thesis Buddy"*, conducted as a Design Science Research (DSR) in a HE context. The chatbot utilizes document retrieval and large language models (LLM) to answer student queries based on internal university documents and selected external sources, while offering citations and administrative oversight. The results show that although students continue to prefer human supervision, they perceive *"Thesis Buddy"* as educationally valuable for basic, procedural, and institution-specific questions related to the thesis process. At the same time, the findings highlight challenges related to usability and the need for a clearly articulated pedagogical role. This study contributes to educational research and practice by providing design-oriented insights into how GenAI tools can be pedagogically integrated into supervision processes, supporting scalable guidance, knowledge transparency, and informed educational decision-making in HE.

Keywords: *Generative Artificial Intelligence, chatbot, thesis supervision, computer assisted learning, design science research.*

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CSI-POM: EMPOWERING OCEAN LITERACY THROUGH MARINE RESEARCH AND MONITORING

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Abstract
In our Ocean Literacy activities, we applied two modern research systems, CSI-POM and its second stage, CSI-POM2, to involve, first teachers and then youth in educational activities. In this presentation we focus on a CSI-POM2 system. The CSI-POM2 system was designed to monitor and forecast the state of the southern Baltic environment and its changing environmental conditions, thereby providing a modern tool for effective environmental management in the Polish maritime economy and as well as for protecting people and the environment. Therefore, the primary purpose of the system is to provide scientific information and support decision making, while we used its features for educational activities. In late fall 2024, we had run two day-long, in-person workshops entitled: Using CSI-POM2 tools in modern ocean education. Both workshops gathered a total of 24 participants representing 18 various educational institutions, both formal and non-formal. Then, in late spring 2025, we run a webinar for school teachers, which gathered over 25 participants from different institutions. During these events, we discussed the opportunities and challenges facing the education in the context of using innovative tools such as those developed within the project. According to the SWOT analysis, based on the outcomes of the events, ease of use, free access, and interactive data presentations are the strengths of CSI-POM tools. Thus, they can very well support activities dedicated to increase of ecological awareness and in ocean educational activities. Therefore, we prepared educational packages, which we have been successfully using in educational activities since the beginning of 2026, with a total of over 90 educators who were introduced to the educational package of the system. During the presentation, we briefly show the system features and examples of lesson plans based on the system tools.

Keywords: *Ocean Literacy, environmental education, public engagement, oceanographic data, environmental monitoring.*

BALANCING TEACHING AND RESEARCH: INTEGRATION OF SCIENTIFIC PROJECT OUTCOMES INTO UNIVERSITY CURRICULA

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Abstract
Balancing teaching and research is a growing challenge in engineering education, particularly in the context of rapid technological development and the increasing importance of applied skills. This paper examines how research activities conducted by university teachers can be effectively integrated into undergraduate teaching without compromising curriculum structure. The study adopts a qualitative approach based on the analysis of teaching practices, student outputs, and informal feedback within electrical engineering programs. The findings indicate that the most effective forms of student engagement are those embedded within existing course structures, particularly seminar assignments, final-year projects, and field-based learning activities. These approaches enable students to work on real-world problems while developing practical and interdisciplinary competencies. The results also highlight mutual benefits: students gain improved employability and exposure to modern technologies, while teachers enhance the relevance of their teaching and extend student work into research outputs. The insights obtained in this study provide a basis for the systematic integration of research and teaching in future curricula and will be further applied within the ongoing ELENDRON project, which focuses on AI-supported monitoring of power infrastructure.

Keywords: *Pedagogical innovation, AI in education, student competencies, sustainable technology, Industry 4.0.*

DESIGNING AND DELIVERING EXTRA-CURRICULAR PHYSICAL ACTIVITY PROGRAMS FOR STUDENTS WITH (DIS)ABILITIES: GAME CHANGERS AS A SOCIAL JUSTICE IMPERATIVE

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Abstract
Students with(dis)abilities (SWD) continue to experience inequitable access to extracurricular sport and recreation opportunities within Canadian school communities, despite the well-documented benefits of participation. This paper frames this disparity as a social justice issue and examines the implementation and outcomes of *Game Changers*, a participatory action research (PAR) initiative designed to address the under-servicing of SWD in extracurricular physical activity contexts. Grounded in human-centred design and social justice pedagogies, the program engaged SWD, educators, and community partners in the co-creation of inclusive sport and recreation opportunities across nine Canadian secondary schools. Data were collected through surveys, focus groups, and site observations. Findings indicate that *Game Changers* contributed to increased feelings of belonging, confidence, and enjoyment among participants, while also fostering more inclusive school environments. Structural barriers were reduced through targeted funding and program design, while interpersonal and intrapersonal barriers were addressed through relationship-building and supportive social contexts. Teachers reported increased awareness of inclusive practices, and students emphasized the importance of fun, social interaction, and choice in motivating participation. Despite these positive outcomes, challenges related to sustainability, resources, and systemic constraints remain. Overall, *Game Changers* demonstrates the potential of collaborative, student-centered approaches to disrupt ableist practices and advance more equitable access to extracurricular physical activity, positioning inclusion as a fundamental component of educational practice rather than an optional addition.

Keywords: *Inclusion, physical activity, action research, social justice, students with disabilities.*

CO-CREATING LEARNING SPACES: STUDENT AGENCY AND COLLABORATION IN THE METAVERSE

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Abstract
The objective of our study was to examine whether metaverse-based learning environments, when co-created by students, can enhance collaborative learning experiences in higher education. Specifically, the research investigated how co-creation influences engagement, social interaction, and collaborative effectiveness in virtual learning spaces. The study was implemented using the FrameVR platform across multiple higher education programmes. Twenty students used the platform to support group assignments and peer mentoring activities and eight of them were actively involved in co-creating their virtual environments. A mixed-methods research design was employed to evaluate the intervention. Qualitative data were analysed using thematic coding, while survey data were examined for usage and engagement patterns. Behavioural mapping of recorded sessions was used to analyse movement, interaction density, and patterns of collaboration. The results indicate that metaverse-based collaboration supported higher levels of engagement and interaction compared to typical videoconferencing practices. Embodied movement, persistent avatars, and interactive tools such as shared whiteboards and screens sustained participation. Co-creation practices were associated with increased student ownership, psychological safety, and willingness to contribute. The findings suggest that integrating co-creation into immersive learning design can enhance collaborative effectiveness and student wellbeing. The paper concludes with practical implications for educators and designers and identifies the need for longitudinal and cross-institutional research to assess sustainability and transferability.

Keywords: *Metaverse-based learning, student co-creation, collaborative learning, immersive learning environments, higher education.*

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DRIVERS AND BARRIERS TO GENERATIVE AI ADOPTION AMONG STUDENTS OF INITIAL TEACHER EDUCATION PROGRAMMES

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Abstract
Motivation for the paper: This paper examines one of the most prolific transformations in the education context in modern times from the student perspective – that of the rapid evolution and pedagogical impact of Generative Artificial Intelligence (GenAI). This technology can be viewed both as a source of inspiration and contention. The realisation of GenAI's transformative benefits in terms of teaching, learning, and assessment needs to be appropriately scaffolded so as to ensure that students adopt GenAI in an ethically responsible manner cognizant of the importance of maintaining academic integrity. However, in most studies to date, the student voice in relation to GenAI adoption is largely unheard. *Objectives:* This paper examines the drivers and barriers to the behavioral intention to adopt GenAI among students of initial teacher education programmes in Ireland. This particular context is an interesting one as students play a dual role – as students themselves within their academic programmes and as student teachers within an external school environment. *What was done? How it was done and validated?:* A quantitative online survey instrument was developed to examine GenAI adoption drivers and barriers, with survey constructs informed by a systematic review of literature focused on AI adoption in higher education. This instrument was pilot tested, refined, and subsequently administered to a purposive stratified sample of 600 students enrolled in initial teacher education programmes in Ireland. Data collection resulted in 290 usable responses, achieving a 48% response rate. Analysis of the survey data was performed using both SPSS and N-Vivo. *Results and conclusions:* The study's findings offer illuminating insights into GenAI adoption drivers and barriers among students of initial teacher education in Ireland. The insights gleaned inform a number of recommendations regarding the need to extend existing technology adoption models to better account for the nuances of GenAI adoption and regarding the structures and supports that need to be embedded within educational institutions to foster more effective student engagement with GenAI.

Keywords: *Generative AI, GenAI adoption, drivers, barriers, higher education.*

EXAMINING THE COGNITIVE LOAD OF PRESERVICE SCIENCE TEACHERS IN A BLENDED LEARNING ENVIRONMENT

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Abstract
Instructional delivery can significantly affect students' cognitive load. In a blended learning environment, cognitive load may increase, acting as a barrier to effective learning. Underpinned by the Cognitive Load Theory and the Schema Theory, this study aims to examine the cognitive load experienced by preservice teachers in a blended learning environment. All second-year natural science preservice teachers were invited, but only 40 consented. Data were gathered from participants' submitted reflections. The discussion board activities spanned seven weeks and were conducted in three cycles. After each cycle, participants were required to submit their reflections via the LMS, and these were collected. The data were subjected to inductive coding and subsequently to deductive content analysis, using the 10-item questionnaire developed by Leppink et al. (2013, p. 1070) to measure IL, EL, and GL. Some themes that emerged in the study include symptoms of cognitive load, sources of cognitive load, and cognitive load management strategies. The findings indicate that students' extraneous load is high during the first cycle of the discussion board activity. Factors such as the timing of discussion activities, information overload, intellectual insecurity, and an inferiority complex increase extraneous cognitive load. The collaboration and asynchronous discussion mode improve germane cognitive load, thereby enhancing learning. The study's implications are that students' understanding can be enhanced through peer support, which can reduce their cognitive load and help them acquire the technological skills necessary for teaching.

Keywords: *Asynchronous discussion board, blended learning, Cognitive Load, preservice teachers, student engagement.*

EMPOWERING THE FUTURE: CO-CREATING CLIMATE EDUCATION WITH CHILDREN IN MOZAMBIQUE

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Abstract
This participatory research project centers children's voices in climate education in Mozambique, a country facing significant climate vulnerability alongside substantial gaps in environmental education policy. The study involved six primary schools across three provinces (Maputo, Tete, and Nampula) and engaged children aged 6-12 years, teachers, and policymakers in a co-creation process that challenges traditional approaches to environmental education. Our five-stage methodology moved from preparation through data production, analysis, and action to dissemination. Children explored their environments through photovoice, documenting what made them happy or sad about their surroundings. They articulated sophisticated understandings of local ecosystems, climate impacts, and environmental challenges, demonstrating practical knowledge often overlooked in conventional curricula. For example, in Nampula, children experienced Tropical Cyclone Jude and documented it in their drawings during the research, providing powerful firsthand perspectives on climate impacts. The project fundamentally reframes children from "doubly ignorant" recipients of knowledge (because children and because from the Global South) to competent knowledge producers whose lived experiences offer crucial insights for climate education. Children generated critical questions spanning environmental science, colonial history, and sustainable practices. They then led the creation of radio programs, stories, and music to communicate their findings, producing content that reached wider audiences through community radio networks. Key findings reveal that effective climate education must start from children's existing knowledge, feelings, and actions rather than imposing abstract concepts. The research demonstrates how co-creation approaches build knowledge iteratively through interactions between humans and their environments, contrasting sharply with traditional specialist-driven models. This work offers a methodological approach for reimagining climate education through genuine participation, suggesting pathways toward more just and sustainable futures in contexts where policy gaps leave students vulnerable to climate crises they already experience daily.

Keywords: *Climate education, participatory research, children, Mozambique, co-creation.*

#TRUSTINTRUTH: MEDIA COMPETENCE OF INVISIBLE YOUTH

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Abstract
Social media platforms such as TikTok, Instagram, and YouTube dominate information acquisition for young adults and adolescents, serving as both world-view generators (Rath, 2000) and socialization agents. More than 1 billion hours of YouTube content are consumed daily worldwide, and social media use has become a pervasive feature of everyday life for billions of users (UNESCO, 2021; Lysenstoen et al., 2021). This “always-on” culture intertwines media use with political socialization and amplifies the risks posed by disinformation, fake news, and extremist narratives, including right-wing populism (Bruns, Gläsel & Strobel, 2017; Krange et al., 2021; Tsagkroni, 2022; Berninger & Reichelt, 2022). At the same time, the ability to critically assess media content, navigate contradictory information, and identify misleading or manipulative narratives has become a key democratic competence. The research project #TrustinTruth, funded by the Federal Agency for Civic Education (*Bundeszentrale für politische Bildung*, bpb) addresses this challenge by focusing explicitly on youth whose perspectives often remain underrepresented in large-scale studies on media use and political orientation. Major studies such as JIM (Feierabend et al., 2024) or the Shell Youth Study (Albert et al., 2024) provide important general insights, yet they largely overlook marginalized youth from socio-economically disadvantaged backgrounds or with special educational needs. This creates a significant research gap regarding their media competence, understood here as the ability to “read” media, process conflicting information, detect fake news, and develop political judgment in relation to peers, parents, teachers, and digital media environments. The paper presents findings from an exploratory pilot study that formed the preparatory empirical phase of #TrustinTruth. This pilot was designed as a first systematic test run for the main project in order to gain an initial orientation regarding

relevant themes, patterns of media-related judgment, and possible competence profiles among 11- to 15-year-olds at what has been described as a media-biographical turning point (Feierabend et al., 2024). Using the innovative "Picturizing Strategy"—a visual, low-threshold interview method grounded in Bronfenbrenner's ecosystemic model and concept mapping (Tkotzyk et al., 2024)—we conducted 20 baseline interviews (n=20) in inclusive educational settings. Although the pilot primarily served to prepare the main study, it already generated substantial findings that reveal noteworthy patterns in how these often "invisible" youth groups orient themselves within complex media environments. By making visible the perspectives of adolescents who are frequently overlooked in large-scale media studies, the study contributes to current debates on inclusive media education and political learning and offers impulses for educational practice in line with the UN Conventions on the Rights of the Child and of Persons with Disabilities (UNESCO, 2021; Goll, 2022; Oberle, 2017).

Keywords: *Media competence, marginalized youth, fake news, media education, political judgment.*

"BRAIN KNOWLEDGE FOR LEARNING" PROGRAM: DESIGN AND SHORT-TERM ASSESSMENT

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Abstract
Improvement of study habits in high school would prove beneficial for students at both present and future stages. This could be achieved through programs designed specifically for adolescents, which consider their greater impulsiveness, susceptibility to influence, and vulnerability to risky behaviors. The objective of the current work was to create and evaluate the effectiveness of the Brain Knowledge for Learning (BK4L) program, aimed at adolescents and focused on improving their study habits and decision-making through an understanding of the neural mechanisms involved. The BK4L-Program is based on neuroscience and designed as a voluntary out-of-class activity organized in four sessions (1h 30min each) plus a reinforcement session. The Wooclap platform was used for interactive activities. To assess the effectiveness of the program, a specific instrument (the BK4L-Questionnaire) was developed as a 5-point Likert scale (25 items), which was based on previously validated questionnaires for adolescents and adapted to the contents of the program. It was validated by 4 education experts. In addition, satisfaction with the program and knowledge acquisition were assessed. For implementation of the BK4L-Program, 104 students (15-17 years old) were recruited from two high schools and randomly assigned to control (46) or experimental (58) groups. Data from pre- and post-intervention measures were analyzed using descriptive and inferential statistics to examine changes over time. The BK4L-Program addressed topics related to neuroplasticity, attention and motivation, the reward system and addictions, study organization and planning, concept association and deep analysis, and brain health in adolescence. The validated BK4L-Questionnaire assessed three dimensions: (1) perception of study habits, including attention, motivation, and planning and deep learning; (2) perception of decision making, impulsivity, and emotional regulation; and (3) perception of brain-healthy habits. After the first stage of the program (4 sessions), the experimental group reported improvements across the three dimensions, particularly in attention and planning and deep learning indicators. Satisfaction with the program was high (4.4 ± 0.11 out of 5). The average knowledge acquisition score was 8.91 out of 10 (72.4% excellent and 20.7% very good). Overall, these findings suggest that, unlike previous interventions targeting isolated components, the BK4L-Program provides a well-accepted and effective integrative approach grounded in the mechanistic understanding of learning and decision-making, with its strongest short-term impact on students' perceived study habits and additional benefits for decision-making and brain-healthy habits.

Keywords: *Learning, neuroscience, adolescence, decision-making, Wooclap.*

AN EDUCATIONAL MODEL FOCUSED ON COMPREHENSIVE UNIVERSITY EDUCATION: EXPERIENCES IN ITS IMPLEMENTATION

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Abstract
The U50 Educational Model is an institutional framework that expresses the essence, educational style, and activities of UPAEP University. It is defined as a specific approach to planning, developing, and evaluating a particular educational proposal that seeks the holistic development of students so that they, as graduates, can impact social transformation. This educational model has three constituent dimensions: identity, pedagogy, and formative. Its formative dimension fosters the creation of meaningful learning experiences through teaching methodologies based on active learning approaches such as case studies, problem-based learning, challenge-based learning, inquiry-based learning, and simulation-based learning, among others. Through these methodologies, students critically examine key social challenges from the perspective of their disciplinary training. Simultaneously, they develop generic skills, including social commitment, creative thinking, research, reflective thinking, and collaborative work. The purpose of this research project was to evaluate the level of use of teaching methodologies and assessment tools most frequently employed by teachers. The research methodology consisted of an exploratory survey of teachers´ perceptions, followed by a basic statistical frequency analysis, and finally, a qualitative interpretation of the collected information. The findings reported in the research demonstrate a high frequency of use of the teaching methodologies suggested in the institutional educational model, with challenge-based learning, problem-based learning, and teamwork being among the most frequently used. It is worth mentioning that the teaching methodology employed by the professors is aligned with both the academic program profile and the specific subject they teach. Finally, regarding the learning assessment process, the results highlight the use of rubrics as assessment tools. With the aim of comprehensively evaluating student development, this research project considered the results of an institutional evaluation of co-curricular activities conducted in the areas of professional internships, internationalization, entrepreneurship, and leadership training. The evaluation mechanisms for these activities employ assessment matrices to identify the learning outcomes achieved by students in the development of soft skills.

Keywords: *Comprehensive training, active methodologies, co-curricular learning outcomes.*

TALKING IT OUT: USING INTERACTIVE ORAL ASSESSMENT TO AUTHENTICATE LEARNING IN AN AGE OF GEN AI

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Abstract
Generative Artificial Intelligence (GenAI) has intensified concerns regarding academic integrity and the validity of traditional higher education assessment. This paper presents two case studies examining interactive oral assessment approaches designed to strengthen assessment authenticity in AI-rich environments. The first explores a face-to-face group presentation incorporating spontaneous questioning and collaborative reasoning among undergraduate students. The second examines a fully online Individual Interactive Oral Assessment (IOA) involving adaptive one-to-one dialogue with postgraduate learners. Drawing on theories of authentic assessment, formative assessment, service quality, and learning-oriented assessment, the paper argues that dialogic assessment formats provide a sustainable alternative to surveillance-based responses to GenAI. Findings indicate that assessment designs centred on interaction, contextualised reasoning, and live explanation reduce opportunities for AI-assisted substitution while enhancing student engagement and confidence. The paper concludes that authentic oral assessment can preserve validity, integrity, and educational value in contemporary higher education.

Keywords: *Interactive oral assessment, Generative Artificial Intelligence, authentic assessment, academic integrity, higher education.*

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BEYOND TECHNICAL PROFICIENCY: CONCEPTUALISING INTERCULTURAL PROJECT-BASED LEARNING THROUGH THE GIPE AND GIPE++ INITIATIVES

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Abstract
In response to the growing limitations of traditional internationalisation in higher education, this paper proposes Intercultural Project-Based Learning (IPBL) as a transformative pedagogical framework that enables meaningful intercultural engagement beyond short-term mobility and passive cultural exposure. While international initiatives have expanded globally, many educational models still fail to provide students with sustainability-related contexts, where environmental problems are inseparable from cultural practices, community structures, and socioeconomic realities. Drawing on a longitudinal, practice-based analysis of the Global Intercultural Project Experience (GIPE) and its evolution into GIPE++ between 2020 and 2026, this study examines how blended mobility models and real client projects can foster deeper intercultural learning. Particular focus is given to the GIPE++ 2025 project on Untung Jawa Island, Indonesia, where students and experts from Germany, Indonesia, Namibia, and Peru collaborated in interdisciplinary streams to develop digital platforms, tourism development strategies, innovative promotional approaches, and baseline environmental reports for a local tourism organisation. The study highlights how intercultural communication competence, defined through tolerance, dialogue, cooperation, and international perspectives, becomes a critical condition for effective IPBL implementation. Furthermore, this paper introduces the concept of productive intercultural friction, emphasising that differences in cultural expectations, communication styles, and decision-making practices can serve as catalysts for creativity, adaptability, and transformative learning when appropriately facilitated. Ultimately, the findings suggest that intercultural competence is most effectively developed through co-creation under real-world constraints, positioning IPBL as a scalable and impactful approach to rethinking internationalisation and sustainability education in higher education.

Keywords: *Intercultural project-based learning, collaborative online international learning, intercultural communication competence, interdisciplinary collaboration, international education.*

MOBILE, MEANINGFUL AND INCLUSIVE: RETHINKING ONLINE COURSE DESIGN FOR DIVERSE STUDENT POPULATIONS

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Abstract
As institutions serving increasingly diverse student populations expand their online offerings, course design must move beyond general best practices to intentionally address the needs of underrepresented students. Metropolitan State University of Denver (MSU Denver), a federally designated Hispanic-Serving Institution, enrols a student population that is 56.9% students of color and 53.2% first-generation college students. These demographics underscore the urgent need for inclusive, equity-focused online course design that supports persistence, confidence, and academic success. This paper presents an integrative framework for online course development grounded in the authors' extensive teaching experience at MSU Denver. Drawing from institutional context and applied instructional practice, the authors identify key design and instructional strategies that enhance access, engagement, and retention among ethnically and economically diverse learners. These strategies include: (a) optimizing courses for mobile and handheld device access; (b) providing clear, structured timelines and intuitive course organization; (c) emphasizing conceptual, application-based assessments over rote memorization; (d) embedding a course-specific online orientation; (e) fostering consistent and meaningful student–instructor interaction; (f) incorporating reflective blogging to personalize learning; and (g) limiting mandatory group projects that may create barriers related to time, work obligations, or social anxiety. Mobile optimization supports students who rely primarily on smartphones or tablets due to financial constraints. Clear timelines and structured organization help mitigate challenges associated with self-regulation, which may disproportionately affect first-generation and underprepared students. Course-specific orientations increase technological confidence by allowing

students to practice essential tasks such as discussion participation, quiz completion, video engagement, and assignment submission within a low-stakes environment. Shifting assessments from memorization to conceptual understanding reduces inequities associated with prior academic privilege while promoting deeper learning. Finally, consistent instructor presence and opportunities for reflective engagement foster belonging, connection, and academic integration. Collectively, these practices represent an integrative, equity-driven approach to online course design. By intentionally aligning pedagogy, technology, and assessment with the lived realities of underrepresented students, faculty can enhance retention, academic confidence, and overall student success in online learning environments.

Keywords: *Online course design, equity-focus pedagogy, student retention.*

THE USE OF MOBILE CLICKER TECHNOLOGY IN FOUNDATIONAL ORGANIC CHEMISTRY FOR ENHANCED STUDENT ENGAGEMENT

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Abstract
Foundational Organic Chemistry is typically taught in the final quarter of the second semester, a period when students often experience reduced concentration and energy levels. Engaging students in this context remains a persistent challenge, particularly given the abstract nature of the content and the high cognitive demands associated with the subject. This study explores the integration of mobile clicker technology as a pedagogical strategy to foster an interactive, inclusive, and responsive learning environment in large classroom setting at a traditional contact university in Pretoria, South Africa. The intervention involved the strategic incorporation of five to six clicker questions within the lecture to stimulate critical thinking, identify learning gaps, and promote collaborative engagement. By using their personal mobile devices, students engage in real-time learning through immediate feedback and lecturer-facilitated discussions aimed at addressing misconceptions. A mixed-method approach was adopted. Quantitative data were obtained from student performance on subtopic-specific questions embedded within lectures, as well as from a comprehensive integrative quiz administered at the conclusion of the topic. Qualitative data were drawn from students' feedback collected through end-of-course teaching evaluations. A pre-test and post-test were also conducted to measure knowledge gained. The findings of this study show that the use of mobile clickers enhanced student engagement, as evidenced by higher participation rates and continued attention during lectures. Students reported improved confidence in navigating complex concepts and valued the immediate feedback. Additionally, the technology fostered a more inclusive learning environment by enabling anonymous participation, thereby supporting contributions from less vocal students. Furthermore, performance on the integrative quiz suggests improved consolidation of knowledge across subtopics. Overall, although mobile clickers have their limitation, the study highlights their value as an effective pedagogical tool in transforming passive learning environments into active, student-centred spaces and recommends their integration in science education.

Keywords: *Mobile clickers, foundational organic chemistry, pedagogical strategy, student engagement, active learning.*

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HOW DOES MUSIC INFLUENCE ENGAGEMENT AND RETENTION IN THE CLASSROOM?

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Abstract
This study explores the role of music as an innovative pedagogical tool and its impact on student engagement and retention in contemporary educational settings. In response to increasing learner disengagement and the growing dominance of digital technologies, music emerges as a powerful human-centered approach that reactivates attention, motivation, and emotional connection within the classroom. Using a descriptive-analytical methodology, this research examines the cognitive, emotional, and social dimensions of integrating music into teaching practices. Findings indicate that music enhances memory retention by anchoring information in rhythmic and melodic structures, facilitating long-term recall beyond traditional rote learning methods. Furthermore, music stimulates brain activity, improves attention regulation, and fosters a positive learning environment, all of which contribute to higher levels of student engagement. The study also highlights the role of music in breaking the rigidity of conventional teaching methods by introducing creativity, interaction, and interdisciplinary learning frameworks. Practical strategies are discussed, including transforming lesson content into educational songs, using rhythm to reinforce linguistic patterns, and incorporating short musical interventions to improve focus and classroom atmosphere. In addition, the research considers the emerging role of artificial intelligence in supporting music-based pedagogy, enabling educators with limited musical backgrounds to design and implement effective educational songs. Ultimately, this paper argues that music is not merely a supplementary tool, but a transformative element in education that enhances engagement, strengthens retention, and restores the human dimension of learning in an increasingly mechanized educational landscape.

Keywords: *Music in education, innovative pedagogy, educational songs, student engagement.*

TEACHING AND LEARNING

IMPLEMENTING SMART GOAL-DRIVEN, INTEGRATED HEALTH IMPROVEMENT PROJECTS IN COLLEGE STUDENTS

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Abstract
College students face a unique set of health challenges, including increased stress, poor dietary habits, sedentary lifestyles, and limited access to mental health resources. Given that health and wellness consist of multiple dynamic dimensions, multifaceted interventions aimed at enhancing the physical and mental well-being of students are necessary. Research has indicated that integrated approaches combining physical activity, mental health education, and accessible support services are essential for fostering long-term wellness among college students. Implementing evidence-based programs that promote resilience, academic success, and holistic health can have a profound impact. On the personal level, college students can improve their health by making small, consistent changes across several areas of their lives. Our freshman-level Personal Health & Wellness course (HED 132) gives them an opportunity to choose a specific thing they wish to improve over the course of the semester and apply what they have learned in the classroom to develop a detailed plan of action. The project is described as follows: Set a realistic but challenging goal that you feel you could reach by the end of the semester (make sure it's S.M.A.R.T.); Using at least three professional references (your text doesn't count), construct a 2-3 page rationale for your project (why are you doing this?). Explain the benefits to be gained and the scientific principles related to the improvement of your health status; Write a specific plan of action you will follow to meet your goal with enough detail so that anyone could do it; Record your progress in a journal (weekly entries; at least 10 total); and Write a final evaluation of your project based on your journal entries. Components are collected throughout the semester: behavior/attitude and goal, rationale with 3 sources cited, plan of action, journal entries, and final evaluation. The purpose of this paper is to describe how we help students apply what they have learned to a systematic plan for improving their health and to share student feedback regarding the project. We believe this approach is applicable to any personal health and wellness course.

Keywords: *Personal health, wellness, behavior change.*

INFORMAL LEARNING ENVIRONMENTS IN THE DEVELOPMENT OF ADOLESCENTS' ENTREPRENEURSHIP COMPETENCE

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Abstract
This study examines the role of informal learning environments in the development of entrepreneurship competence among adolescents. Drawing on a large-scale survey of 15-year-old learners in Finland (N = 26,063), it analyses how hobby engagement, discussions with family and peers, and school-based discussions are associated with entrepreneurial knowledge, skills, and perceptions. The findings show that informal learning contexts play a differentiated role: hobby engagement is most strongly related to entrepreneurial skills and personality-related features, whilst home and peer discussions are key predictors of positive entrepreneurial perceptions. In contrast, school-based discussions contribute to knowledge and skills but are not associated with more positive perceptions of entrepreneurship. Overall, the results highlight that entrepreneurship competence develops beyond formal schooling and underscore the importance of better connecting entrepreneurship education with adolescents' everyday learning environments.

Keywords: *Entrepreneurship education, entrepreneurship competence, informal learning environment, survey, adolescent.*

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RECLAIMING LANGUAGE, REIMAGINING TEACHING: A PATHWAY FOR HERITAGE SPANISH SPEAKERS

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Abstract
Due to recent legislation expanding the educational opportunities available to emergent bilinguals in California, the need for both bilingual K-12 programs and qualified teachers to staff them has increased significantly. In fact, many studies have documented this critical teacher shortage both at the state and national level. As a direct response to this problem, we report on an undergraduate program launched in 2020 aimed at preparing students who are interested in becoming bilingual teachers. What is unique about this program is that it was specifically designed for Spanish heritage speakers, that is, those who grew up exposed to the minority language in the home. According to the latest census data, over one-fifth of the US population speak a language other than English at home. In California, this proportion is much higher at over 43 %, with 28% of speakers reporting Spanish as their heritage language (HL). Nevertheless, research reveals that proficiency in the HL decreases rapidly in the second generation, leading to a decline in their use over time. This four-course program focuses on opportunities for heritage Spanish students to further develop Spanish language skills, learn about education policy analysis and policies impacting bilingual communities, engage in internships in bilingual classrooms, and acquire knowledge about Latin American history. We situate the program as a language nest or *nido* that reclaims students' aspirational, familial, linguistic, social, navigational and resistance capital. We propose the program as a model for both advancing educational equity in linguistically diverse communities and leveraging heritage speakers' assets. We discuss some of the challenges of implementing this curricular model at the institutional level and recommendations for moving forward. Given the increasing teacher shortages and decline in enrollment in teacher education programs, this work contributes to the knowledge of how to leverage the bilingual and bicultural backgrounds of undergraduate students who are considering a career in education.

Keywords: *Heritage speakers, bilingual education, community cultural wealth, teacher preparation, Spanish.*

THE ARTIFICIAL INTELLIGENCE IMPACT ON STUDENTS' COMPETENCIES AND CRITICAL THINKING IN HIGHER EDUCATION

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Abstract
The rapid advancement of artificial intelligence (AI) is reshaping societal structures, yet higher education faces the challenge of integrating AI in ways that foster critical thinking and competence development. While students increasingly use AI tools to ease cognitive and workload demands, overreliance risks undermining independent analytical skills. Educational institutions must ensure that learning outcomes align with competent frameworks, emphasizing human-centered reasoning over AI-generated content. The EU Artificial Intelligence Act reinforces this responsibility by promoting ethical and responsible use of AI in education. First, this article provides an overview of studies conducted with students on the impact of AI use on learning programming. Second, it presents research on how lecturers in programming courses at universities of applied sciences introduce AI guidelines, encourage meaningful learning beyond mere reliance on AI, and foster critical thinking. Findings highlight the pivotal role of educators in designing strategies to support and assess student competencies within AI-enhanced learning environments.

Keywords: *Generative AI, critical thinking, development of competence, higher education studies.*

LINGUISTIC CHALLENGES IN SCIENCE FOR STUDENTS WITH SPECIFIC LEARNING DISORDERS IN READING AND WRITING

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Abstract
Specific learning disorders in reading and writing (SLD-IRW) characterized by significant deficits in these areas of functioning. As science performance heavily relies on literacy skills, students with SLD-IRW may experience more substantial difficulties in science performance than their peers without such disorders. In fact, research indicates that students with SLD-IRW often struggle more with processing certain linguistic features and producing written texts compared to students without SLD-IRW. However, less is known about how these challenges appear in assessments of science performance. This study aimed to investigate whether specific linguistic features of test items—particularly those requiring receptive skills—and the use of open answer formats, which demand productive skills, impact the science performance of German-speaking students. Additionally, the study examined whether these effects are more pronounced for students with SLD-IRW. The sample consisted of 20,344 ninth-grade students from Germany (48.5% female; age M = 15.59 years). We estimated extensions of the two-parameter logistic item response theory model that included effects of linguistic item features and their interactions with individual-level variables. Results indicated that students with SLD-IRW scored significantly lower on science test items than their peers. Notably, items that required productive skills (such as open-ended responses) had a stronger negative impact on students with SLD-IRW. In contrast, interactions effects between receptive linguistic features—like sentence length and word count—and students' SLD-IRW status were generally insignificant or of minimal effect. Theoretical implications include that test fairness for students with SLD-IRW can be maintained if science assessments are designed appropriately. Future research should aim to confirm our findings. Practically, educators should carefully consider the goal of each test item—whether it aims to assess factual knowledge, conceptual understanding, or critical thinking—to determine the appropriate response format. It is also important to recognize that high linguistic demands may hinder students with limited literacy skills, such as those with SLD-IRW, from effectively demonstrating their scientific knowledge, as linguistic challenges can impede their ability to perform well on assessments.

Keywords: *Specific learning disorders, science education, receptive skills, response format, competence testing.*

DESIGN THINKING IN SCIENCE TEACHING - EXPERIENCES FROM TWO APPROACHES TO INTEGRATING A NEW LEARNING CONCEPT

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Abstract
Today's students are growing up in a world where they are confronted with a multitude of information that they must organize and evaluate. In order to find their way around, they need not only basic technical knowledge but also skills such as creativity, critical thinking, communication and collaboration (some of the so-called future skills). In order to prepare students for this world and equip them with these competences, an approach based on design thinking seems promising. This approach has gained considerable attention in the implementation of innovations in companies worldwide and has already found its way into schools as a learning method in some cases. Since the future skills also play an important role in the assessment of climate issues, the concept is also suitable for use in schools in the context of Education for Sustainable Development (ESD). Two approaches to integrating design thinking into science teaching

in schools were therefore tested in studies conducted as part of PhD projects. Both approaches took special account on ESD aspects. The first project specifically focused on examining the framework conditions and success factors for use in upper secondary school chemistry lessons. To this end, three modules, each comprising 10 lessons, were developed for grades 11-13 and implemented with two parallel classes over three consecutive years. Using a design-based research approach, the lessons were observed and the students' learning diaries were evaluated. It was proven that the integration of design thinking was successful with regard to some future-oriented competences. In particular, students' creativity and evaluation skills increased, and the suitability of the framework conditions was demonstrated. In the second project, building on the experience gained, a broader, interdisciplinary approach was chosen. For this, another design thinking approach was implemented at a school over a period of three years. This approach was expanded to include the aspect of service learning within a project-based format to create a positive effect on society. Groups of 12th grade students were given one school year each to independently develop sustainable projects. In a qualitative research design approach based on the CIPP model (Context, Input, Product and Process), students and teachers were interviewed in detail about their expectations and experiences before and after every round, with the annual results being used to optimize the approach. The findings demonstrate that the project participants achieved learning gains across various competence domains.

Keywords: *Design thinking, service learning, science education, ESD.*

THE IMPORTANCE OF PERSONAL SKILLS AS THE BASIS FOR A SUCCESSFUL DUAL CAREER AT ELITE SPORTS SCHOOLS

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Abstract
Objectives: Early promotion of self-regulation skills is crucial for the successful career development of young talents at an elite sports school, as these skills are fundamentally developed in childhood. It can be assumed that the ability to perceive high stress levels as anything other than a negative burden depends on how well self- competence skills are developed. As the intensity and extent of stress in competitive sports cannot be altered at will, but rather depends on the demands of the sport in question, tolerance of stress must be trained. Previous studies have shown that top athletes in particular are able to perceive high levels of stress as a positive challenge, whereas athletes of the same age and talent perceive the same conditions as stressful (Schröder, 2025). These results should provide insights into how young athletes can be coached more effectively to prepare them for new stress challenges. *Methods:* A total of 58 pupils, aged between 10 and 13 years old (mean age = 11.67 years; SD = 1.44 years), were surveyed about their self-competence using the SSI-K3 (Kuhl & Fuhrmann, 2004) at three different time points. The pupils were surveyed before, immediately after, and one year after entering an elite sports school, in order to link any changes in skills to different phases of their school career. As it was not feasible to survey all pupils at each time point during the period under consideration, the present study is divided into three distinct segments. Firstly, a cross-sectional study at t3 is conducted. Secondly, a two-paired group comparison is made from t1 to t2 and t2 to t3. Thirdly, a longitudinal comparison was conducted from t1 to t3. *Results:* The SSI-K3 demonstrates good validity (α = .795), thus confirming the results previously reported by Kuhl and Fuhrmann (2004, α = .73–.90). The first analysis of the cross-sectional results at t3 already showed that a noticeable but not significant decrease in self-efficacy could be observed at t2, whereas at the same time the threat items increased (p =.069, partial η^2 = .041). The subsequent longitudinal studies at two time also demonstrated these trends, with a significant change observed for threat from t2 to t3 (p = .019, d = .621). The longitudinal study demonstrated analogous trends; however, these were not statistically significant (p = .089, partial η^2 = .080). *Conclusion:* The results show that changes in sport-school conditions influence self-competence. Since career paths vary (Stambulova & Harwood, 2022), they can be adapted individually to reduce stress and increase self- efficacy. For example, giving athletes more say could significantly reduce the negative effects of stress. As stress is a significant factor in premature dropout, reducing it could lead to more successful careers in the dual career system at an elite sports school.

Keywords: *Dual career, stress, competitive sport, young athletes, self-competencies.*

PARENTING AND GLOBAL SOCIOLINGUISTIC DISCOURSES: EXAMINING THE INTERSECTION OF LANGUAGE POLICY, PARENTAL CONCERNS, AND THE CONCERTED CULTIVATION OF MULTILINGUALISM

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Abstract
Shifts toward an interconnected global economy have raised concerns among middle- and upper middle-class parents about the role of multilingualism and multiculturalism in child rearing. Affluent parents have been previously recognized as "cultivating" childhood experiences to promote competitiveness in the professional sphere (Lareau, 2003). The cultivation of multiple languages and a multicultural stance has, as the global economy has broadened, become part of "good parenting" for many families. This logic, based on economic ideas in support of the free market and the unrestricted flow of capitalism, has influenced how society has been corporatized and how individual subjects are considered within an ever-growing and always competing global economy. Against this background, this qualitative study uses a language policy theory (Spolsky, 2004) to examine beliefs, practices, and behaviors of parents of children enrolled in an early childhood program at a private international school in Hong Kong (ISHK). The findings show how the focal parents created and enacted their own language policy based on their beliefs about languages, the practices they carried out, and their management of their children's linguistic skills to develop a "concerted cultivation" of multilingualism, even during the Covid-19 pandemic. Parents took on the role of the primary enactors of the language policy in both school and home domains, drawing from their language beliefs and employing language practices and language management to achieve distinct linguistic goals. This study highlights current tensions between language ideologies and practices in contemporary schools. It emphasizes the need to understand the neoliberal view of languages as economic assets and contributes to research on language policy and parental engagement by showing how social actors navigate and support language learning, even under dire conditions.

Keywords: *Concerted cultivation; multilingualism; early childhood; parent engagement; language policy.*

HOW PRE-SERVICE STUDENT TEACHERS COLLABORATE IN WORKING WITH A HYBRID MYSTERY GAME CONTAINING MULTIPLE TEXTS: AN OBSERVATIONAL STUDY

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Abstract
Pre-service training institutions have a responsibility to include lessons that enhance student teachers' critical thinking skills in a collaborative setting. In this study, six student teachers worked with a hybrid, commercial mystery game containing multiple texts after having a lesson on multiple-text comprehension. The aim of this qualitative intervention study was to investigate how the student teachers collaborate and interact when working with a commercial mystery game in an educational setting. We used Wineburg's heuristics and the framework Tech-SEDA to investigate video-recorded problem-solving conversations, focusing especially on how grades are initially proposed, negotiated, and decided through a series of actions that constitute the decision-making process. We investigated what types of conversation strategies were applied during the task, and how student teachers cooperated and reflected after the game-based inquiry task. Further, we examined how the student teachers expressed the transferability to their own practice as future teachers.

Keywords: *Hybrid game, problem solving, multiple texts, collaborative learning.*

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CASE STUDY OF DEVELOPING SUSTAINABILITY KNOWLEDGE IN THE TEXTILE AND FASHION INDUSTRY PILOT TRAINING: SOURCES OF SUSTAINABILITY INFORMATION AND SHIFTS IN INFORMATION-SEEKING BEHAVIOUR

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Abstract
This study presents a case of sustainable development pilot training in the textile and fashion industry, called "JOSPA –What if we could find a new direction for sustainable development in the textile and fashion industry". The training has aimed to support the transition to employment as a craft entrepreneur or in industrial production. Pilot training consisted of eleven courses, from sustainable design and pattern making up to sustainable quality management in the textile industry, e-commerce and content production and intellectual property rights. The aim of this study is to investigate where participants in the textile and fashion industry pilot training acquire sustainability-related knowledge, identify the most frequently used sources, and examine whether their information-seeking practices changed during the training. In this qualitative case study, data were collected via open-ended questionnaires administered to participants through a learning management system. At the beginning of the training, there were 47 participants, 27 (55,3%) of whom responded to the 1st question of the initial survey. Eighteen months later, at the end of the training, 9 (19%) participants responded to the final survey. The initial survey data were collected in August 2023, and the final survey in February 2025. Thematic analysis was conducted to identify recurring topics and themes in responses. The preliminary findings indicate a slight shift toward more systematic sustainability of information–seeking practices following the training. This change highlights the importance of structured education in promoting source reliability and regulatory awareness within the textile and fashion industry. The results have implications for curriculum development and professional training programs.

Keywords: *Sustainability knowledge, sustainability, training program, case study, critical.*

UNDERSTANDINGS, EXPECTATIONS AND EXPERIENCE OF PARENTS IN TERMS OF USING BABY SIGN LANGUAGE AS A MEANS OF SUPPORTING A CHILD'S EARLY COMMUNICATION

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Abstract
Gestures are not only preconditions for a language but also predict a linguistic development and a child's purposeful gesturing can be considered to be the beginning of conscious communication. Several studies have concluded positive effects of baby sign language for toddler's language development and development of communication skills. Using gestures during a child's pre-language period motivates them to acquire and use the language by giving them a linguistic example. Activities based on gestures can be used to develop a toddler's vocabulary and language skills early on. Supporting early on development of communication skills can have a positive effect on the education system by reducing the number of children that may require special education services. The goal of the research is to find out understandings, expectations and experience of parents in terms of using baby sign language to support child`s verbal language development and early on communication. Based on the research objective, the following research questions were established: 1) How are parents understanding baby sign language as a means for the first communication method? 2) What are the expectations of parents for baby sign language courses as a supportive means for developing a child's language? 3) How are parents evaluating the effects of baby sign language on a child's language development? 4) How are parents evaluating the change in child-parent communication during the baby sign language course? For the thesis, a qualitative research method and semi-structured interviews as a research instrument were used. The sample consisted of 10 parents who have participated in at least one baby sign language course. To analyse the collected data, the principles of qualitative content analysis

were used. The analysis of the data showed parents are increasingly considering it important to consciously develop their child. They are getting more competent at finding the appropriate tools for that, considering it important to use the sign system for early communication with the child. Parents are aware of the possible positive effects the baby sign language courses have on the development of a child`s language skills and explain desire to support their child's linguistic development and reduce the possible difficulties of language acquisition in the future. According to the parents, participation in a baby sign language course helps to support the development of a child's oral language by increasing the vocabulary, giving the child a skill of sentence construction and understanding of the grammatical structure of the sentence allowing to use a common communication tool with a parent. The study showed parents who participate in a baby sign language course are paying attention to developing a child's communication skills which allows parents to take into consideration a child's needs and growth in order to better understand a child's thoughts and prevent frustration.

Keywords: *Baby signing, development of verbal and nonverbal communication, development of communication skills, parent-child bonding.*

SCHOOL AS A SPACE BETWEEN CRISIS AND POSSIBILITY: GIRLS' EDUCATIONAL EXPERIENCES IN MID-20TH-CENTURY CROATIA

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Abstract
Contemporary discussions on global crises and polycrises (e.g., European Commission, 2022, 2025; UNESCO, 2023) highlight a wide range of challenges, from the consequences of pandemics and persistent poverty to armed conflict and erosion of democratic rights. These issues are particularly evident in the field of education, where their effects appear in patterns of exclusion, limited access to education, and widening inequalities. For example, today, one in five children, adolescents, or young people worldwide is currently excluded from education, and three-quarters of all primary-school-aged children (around 9 million) who are projected never to attend school are girls (UNESCO, 2025). Although the contemporary context of crisis differs significantly from those of the past in technological, economic, and institutional terms, the fundamental patterns of vulnerability and inequality persist through time. Many risks shaping children's lives today – poverty, wartime conditions, and educational inequalities – have clear historical parallels. Crisis should therefore not be understood merely as a sudden disruption, but as a long-term and deeply embedded pattern of insecurity that shapes childhood experiences, particularly those of girls. Examining retrospective memories of schooling offers an opportunity to understand how such structural crisis conditions were lived, interpreted, and given meaning in everyday life. This study focuses on historical crisis conditions and the role of education within them by exploring how women, in adulthood, reconstruct and interpret their primary school experiences during the Second World War and the immediate post-war period. Particular attention is given to how schooling was experienced within contexts marked by war-related trauma, poverty, intensive physical labour, traditional gender expectations, and limited parental support. Growing up as a girl in this period provides insight into everyday childhood shaped by scarcity and instability. Within such circumstances, school emerges as an ambivalent yet profoundly significant environment. Despite material deprivation and strict disciplinary practices, it could simultaneously offer distance from demanding family environments, opportunities for learning, and moments of safety that opened new horizons and influenced girls' life trajectories. In this sense, school may be understood as a space situated between crisis and possibility. Analysing schooling through this lens allows examination of its dual role. On the one hand, wartime and post-war schools operated within the same structural constraints that shaped family and community life, including poverty, limited resources, and rigid gender norms. On the other, they represented a rare public space in which girls could access time for themselves, cognitive stimulation, and emotional support from teachers, revealing education as both shaped by crisis and capable of generating possibilities beyond it.

Keywords: *Education in crisis, girls' education, protective school environment, transformative schooling, World War II.*

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A DIGITAL MAPPING APPROACH TO LITERARY ANALYSIS: PROMOTING METACOGNITION AMONG GEN-Z STUDENTS

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Abstract
Teaching carries special challenges for the instructor whose audience is composed of the demographic group known as Gen Z. The cohort born between 1997 and 2012 has been characterized as being accustomed to experiencing the world through digital platforms and expecting immediate results (Indelicato 2024). They are also reading less and are described as having shorter attention spans (Rothman 2016; Sliwa 2018). Such tendencies may be especially problematic in the teaching of literary analysis. To deal with these challenges, instructional technology tools may be particularly useful. Certain pedagogical tools have been developed allowing for the creation of shareable interactive maps that complement reading and enhance visualization and immersive experiences. One such application is ArcGIS StoryMaps® which, according to its creators, "informs, inspires and engages stakeholders." This presentation describes the application of ArcGIS StoryMaps® in the course "French Literature before the Revolution: Coming of Age from the Middle Ages through the Revolution." The application was employed to assist the discussion of Voltaire's philosophical tale *Candide, ou de l'Optimisme*. Thanks to its narrative arc and the journey undertaken by its protagonists, *Candide,* lends itself to visual, digital, and cartographic analysis. We hypothesized that a careful reading of the tale, accompanied by collaborative mapping work, might captivate Gen Z students and encourage them to engage in critical thinking about the classroom material. The combination of reading and creation allows students, on the one hand, to better grasp the content of the work and, on the other, encourages them to engage in thoughtful and metacognitive work, as well as self-knowledge through their own personal journey that would follow in the footsteps of the protagonists of the tale. During the module dedicated to *Candide*, the six students enrolled in the course worked in pairs to create digital maps on the ArcGIS StoryMaps® platform. Each map was associated with a different geographical location in the story and appears in chronological order. The result, available online, is an interactive edition of the students' research and reflections. The presentation focuses on the methodology used. In the session, we will view some of the pages developed by the students and examine the advantages and disadvantages of the project. We will also make recommendations for future projects and open the discussion to invite attendees to share their opinions and their own experiences with this (or other similar) platforms.

Keywords: *Digital humanities, digital mapping, French literature.*

UNDERGRADUATE EMPLOYMENT, ACADEMIC PERFORMANCE, AND DEBT ACROSS UNIVERSITIES IN THE AMERICAN NORTHEAST: AN EXPLORATORY STUDY

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Abstract
The increasing costs of education in the United States and the substantial population of employed undergraduate students raise important questions regarding the intersection of employment, student debt, and academic outcomes across institutional contexts. Previous research has largely established a negative relationship between student employment and academic performance; however, the existing body of research pays limited attention to how this relationship varies across institutions and to the mitigating effects of employment on student debt. This study draws from an institutional perspective to examine whether university environment moderates the effects of student employment on academic performance and whether employment impacts students' projected debts upon graduation. Two research questions guide our investigation: (1) Does employment differently affect the academic performance of undergraduate students attending universities with varying levels of selectivity? (2) Do employed undergraduate students project to graduate with less debt than their unemployed counterparts? Employment may shape academic outcomes by constraining students' time, cognitive bandwidth, and engagement with instructional activities, rather than directly impairing learning ability – particularly for low-income students, who prior studies indicate

are more likely to work full-time. This study employed a cross-sectional, quantitative research approach, where students from four schools in the American Northeast – including a community college, state university, and highly selective private university – reported weekly employment hours, academic outcomes, and financial expectations. A regression-based analysis model was applied to determine the strength and significance of the relationships between key variables. The results of this exploratory study suggest that the examined relationship between employment and academic performance may be more contextually nuanced than previous research suggests, as no clear relationship between employment and academic performance was observed at any of the universities studied. However, the employed students in this sample expected 38% less debt at graduation compared to their unemployed counterparts, suggesting student debt may be an educational outcome influenced by extracurricular employment. This study's findings contribute to the scholarship covering learning and inequality in four ways: they demonstrate that the academic consequences of undergraduate employment are institutionally dependent rather than universal, refine assumptions about the academic risks of student employment, extend learning and education research by classifying projected student debt as a meaningful educational outcome, and highlight the importance of institutional conditions in shaping how employment intersects with learning and financial well-being. These insights offer important implications for educators, administrators, and policy makers seeking to more effectively support working undergraduates.

Keywords: *Student employment, student debt, academic performance, institutional selectivity, access to higher education.*

FORCE MEASUREMENT FOR DEMONSTRATION OF NON-LINEAR ASPECTS OF HYDRODYNAMICS FOR ELEMENTARY AND SECONDARY SCHOOL STUDENTS

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Abstract
Hydrodynamics represents an attractive and visually engaging branch of physics that can be effectively used to popularize science among students. At the University of West Bohemia in Pilsen, demonstration experiments have been developed to introduce the fundamental principles of aerodynamics through force measurements in a wind tunnel. These experiments allow students themselves to participate actively in the measurement process. A representative example involves measuring drag forces acting on Lego model. Students control the tunnel velocity and angle of attack, thereby experiencing firsthand the quadratic dependence of drag on velocity. The results show the steep growth of aerodynamic forces with increasing speed, highlighting the energetic demands of high-speed transportation. Further demonstrations emphasize the nonlinear nature of fluid flows. For instance, splitting an obstacle into two blocks does not lead to a simple linear superposition of forces; instead, the measured drag depends strongly on the separation distance. The presented experiments are safe, time-efficient, and suitable for interactive engagement during school visits. They provide children with the opportunity to manipulate experimental parameters, observe real-time data, and even design their own obstacles. Such activities foster curiosity, abstract thinking, and appreciation of the complexity and beauty of the nature.

Keywords: *Drag force, bluff body, wind tunnel, demonstration experiment, excursion.*

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MECHANISMS, PATTERNS, PROCESSES: ASSESSING VISUAL GENERATIVE AI AND HUMAN CREATIVITIES AT ONCE

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Abstract
In early 2025, a legal protection granted by the US Copyright Office to an image composed entirely of AI generated material marked a clear distinction between the human and artificial creativities, positioning the latter as tool to be guided by someone's intent and imagination. Generative visual AI is just a tool then, easy enough to use, yet challenging to master. The seed alone, one of the core parameters common to all image generative systems, is a 32-bit random value allowing users to visualize the same textual prompt into 4 billion possible different ways. Ignoring the calculation time, the simple act of gazing to each single generated image would require approximately 250 years. Combined with limitless stylistic variations and combinations, it is clear how 'inhuman' generative AI is, by utterly surpassing both the physical and cognitive capabilities of even the most skilled and expert group of individuals. Nevertheless, such sophisticated tools have been embedded in the daily practices of professionals, students, and educators. Whereas it seems that this technology will further evolve to match specific disciplinary needs as well as to improve user-machine interactions, we argue that much of the efficiency and the proficiency in using such instruments is to be found in people's hands and minds. Building on Guilford's concept of divergent and convergent thinking, and Goleman's four-stage model of creativity we have investigated such behaviours in a practical case scenario on multiple users, by highlighting significant correlations with the inputs and the responses to and from the software, as well as their interplay with the creators' agency. Based on both quantitative and qualitative data, the subsequent observations of emerging patterns may offer valuable insights in understanding the unfolding connections when the sentient being and the intelligent tool when are operating together, thus contributing to the definition to methodological guidelines in support of the creative work of artists and designers.

Keywords: *Visual generative AI, education experience, open-source AI tool, cognitive psychology.*

CHILDREN'S BODY POSTURE SCREENING PROTOCOL – A NEW DIAGNOSTIC TOOL FOR PAEDIATRICIANS, PHYSIOTHERAPISTS AND PE TEACHERS

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Abstract
Analysis of the general health of children and adolescents indicates an increasing risk of metabolic diseases resulting from excess body weight and lack of physical activity, the widespread occurrence of poor posture, and poor mental well-being. These data confirm the need to promote postural hygiene, which should be considered an essential element of healthcare. Postural hygiene includes maintaining correct body posture in static positions and while moving, the habit of regular physical activity, and a healthy diet that ensures a healthy body weight. Correct body posture not only affects physical health, but also supports mental, emotional and social functioning through better self-esteem, especially body self-esteem. Regular assessment of body posture is particularly important in children and adolescents, because at this age, due to rapid growth, plasticity of the musculoskeletal system and sensitivity to stimuli, the occurrence of body posture defects is particularly frequent. Posture screening for children and adolescents is implemented in every European country, but it does not lead to a reduction in the incidence of musculoskeletal deformities. Social campaigns encouraging healthy habits of physical activity and healthy eating also fail to achieve their intended purpose. It seems that one of the gaps that needs to be improved is communication between healthcare providers, parents, and the school community. To facilitate this communication, we are proposing a simple tool - body posture screening protocol. The goal was to guide a paediatrician or other specialist through a posture assessment in a user-friendly manner: the protocol is only two pages long and requires no manual entry of the diagnosis, but only the appropriate option selection. The assessment using the protocol takes no more than a few minutes and requires no equipment other than a scoliometer. All body segments are assessed in the habitual standing position, viewed from the front, back, and side, as well as trunk rotation in a forward bend. To make the protocol easy for parents to interpret, graphics have been added to help understand which body segments were assessed and how. The parent also receives

information on whether the child's body posture is correct or requires correction or further diagnosis. Such a protocol could be transferred to the school environment, for teachers to introduce appropriately selected elements of corrective gymnastics during PE lessons or in-class activities. The method of conveying knowledge about postural hygiene to school children and how to carry out exercises that shape the habit of correct body posture is being developed, for example, in the project "Spine-Friendly Teacher, Spine-Friendly School" (2025-1-PL01-KA220-SCH-000350791).

Keywords: *Children's health, body posture, faulty body posture prevention, posture hygiene, health care.*

LONGITUDINAL EVIDENCE FOR THE MINIMAL ROLE OF WORKING MEMORY IN ADVANCED L2 ACADEMIC SKILLS DEVELOPMENT

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Abstract
Research in second language acquisition has traditionally emphasized the importance of cognitive resources—particularly phonological short-term memory (PSTM) and working memory capacity (WMC)—as predictors of early L2 development. However, considerably less is known about whether these cognitive factors continue to influence language growth once learners reach advanced proficiency and engage with complex academic skills. This paper synthesizes findings from two longitudinal studies examining the effects of PSTM and WMC on the development of L2 writing and grammar competence in advanced adult learners of English over a two-year period. The aim is to determine whether memory-related cognitive constraints remain predictive of progress at higher proficiency levels. The first study followed 32 Polish university students majoring in English, who completed PSTM and WMC tests alongside three writing assessments administered at six-month intervals. Writing performance was evaluated in four analytic domains: content, organization, vocabulary and language use, and mechanics. Although both PSTM and WMC correlated with writing outcomes at individual time points, repeated-measures analyses showed that neither cognitive factor significantly predicted developmental trajectories. Higher memory scores did not translate into greater writing improvement over time. These results suggest that once learners attain advanced writing abilities, further progress is driven primarily by accumulated practice, metacognitive regulation, and genre familiarity rather than by core memory capacities. The second study involved 107 advanced L2 English majors assessed across four waves of grammar testing. Participants completed two PSTM tasks and two WMC tasks, enabling latent growth modelling of grammar development. Cross-sectional correlations were found between grammar competence and several memory measures, including non-word repetition and both listening and reading spans. However, growth models indicated that only listening span predicted changes in grammar performance, and this effect was small. Overall, the data showed that cognitive memory resources exert limited influence on long-term grammar development at high proficiency. Taken together, both studies provide convergent longitudinal evidence that PSTM and WMC, although related to performance at single time points, do not play a substantial role in shaping long-term progress in advanced L2 academic skills. Pedagogically, these findings support the view that cognitive constraints become attenuated as learners gain experience, automatize linguistic processes, and develop effective learning strategies. Practice, disciplinary literacy exposure, and strategic competence appear to be stronger drivers of continued development. Implications for advanced-level instruction highlight the importance of strategy-based teaching and extensive input rather than cognitive-ability-oriented interventions.

Keywords: *Working memory, phonological short-term memory, longitudinal study, advanced L2 learners, academic literacy.*

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INTERACTIVE ROBOTICS AND MAKER CULTURE IN ENGINEERING EDUCATION: A CASE STUDY

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Abstract
This paper presents a case study on the implementation of interactive robotics as a pedagogical strategy for engineering students at the University of the State of Amazonas (UEA), in partnership with the Samsung OCEAN Digital Fabrication Laboratory (DFL). The study is grounded in the STEM (Science, Technology, Engineering, and Mathematics) framework and the principles of Maker Culture, aiming to develop technical competencies and foster student engagement as a strategy to mitigate academic dropout in the early stages of the program. The intervention adopted Project-Based Learning (PBL), involving a sample of more than 60 students and 20 mentors, impacting approximately 80 UEA students, who led the development cycle of a real-world technological product. The most recent project used as a methodological reference in this study is a robotic health monitoring system. The device integrates sensors for measuring vital signs, such as body temperature and oxygen saturation, also an interactive interface and communication with mobile applications via the MQTT protocol. The process, conducted over eight months, was structured into two evolutionary phases: the first focused on technical training (3D modeling and printing, electronics, and PCB design), and the second was dedicated to system prototyping and integration. A central pillar of the methodology was peer learning, in which senior scholarship students acted as technical mentors. Data collection was carried out through weekly meetings, including performance evaluation and result analysis conducted at the laboratory. The results indicate that the transition from theoretical abstraction to physical prototyping enhances knowledge retention and student motivation. The study concludes that the integration of university–industry innovation infrastructure with active learning methodologies constitutes a scalable model for modernizing engineering education.

Keywords: *STEM, educational robotics, active methodologies, maker culture, engineering education.*

BRIDGING THEORY AND PRACTICE: USING PREDICATE LOGIC AND LAMBDA CALCULUS TO FORTIFY COMPUTING EDUCATION FOR THE AI ERA

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Abstract
This paper investigates a foundational question: *why does functional programming (FP) education improve students' abstract thinking and mathematical reasoning*? Building on our prior empirical findings demonstrating that FP with Haskell significantly enhances these skills, we trace the pedagogical effectiveness of FP directly to two formal systems—Predicate Logic and Lambda Calculus. We argue that Lambda Calculus provides a rigorous model for functional abstraction and composition, enabling students to reconstruct computing from first principles, while Predicate Logic supplies the framework for truth and correctness, enabling precise validation of program behavior. As AI code generators increasingly handle syntactic implementation, the human role shifts to specification, architectural reasoning, and validation. Through theoretical synthesis of literature across formal systems, computing pedagogy, and AI-assisted development, we develop a unified pedagogical framework with concrete curriculum recommendations. We propose a "build-and-verify" pedagogy wherein students construct computational concepts via Lambda Calculus and verify correctness through Predicate Logic, directly cultivating the competencies required for effective human-AI collaboration.

Keywords: *Abstract thinking, Lambda Calculus, Predicate Logic, computing education, AI-era pedagogy.*

STUDENTS' UNDERSTANDING OF DISCRETE SIMULATION MODELS IN VIRTUAL REALITY IN MARITIME EDUCATION

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Abstract
The rapid development of immersive technologies has increased interest in their application within higher education, particularly in courses focused on modelling and simulation. This paper examines how the use of virtual reality influences students perceived immersion when performing simulation-based laboratory exercises. Within the framework of a modelling and simulation course, students initially designed and executed discrete-event simulation models using the FlexSim software in a conventional desktop environment. Subsequently, the same models and simulation tasks were carried out in a virtual reality setting that enables three-dimensional visualization and direct interaction with the simulated system. Following the completion of both learning scenarios, students participated in a post-experiment survey designed to evaluate differences in immersion, engagement, sense of presence, and overall learning experience between the two environments. The study focuses on students' subjective assessments, aiming to determine whether virtual reality provides a more immersive and cognitively engaging context for understanding simulation models compared to traditional computer-based work. Attention is given to how spatial perception and interaction affect students' focus and interpretation of system behaviour. The collected survey data are analysed to identify trends and statistically relevant differences in student responses, offering insight into the educational impact of virtual reality–supported simulations. By comparing experiences across the two modalities, the paper contributes to ongoing discussions on the effectiveness of immersive technologies in engineering and technical education. The results are intended to inform educators and curriculum designers about the potential benefits and limitations of integrating virtual reality into simulation-oriented courses, especially in terms of enhancing student engagement and experiential learning outcomes.

Keywords: *Virtual reality, simulation-based learning, immersion and presence, discrete-event simulation.*

HANDLING CONDITIONAL CALCULATION ALGORITHMS IN SPREADSHEET ENVIRONMENTS

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Abstract
First year students of informatics were tested on their problem-solving strategies in handling conditional calculations in spreadsheet environments. The test was carried out in the first week of the students' tertiary studies to reveal how K-12 education supports building schemata, and how students can call them forth when a problem arises. On the one hand, it is revealed that students cannot activate the algorithm behind the presented problems, they are stuck at the level of hard-coding and apply slow thinking approaches at a low abstraction level. This implies that despite the shared algorithm in the background, the results of the tasks decrease with the increases in the level of abstraction. On the other hand, with an increase in the level of abstraction, students prefer algorithm-driven solutions instead of the environment-specific built-in functions. Considering the results from the learning-teaching approaches, teaching programming should be a "whole programming" approach, where the focus is not on the tools of an environment, but on the development of students' computational thinking skills.

Keywords: *Computational thinking, spreadsheeting, SOLO categories, algorithm.*

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SUPPORTING TRANSFORMATIVE LEARNING FOR SUSTAINABILITY THROUGH BLENDED INTENSIVE PROGRAMME

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Abstract
Blended Intensive Programmes (BIPs) are a recent innovation in European higher education, combining online learning with a short period of physical mobility. Previous research indicates that well-designed short-term intensive formats can support high levels of engagement, interactivity, and constructive learning. This study examines a BIP course titled *STEAMing Food Against Wicked Environmental Problems*, organised at Tallinn University, Estonia, for international teacher education students. The course explored how STEAM pedagogy can be integrated with Home Economics, particularly food education, through practical, real-life activities addressing environmental challenges in various learning environments. Integrating Home Economics with STEAM pedagogy requires diverse learning environments and collaboration, aligning with principles of transformative learning. Transformative learning (TL) involves questioning and reshaping existing assumptions to broaden frames of reference and address complex societal and environmental challenges. This paper examines whether participants' (n = 13) experiences indicate that the BIP functioned as a TL environment. This study combined questionnaire data and documented group reflections to examine students' learning experiences in a BIP. The results show that participants reported learning across pedagogical, sustainability-related, practical, collaborative, intercultural, and professional domains, with particular emphasis on integrating STEAM and Home Economics and applying sustainability-related learning in everyday and teaching practices. The findings indicate that the BIP format supported key elements of TL, including reflection and perspective broadening. Despite challenges related to language and course intensity, the results suggest that short-term BIPs can foster meaningful learning in teacher education.

Keywords: *Blended intensive programmes, transformative learning, sustainability education, home economics, STEAM.*

EMPOWERING EDUCATORS: A TRAINING MODULE TO PROMOTE CIVIC MEDIA LITERACY IN EARLY CHILDHOOD

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Abstract
Early Civic Media Literacy as part of literacy education in early childhood education has so far received insufficient attention in educator training in Germany (Kultusministerkonferenz [KMK], 2017). At the same time, educators report limited confidence in their media-pedagogical competencies and assume only partial responsibility for civic-media education (Kutscher & Bischof, 2020; Mertala, 2019). Addressing this gap, the present study investigates the development and ongoing pre-test of a practice-oriented professional training module designed to foster educators' competencies in teaching Civic Media Literacy. The module builds on findings from the interdisciplinary research project *PoJoMeC*, founded by the German *Federal Agency for Civic Education (bpb)*, which we already presented at the END in 2023 (Tkotzyk, Lategahn, & Marci-Boehncke, 2023). It was demonstrated that children develop early forms of political awareness and that media function as central mediating agents in this process (Goll et al., 2025). Conceptually, the module combines Civic Media Literacy with a socio-ecological perspective (Bronfenbrenner, 1979) and a didactic framework focusing on perception, reflection, and action (Klafki, 1963). Implemented as a digital professional learning environment, the training tool is aligned with the 17 Sustainable Development Goals (SDGs). It addresses professional practice across micro-, meso-, and macro-level contexts of early childhood education. The current pilot study explores the platform's usability and how the materials foster reflective and practice-related engagement with civic-media issues in everyday pedagogical contexts. The ongoing evaluation (April–May 2026) follows a mixed qualitative design. Participants include both in-service early childhood educators and pre-service students. Data are collected through a structured

questionnaire and semi-structured qualitative interviews, focusing on participants' perceptions of the module's clarity, attractiveness, difficulty level, and the contextual fit of its examples and pedagogical scenarios for early childhood settings. Qualitative data are analyzed using qualitative content analysis, complemented by descriptive analysis of questionnaire responses. As data collection is currently in progress, the study will present initial insights into the module's usability and professional relevance, as well as how educators and students engage with civic-media content in a digitally supported professional learning environment. By providing empirically grounded insights into a practice-oriented approach to professional development, the study addresses a significant research gap in the role and impact of civic media literacy training in early childhood education. It offers transferable perspectives for educator professionalization in increasingly mediatized and socially complex learning environments.

Keywords: *Children's civic (media) literacy, early childhood research, educator training, global citizenship education, political awareness.*

ASSESSING NON-COGNITIVE COMPETENCIES FOR STUDENT EMPLOYABILITY IN PSYCHOLOGY INTERNSHIPS

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Abstract
Universities are increasingly challenged to ensure that graduates develop the transversal competencies required for effective professional performance. While prior research consistently shows that non-cognitive competencies play a central role in both academic success and employability, evidence remains scarce on how these competencies are expressed and assessed in authentic internship settings. This study, embedded in a broader national project evaluating key competencies for academic and professional success, aims to advance the understanding of non-cognitive skills that contribute to employability among Psychology students. The main objective of this work is to identify which non-cognitive competencies are most closely linked to students' performance during their compulsory professional internships in the Psychology degree. To address this aim, we will implement a dual-assessment strategy involving final-year students and their internship supervisors. Both groups will complete parallel questionnaires that assess a set of non-cognitive competencies previously identified through qualitative analyses and labor market indicators. The instruments will include sociodemographic questions and a 1–10 rating scale for each competence, accompanied by standardized definitions to enhance clarity and scoring consistency. Data will be collected through a secure online platform, ensuring voluntary participation and informed consent from both students and supervisors. All responses will be anonymized, and students will additionally grant permission to link their internship evaluations with academic performance outcomes obtained during the degree. Analyses will include descriptive statistics and inter-rater agreement coefficients (e.g., Kappa statistics) to examine the convergence between students' self-assessments and supervisors' evaluations. Further studies will investigate the relationships between competence ratings and academic indicators, such as course grades. Based on prior evidence, we expect to observe moderate alignment between self- and hetero-evaluations, with competencies such as responsibility, communication, initiative, and learning autonomy emerging as particularly relevant for stronger internship performance. We also anticipate identifying meaningful patterns related to supervisors' experience and internship context. This study aims to provide an applied framework for evaluating non-cognitive competencies in higher education and to offer practical insights for strengthening internship assessment practices in Psychology. The expected findings will support the refinement of competency-based evaluation systems and contribute to ongoing efforts to enhance students' employability and professional readiness.

Keywords: *Employability, non-cognitive competencies, psychology students, internships, assessment.*

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THE ROLE OF SOCIAL EDUCATORS IN PREVENTING ELDER ABUSE

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Abstract
The article focuses on the analysis of the role of social educators in the prevention of elder abuse, maltreatment, and neglect, with particular emphasis on invisible and latent forms of harm that often remain outside the attention of professionals. The objective of the present study is to ascertain how social educators perceive the issue of violence against the elderly, to what extent they encounter it in their professional practice, what strategies and competencies they use when working with vulnerable seniors, and what barriers prevent them from effective prevention and intervention. The research is conducted using a qualitative strategy involving semi-structured interviews with social educators working in various areas of social services, education, and community work. Thematic analysis of the interviews focuses on identifying professional experiences, perceptions of risk situations, approaches to prevention, and key factors influencing the effectiveness of their activities. It is imperative to note that a significant degree of attention is allocated to the matter of professional training and the opportunities for further education of social pedagogues in the domain of geriatric prevention. The anticipated outcomes indicate that social educators are only peripherally engaged with the issue of elder abuse. However, they frequently encounter inadequate methodological support, a limited interdisciplinary collaboration, and an absence of targeted training. It is anticipated that the study will also reveal discrepancies in the approaches adopted by individual workplaces, as well as in the perception of their employees' professional role. It is anticipated that the findings will inform the formulation of recommendations for the enhancement of professional training for social pedagogues. This will be achieved by means of the development of supervision and methodological support, in addition to the strengthening of community-oriented prevention strategies. The article will thus provide a theoretically grounded and practically oriented contribution to the development of violence prevention among seniors and highlight the potential of social pedagogy in protecting this vulnerable group.

Keywords: *Elder abuse, interview, prevention, social educator.*

LIGHT POLLUTION IN SLOVENIAN CURRICULA: OPPORTUNITIES FOR INTEGRATION IN PHYSICS TEACHER EDUCATION

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Abstract
This study examines how light pollution is represented in Slovenian STEM curricula and explores its pedagogical potential for integration into teaching, with a particular focus on physics teacher education. Using qualitative document analysis, we examined selected primary and secondary school curricula to identify both explicit and implicit references to light pollution and related topics. The results show that light pollution is rarely addressed explicitly, with direct references mainly in secondary school physics. However, it is implicitly present across multiple subjects, including physics, biology, geography, and natural sciences, through themes related to light, energy use, ecosystems, and environmental impacts. The analysis shows that existing curricula provide multiple entry points for integrating light pollution into teaching without requiring major structural changes. In addition, we examined two pilot activities implemented within a higher education physics teacher education program through reflective analysis. The findings highlight the pedagogical potential of light pollution as a context for inquiry-oriented and field-based learning, supporting connections between physics concepts and real-world environmental issues. They emphasize the role of teacher education in translating implicit curricular opportunities into classroom practice. Light pollution thereby emerges as a relevant context for integrative and sustainability-oriented STEM learning, particularly within teacher education.

Keywords: *Light pollution, curriculum analysis, physics teacher education, sustainability, STEM education.*

LEARNING BEYOND WALLS: HOW NATURE-BASED FIELDWORK SHAPES STUDENT WELL-BEING, ENGAGEMENT AND LEARNING

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Abstract
Nature-based education is increasingly promoted as a means of enhancing student learning, well-being, and engagement; however, empirical evidence on dosage effects remains limited. This study examines pre–post changes associated with participation in urban park and forest fieldwork programs delivered by NGO Biospektrum (Slovakia) across two academic years (2024–2025). The dataset comprised 57 students from upper primary and lower secondary students (urban park n = 28; forest n = 29) completed between three and six sessions (M = 4.54). Standardised measures of science learning, well-being, and engagement were administered before and after participation. Gain scores were analysed using linear regression to examine associations between session frequency (dosage) and outcome changes. Mean pre–post gains were positive across domains (science: M = 5.99, SD = 2.97; well-being: M = 6.64, SD = 3.20; engagement: M = 7.13, SD = 3.25). Session frequency was significantly associated with gains in science ($\beta = 0.80$, $p = .040$, $R^2 = .075$), well-being ($\beta = 1.04$, $p = .012$, $R^2 = .110$), and engagement ($\beta = 1.88$, $p < .001$, $R^2 = .345$), indicating that each additional session corresponded to incremental improvements, particularly in engagement. Although gains generally increased with session number, variability across dosage levels suggests that participation intensity alone does not fully account for outcomes. Given the pre–post design without a comparison group and the modest sample size, findings should be interpreted as indicative associations rather than causal effects. Nevertheless, the study provides quantitative evidence linking sustained nature-based fieldwork participation with improvements in engagement, learning, and well-being, and offers practical guidance for integrating structured outdoor education into mainstream curricula.

Keywords: *Nature-based education, outdoor learning, student well-being, engagement, fieldwork pedagogy.*

TEACHING CULTURE IN THE CONTEXT OF FOREIGN LANGUAGES: AN ANALYTICAL PERSPECTIVE

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Abstract
Teaching culture in foreign language education remains a contentious topic, raising complex questions such as: What defines culture? What is its relationship to language? Which culture should be taught, and to whom? What role does learners' own culture play when exposed to the target culture? How can educators avoid cultural embodiment and the teaching of stereotypes? Is it possible to cultivate intercultural competence that harmonizes learners' culture with the target culture, allowing them to serve as cultural mediators without marginalizing their cultural backgrounds? *Objective:* This study seeks to examine these questions through an analytical approach, reviewing a wide range of global research on the interplay between culture and foreign language. *Results:* The findings indicate that cultural embodiment in education can adversely affect the learning experience, emphasizing the importance of learners' own cultures in shaping their understanding of the target culture. The study highlights the potential to develop intercultural competence that balances learners' native culture with the target culture. *Conclusion:* The study recommends expanding researchers' understanding of how to integrate culture into foreign language education in ways that respect and balance diverse cultures. It also advocates empowering learners to become effective cultural mediators within a globally diverse community. This approach offers new insights and innovative methods for teaching culture in foreign language education, contributing to the development of advanced intercultural competencies that enable learners to interact positively and constructively with diverse cultures worldwide.

Keywords: *Linguistic competence, foreign language, intercultural competence، target culture*, *intercultural culture.*

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ESTIMATING THE PREVALENCE OF THE INTERSECTION OF MULTILINGUALISM AND DISABILITY IN LITERACY RESEARCH

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Abstract
Literacy has long been recognized as a fundamental human right. Yet, many multilingual and disabled learners continue to face barriers to equitable, high-quality literacy instruction that is linguistically and culturally responsive. These barriers often stem from inequitable policies, insufficient resources, and deficit-based perspectives toward marginalized students. This prevalence review examined peer-reviewed articles published between 2015 and 2024 to estimate the prevalence of publications that addressed multilingualism and/or disability in literacy research. Through expert nominations, we identified 17 leading journals representing the fields of multilingualism, communication, disability, and literacy. Using a multi-phase, systematic search process, we located 3,115 literacy-related articles in total. Of these, 614 contained our multilingualism keyword search terms in the title and/or abstract, 875 had our disability keywords, and 96 had both multilingualism and disability keywords. Out of 3,115 literacy articles reviewed, only 96 (about 3.08%) contained our keyword search terms for both multilingualism and disability. Communication science journals published the most articles on these intersecting topics. From 2015 to 2024, publication trends related to literacy remained relatively consistent across years. However, numerous journals included no articles with disability and/or multilingualism keywords, while others published only a limited number addressing one or both topics. This pattern reflects a broader lack of interdisciplinary scholarship within the field - especially within bilingual journals, which showed the least overlap with disability. Studies tended to only mention multilingualism or disability separately, mirroring broader policy trends that rarely integrate both. This review faced two main limitations: all consulted experts for identifying journals were based in the United States, and article inclusion relied solely on keywords in titles and abstracts. Future research should use transdisciplinary methods that bridge fields such as speech-language pathology, special education, bilingual education, literacy, and disability studies.

Keywords: *Systematic review, prevalence, multilingualism, disability, literacy.*

BETWEEN ASPIRATIONS AND BARRIERS: MIGRANT-BACKGROUND STUDENTS NAVIGATING ACCESS TO HIGHER EDUCATION IN ITALY

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Abstract
In the context of growing social and cultural diversity, promoting equitable access to higher education represents a key challenge for contemporary education systems. Despite formal commitments to educational equality (UNESCO, 2018), students with a migratory background continue to experience persistent disparities in their educational trajectories across Europe. In Italy, these inequalities are particularly visible in the stratified structure of upper secondary education: students with a migratory background are overrepresented in vocational and technical pathways and are significantly less likely to pursue university studies than their native peers (Bertozzi, 2018; Carlana et al., 2022). Existing research has extensively highlighted structural constraints affecting these students' educational opportunities, including socioeconomic disadvantage, linguistic barriers, and limited familiarity with the education system. However, comparatively less attention has been devoted to how students themselves perceive and interpret the opportunities and limitations they encounter while imagining their post-secondary futures. Examining these perspectives is crucial for understanding how educational aspirations take shape within institutional contexts and how school practices may influence students' expectations and choices. This paper presents preliminary results from an ongoing qualitative study conducted within the research project FINE (*Fighting INequalities in Education. Promoting Access to Universities for Students with Migratory Backgrounds*). The study adopts a participatory design informed by a Student Voice perspective

(Cook-Sather, 2020), which recognises students as knowledgeable actors in interpreting their own educational experiences. The research is currently being carried out in six upper secondary schools in the Lombardy region, selected to reflect the main tracks of the Italian education system (academic, technical, and vocational) and characterised by a significant presence of students with a migratory background. Data collection combines focus groups with teachers responsible for career guidance and 26 focus groups involving 278 fourth-year students, both with and without a migratory background, aimed at exploring their aspirations, perceptions of post-secondary opportunities, and perceived barriers to university access. In addition, a group of students with a migratory background (N = 30) are participating in a four-month digital diary, documenting the evolution of their reflections and expectations regarding their educational futures. By foregrounding students' narratives, the study highlights the interplay between cultural expectations, school guidance practices, institutional norms, linguistic experiences, and socio-economic conditions in shaping educational aspirations. Preliminary findings reveal the complexity of students' decision-making processes and underline the importance of school environments that foster dialogue, guidance, and recognition of students' perspectives in order to support more equitable transitions to higher education.

Keywords: *Migrant-background student, student voice, educational inequalities, access to higher education.*

CREATIVE PEDAGOGY AS AN INTERVENTION TOOL TO ENHANCE READING COMPREHENSION OF HYPERACTIVE LEARNERS IN LANGUAGE TEACHING

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Abstract
Hyperactivity has become an increasingly prominent challenge in contemporary educational contexts. Among neurodivergent learners, students exhibiting hyperactive learning patterns represent a significant subgroup. Within the context of foreign language education in Slovakia, teachers often lack well-established teaching or mentoring strategies that would accommodate the educational needs of these learners, particularly in foreign language pedagogy. Creative pedagogical approaches incorporating multimodal instructional materials, such as metacognitive strategies, techniques of educational drama, experiential learning, and art may therefore provide a promising way for inclusive language learning and teaching. In this study, books with limited words are examined as a potential pedagogical support tool for lower-secondary learners of foreign language. The study examines how narrative-based materials may support engagement, and language enhancement in learners demonstrating hyperactive behaviours. A qualitative case study methodology was employed, focusing on the learning process of two male students aged, 12, 13 over a four-month period. The intervention consisted of a series of guided 45-minute language-learning sessions utilizing selected picture books as the primary instructional resource. Data were collected through classroom observations using selected observation codes. The findings indicate that picture books, if used as suggested in the research, may function as an effective tool that supported sustained attention for longer time periods, and facilitated reading comprehension and foreign language performance of the selected students. At the same time, analysis revealed several areas of difficulties the observed students had in their linguistic competence, specifically, in grammatical accuracy, sentence construction, and narrative fluency. The results suggest that the effects of creative pedagogy intervention may serve as emotional and pedagogical support that foster a more accessible learning environment for hyperactive learners. The study highlights the pedagogical value of multimodal materials in language pedagogy and highlights the importance of individualized strategies when addressing the needs of learners with attention-related challenges and hyperactivity.

Keywords: *Creative pedagogy, hyperactivity, foreign language teaching, reading comprehension, intervention.*

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MATHEMATICAL LITERACY AND AI LITERACY: A CONCEPTUAL BRIDGE FOR INTERPRETING ALGORITHMIC MODELS

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Abstract
The increasing presence of artificial intelligence (AI) in educational and social contexts has intensified the need to clarify what is meant by AI literacy and how it relates to existing forms of literacy. While numerous frameworks describe AI literacy through technical, ethical, or practical dimensions, fewer studies examine its underlying epistemic foundations. At the same time, mathematical literacy, as defined by the OECD/PISA, offers a well-established model of how individuals interpret reality through the formulation, application, and evaluation of formal representations. This paper examines in what sense AI literacy can be theoretically framed as an extension of mathematical literacy, and what shared epistemic structures underpin both constructs. Through a conceptual analysis of established definitions and international frameworks (OECD, UNESCO, and research-based models), which currently remain theoretically disconnected, we compare their core processes, the nature of the models involved, and the role of uncertainty and judgment. The analysis shows that both literacies rely on a common structure of meaning-making: interpreting models, reasoning under uncertainty, and critically evaluating formal outputs in relation to real-world contexts. In AI-mediated contexts, this involves interpreting algorithmic outputs as model-based representations rather than direct reflections of reality. The key distinction lies in the origin of the models. While mathematical literacy engages with human-constructed mathematical representations, AI literacy involves interaction with machine-generated, probabilistic models that mediate knowledge and decision-making. By framing AI literacy as a theoretical extension of mathematical literacy into algorithmic environments, this paper offers a coherent conceptual foundation for future research and the development of integrated literacy frameworks.

Keywords: *AI literacy, mathematical literacy, epistemic structures, algorithmic models, conceptual analysis.*

ONE MARK FOR CHOICE AND TWO FOR JOURNEY TO CHOICE: ENHANCING FAIRNESS WITH MCQS

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Abstract
An assessment involving Multiple Choice Questions (MCQ) from an educator's point of view is easy to administer, no examiner bias and reduced marking time. One pedagogical failing of MCQ questions is the inability to detect whether the student has guessed the answer or eliminated incorrect answers between the students who have genuine knowledge and can distinguish correctly between the given options. This creates a dilemma for educators regarding the validity of the assessment. In an 'all-or-nothing' model, there is no middle ground: a student who knows the material but makes a slip-up is treated the same as a student who knows nothing at all. There are many ways to change the standard MCQ format. For educators to better measure what a student knows, negative marking prevents guessing, whereas weighted marks give credit for near-miss answers that show some understanding. While these two specific modified forms have pros and cons, students seem to like weighted marks because they reward what they know (Schneid et al., 2025). But there is a downside: it adds extra pressure and forces students to play a 'strategy game,' which can be hard for those who are already struggling with the material. To try to address these issues, a modified format was trialled in a Foundation Mathematics course for Health Sciences. Each question was allocated three marks: one for the correct choice and two for relevant supporting work. This approach, supported by a detailed marking guide, transforms 'assumed knowledge' into 'concrete evidence', ensuring the marking scheme reflects what the student is truly thinking and understanding. This trimester, the model is being trialled in a Foundation Statistics course. The presentation will include practical examples of the marking guides used. I invite conference attendees to share their own experiences and suggestions, to help evolve this novel assessment into an assessment tool that works across different disciplines.

Keywords: *Multiple choice questions, procedural, conceptual, fairness.*

POETRY AND TRANSLANGUAGING: CREATING COMMUNITY IN THE ESL CLASSROOM

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Abstract
The term translanguaging, broadly defined, can refer to the use of multiple languages in the classroom, representing students' home or native languages (Garcia & Wei 2015), and is meant to promote multilingualism and intercultural learning (Fuster & Bardel 2024). In the multicultural *English as a Second Language* (ESL) classroom, students should engage with each other's cultures with a purpose of honing intercultural competencies and negotiating meaning in a setting where English is the common language. In fall of 2024, 12 ESL students at a midwestern university in the USA participated in a translanguaging project aimed at metacognitive development, reflection and action. The ESL students represented five different native languages and analyzed poetry with the assistance of the online tool Twine. *Cura personalis*, the education of the whole person, guided the action research. Each student selected a short poem from their own literary tradition and read it to classmates. In the first phase, students listened to each poem read in its native language. They then used a "Wheel of Emotions" with adjectives in English, to describe what emotions the reading of the poem in its native language evoked. Second, the students who read the poem explained what it meant to them, without resorting to a literal translation for the audience. Finally, using dictionaries and *Twine*, students created English translations of their own native-language poems with multiple alternatives for each word/expression, resulting in an interactive experience for the user. Student feedback supports the conclusion that the project created meaningful learning for students, by supporting personal connections, giving students agency and options for using their creativity in a relevant and applicable project. Students learned about their own culture, and about the cultures of their classmates, while using and developing their knowledge of the English language. Through this project, students revealed the polysemic nature of poetic interpretation/translation. The study's findings are limited by the small number of participants but encourage future research.

Keywords: *English as a second language, translanguaging, digital humanities.*

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ORGANIZATIONAL ISSUES

CROSS-CULTURAL LEARNING AS CATALYST: A PHENOMENOLOGICAL EXAMINATION OF TEACHER GROWTH IN BELIZE

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Abstract
This paper describes a federally funded, faculty-led study abroad program for undergraduate and graduate students enrolled in a rural U.S. university-based teacher preparation program. Set in San Ignacio, Belize, the initiative was designed to foreground immersive learning opportunities and facilitate cross-cultural mentor-mentee relationships. Over 10 days, travelers engaged in local school visits and cultural activities, fostering a layered mentoring relationship among undergraduate teacher candidates, graduate students, and local Belizean educators. Using phenomenological research methods (Moustakas, 1994), this study analyzes qualitative data from focus group interviews, written reflections, and capstone projects to illuminate the pivotal learning moments that scaffolded students' professional development. The findings reveal the motivations and behaviors of travelers navigating a multicultural context, suggesting that this layered mentoring model serves as a transformative framework for study abroad programs aiming to prepare teachers for increasingly diverse classroom environments.

Keywords: *Study abroad, teacher education, mentorship, phenomenological research.*

FORGING THE FUTURE OF HIGHER EDUCATION IN THE AGE OF AI, GREEN TRANSITION AND GEOPOLITICAL FRAGMENTATION

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Abstract
This position paper examines the critical confluence of the Artificial Intelligence (AI) revolution, the urgency of the Green Transition and the emerging geopolitical dynamics. It analyses their influence on the future of youth education. It is argued that preparing the next generation requires a curriculum reform that transversally integrates advanced digital competencies, deep understanding of sustainability, and strong interdisciplinary capacity. Simultaneously, we analyse how contemporary geopolitical tension, including fragmentation and competition for technological hegemony, directly impacts international academic collaboration, restricts student and faculty mobility, and reshapes relationships between academia and industry. We propose that Higher Education Institutions (HEIs) adopt a strategic and integrated approach, not only to adapt their curricula to technological and environmental demands but also to proactively navigate a changing geopolitical landscape. This entails innovating internationalization, developing resilient educational models and forging new alliances to ensure the training of globally conscious, technologically competent and ethically responsible citizens capable of leading in an intrinsically interconnected and complex world.

Keywords: *Future of higher education, Artificial Intelligence (AI), green transition, geopolitics, science diplomacy.*

STRENGTHENING RESEARCH SECURITY THROUGH DATA-DRIVEN EXPORT CONTROL TRAINING IN HIGHER EDUCATION

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Abstract
Institutions of higher education increasingly operate at the intersection of open research and national security. Federal mandates now require universities to implement export control and research security training; however, little empirical evidence exists regarding the effectiveness of these efforts. The purpose of this quantitative study was to identify employee experience factors that predict export control awareness among personnel at public universities, informing more effective and targeted compliance training models. This session presents findings from a completed quantitative study examining how organizational learning processes and employee characteristics influence export control awareness, with implications for innovative compliance strategies. Findings revealed that while overall awareness of export control concepts was high, significant disparities existed across specific knowledge areas. Primary employment type emerged as a statistically significant predictor of knowledge of the fundamental research exclusion, with faculty demonstrating substantially lower awareness than staff. These results identify faculty as an at-risk group under current training models and underscore the need for role-responsive, differentiated training approaches. This non-experimental, predictive quantitative study employed a survey of 196 employees from public universities in Texas who had completed export control training within the prior year. Binary logistic regression was used to analyze whether years of experience, frequency of training, education level, and employment type predicted awareness across five export control learning objectives. Participants included faculty, staff, administrators, and research personnel at public universities.

Keywords: *Export control, research security, higher education compliance, organizational learning, training effectiveness.*

LEADING (AND LEARNING) WITH COMPASSION: A LEADERSHIP MODEL FOR TURBULENT TIMES

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Abstract
Across the globe, higher education is in a prolonged period of turbulence marked by demographic contraction, fiscal constraint, policy intervention, technological transformation, protest and unrest, and shifting student aspirations and expectations; there is no end in sight to the turmoil. Conventional managerial approaches emphasizing efficiency and compliance often neglect the ethical, emotional, and learning dimensions essential to institutional integrity and resilience. This paper advances a compassion-centered leadership model integrating ethical reasoning, relational engagement, and organizational learning. Compassion is conceived as a *normative relational practice*—a strategic capacity that aligns moral purpose with institutional adaptability. Drawing on reflective case study methodology, a personal framework of compassionate leadership is articulated through three interrelated pillars: (1) Values-Anchored Leadership, grounded in moral integrity; (2) Relational Leadership, fostering psychological safety and trust; and (3) Learning-Centered Leadership, enabling reflection and continuous adaptation. A case study of faculty resistance to curricular change demonstrates that compassion can transform fear into collective inquiry and collaboration. The analysis concludes that *compassion, courage, and reflective inquiry* constitute a triadic foundation for leading responsibly in higher education's uncertain future.

Keywords: *Compassion-centered leadership, organizational learning, ethical reasoning, relational engagement, higher education change.*

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CRITICAL REFLECTIONS ON LEADING IN EDUCATIONAL CONTEXTS: ENTERING IDENTITY PORTALS

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Abstract
This presentation describes a qualitative, narrative-based critical autoethnography exploring the development of leadership identities of women leaders, including the author, working in various educational settings. As part of the qualitative data collection, the author interviewed eight leaders in disparate contexts: K-12 administration, university administration, university center directorships, community leadership, state politics, and university coaching. These participants are all female leaders in high-impact areas of education representing diverse leadership contexts and cultural backgrounds. They have varied levels of experience (from two years to over forty years) and work in K-12 schools, universities, politics, research centers, and community non-profit organizations. The researcher layers key findings from these participant stories with her own experiences documented in journal narratives and through previous publications, as well as with dominant US cultural ideologies about leadership, to capture the lived experiences of participants. Perhaps most uniquely, the researcher also understands leadership identity through the lens of the animal-human bond, by integrating personal experience and scholarship about animals and their complex, evolutionary relationships with humans. This project is grounded in interdisciplinary scholarly research and theory exploring leadership, identity, mentoring, empathy, feminist thought, and animal studies. The project also continues and extends the author's existing scholarship on professional identity discourses as a pathway to growth. The author's research aims to better understand the leadership trajectories of women leaders in educational settings and, by extension, inspire and transform young women thinking about leadership to enter so-called "identity portals" and become leaders. This research accomplishes what other projects about leadership do not: it combines storytelling and narrative research, contextualized by interdisciplinary scholarship, to better understand how to become, and be, an effective educational leader. This presentation will focus on key aspects of the larger project, including the centrality of empathy/emotional intelligence to strong leadership and how successful leaders approach challenges and failures. The presentation ends with an overview of six practical 'leadership intelligences' that mentors, leaders, and would-be leaders can internalize and enact to enrich their leadership lives.

Keywords: *Leadership, identity, narrative, animal studies.*

INTERPLAY OF INCLUSIVE PRACTICES IN COMPULSORY SCHOOLS, TEACHER EDUCATION AND EDUCATIONAL RESEARCH IN ICELAND

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Abstract
The significant rise in immigration to Iceland over the past two decades has led to increased diversity in schools, prompting growing interest in how educational systems include immigrant students. This paper investigates how schools, teacher education, and research practices influence immigrant students' experiences in educational settings. Specifically, it examines how rural and urban compulsory schools in Iceland, along with teacher education and research, address opportunities for inclusion. The research question is: How do the education system and education research engage with immigrant students to promote, develop, and sustain inclusive practices that leverage everyone's social, linguistic, and cultural resources? Addressing a gap in the literature, this study examines the interplay among research, teacher education, and school practices. Employing a range of qualitative methods—including classroom observations, semi-structured interviews with teachers and immigrant students, a collaborative self-study with teacher educators, and a critical autobiography—the research is analysed thematically using frameworks of inclusion, critical pedagogy, and the ecology of equity. Findings emphasize the pivotal role teachers play as agents of inclusion. Despite limited training or resources, many teachers strive to engage all students meaningfully in learning. Supportive school environments and strong teacher-student relationships further contribute to students' sense of belonging. However, systemic challenges—such as shifting demographics and resource constraints—highlight the need for broader structural reform. Insights from teacher educators emphasize the value of open dialogue in diverse classrooms, while the researcher's

critical autobiography underscores the importance of maintaining reflexivity to avoid reproducing bias. Using Ainscow et al.'s (2012) ecology of equity framework, the study concludes that while the researched schools stand on their own in tackling issues *within school*, these practices have an important impact on students' experiences of inclusion and may unintentionally reinforce inequalities between schools. At the same time, the schools seem to tackle *between school* issues in different ways. Such autonomy in implementing policies, varied local responses and the lack of consistent policy guidance may lead to unequal educational opportunities for immigrant students and the professionals who support them. When it comes to *beyond school*, broader social and economic contexts significantly shape students' experiences of inclusion. Real progress toward educational equity requires collaboration across schools, teacher education, research, and policymaking. This study contributes theoretical, empirical, and practical insights into how inclusion is conceptualized and enacted in Icelandic education. It underscores the importance of coordinated and cross-sector efforts to promote equity and inclusion in a rapidly diversifying society.

Keywords: *Immigrants, inclusion, compulsory education, teacher education, case studies.*

MENTORING AS A TRANSFORMATIVE EDUCATIONAL PRACTICE: GENDER PROCESSES, INCLUSIVE LEADERSHIP AND INSTITUTIONAL CHANGE AT INFN

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Abstract
Gender inequalities in research organizations cannot be explained solely by individual factors, but are produced and reproduced through organizational processes, informal practices, and implicit models of power and leadership. Within this framework, mentoring can serve as a strategic educational practice, fostering critical awareness, transformative learning, and institutional change. This contribution introduces the Gender Mentoring Programme (GMP) developed at the Istituto Nazionale di Fisica Nucleare (INFN), Italy, as a structured and permanent educational practice established in 2018, aimed at simultaneously fostering individual development and shaping organizational culture within the institute. The programme is grounded in a bifocal approach that combines mentoring as support for professional careers with explicit actions addressing gender-related processes that affect evaluation, access to networks, power relations, and leadership across the institution. Through peer and intergenerational mentoring, mentee and mentor training, collective reflective spaces, and self-observation tools, the GMP promotes forms of informal and continuous learning oriented toward the deconstruction of dominant models of excellence and leadership, often associated with competitiveness, apparent neutrality, and gendered norms. Particular attention is devoted to the relationship between mentoring and sponsorship, reframed in an inclusive perspective as a practice aimed at redistributing opportunities, visibility, and recognition, while challenging exclusive networks and gender homophily. Mentoring is thus interpreted as an educational and organizational practice oriented toward the construction of more equitable and inclusive research and working environments, where relational quality, shared responsibility, and the valuing of differences become central elements of learning processes, leadership development, and institutional growth. In addition to the points discussed above, mentoring is a developmental and identity-forming academic practice. As such, it plays a crucial role in preparing a new generation of researchers, who will in turn support and educate future generations through university teaching and outreach activities.

Keywords: *Gender equality in higher education, mentoring programmes, organizational change, inclusive leadership, professional identity development.*

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THE INTELLECTUAL AND POLITICAL POWER OF MUSEUM: IN LIGHT OF SHADOW EDUCATION IN HISTORY TEACHING

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Abstract
This paper examines the role of history museums in light of their intellectual influence and political power demonstrated behind their presentations. It argues that past incidents are presented as 'history' through the filters of various actors working within the museums, for example, the founding institution(s), organizers and staff members such as curators of the museums. It is also argued that historical interpretations and values attached to their presentations are based on the choice of exhibition articles, captions or narrations given to them, and the route indicated for visitors to follow within the exhibitions. In recent years, various educational programs are also offered to visitors, especially school children of different ages, educational levels and intellectual interests. In examining the arguments, an example is drawn from the case of presentation of the modern history of Okinawa in Okinawa Prefectural Peace Memorial Museum (OPPMM). Specifically, it investigates how differently World War II and the Battle of Okinawa are presented in the local museum in Okinawa. Okinawa is Japan's southernmost inhabited prefecture, and the only prefecture where the Japanese and US forces fought land battles during the war, resulting in the deaths of one quarter of Okinawa's civilian population. The investigation focuses on the selections and photos and the captions given to them used in the exhibitions and publications by the OPPMM. The paper pays special attention to the different presentations of the war and the battle in the museum's exhibition and in official history textbooks. In the case of OPPMM, the representation of history of the war at the museum shows certain schematic accounts that are opposed to those of the central government which are often demonstrated on school textbooks.

Keywords: *History education, museum, World War II, The United States, Okinawa.*

PREPARING ACADEMIC CHAIRS FOR LEADERSHIP: PROFESSIONAL DEVELOPMENT, ROLE TRANSITION AND INSTITUTIONAL SUPPORT

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Abstract
Academic chairs hold one of the most important yet least supported leadership roles in higher education. They are responsible for most institutional decision-making but receive little to no targeted professional development. Despite the complexity and scope of the role, faculty are often appointed to chair positions without the necessary training to handle administrative, interpersonal, and strategic challenges. This session shares findings from a completed basic qualitative study examining how academic chairs at four public universities in South Texas perceive the impact of professional development, or the lack thereof, on their transition into leadership. The descriptive qualitative study investigated the knowledge, skills, and abilities that contribute to chair effectiveness and identified barriers hindering successful leadership transitions. Data were collected through semi-structured interviews with current academic chairs who have served in this role for a minimum of two years. All participants reported that their institutions offered professional development opportunities; however, a significant gap persisted between the role's demands and the training provided. These results highlight a clear and ongoing gap in academic leadership preparation and emphasize the need for role-specific, tailored professional development programs designed to equip academic chairs with the competencies necessary for effective departmental leadership.

Keywords: *Academic chair, higher education leadership, professional development, leadership transition, team leadership.*

IDENTIFYING PREDICTORS OF SCHOOL VIOLENCE: LESSONS FROM SEVEN INCIDENTS USING A STRUCTURED WARNING-SIGN TYPOLOGY

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Abstract
School violence remains a growing concern in Central Europe, yet empirical analyses of specific incidents are limited. This study aims to identify recurring behavioural warning signs preceding serious violent acts in school settings. Using a structured comparative case-study design, seven violent incidents that occurred in Czech and Slovak schools between 2014 and 2025 were analysed. The analytical framework applied Brečka's typology of 44 warning signs of aggression, enabling systematic identification of present indicators and their intensity. Data extracted from verified public sources were coded across all 44 categories. The analysis revealed that all seven incidents were preceded by at least one high-intensity warning sign, and that three indicators appeared most consistently: low frustration tolerance and poor stress coping (6/7 cases, always strong intensity), hostility toward a specific individual (6/7), and a perceived sense of injustice (5/7). Additionally, leakage of intent occurred in 6/7 cases, although usually with low recognisability. Two incidents exhibited seven distinct warning signs, indicating substantial missed intervention opportunities. These findings provide structured evidence for the practical relevance of warning-sign monitoring in school environments. The study concludes that early detection, interdisciplinary communication, and crisis preparedness remain critical weaknesses in current practice. Implications for prevention frameworks and school safety policy are discussed.

Keywords: *School violence, behavioural warning signs, psychological risk factors, aggression assessment, prevention strategies.*

CRITICAL REFLECTION AND ETHICAL AWARENESS IN STUDY ABROAD: HIGH IMPACT PRACTICES FOR INTERCULTURAL COMPETENCE

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Abstract
This qualitative study explores how study abroad experiences shape students' intercultural competence, identity, and ethical awareness. While study abroad research has widely examined intercultural competence development, fewer studies explore the ethical and relational dimensions of these experiences. Understanding how students develop ethical awareness and reciprocal relationships during study abroad can provide deeper insight into how intercultural competence is enacted in practice. Our framework is grounded in intercultural competence with an emphasis on competence as a relational and ethical practice rather than a static skill. This study draws on interviews with 28 U.S. university students who completed short-term study abroad programs across diverse global contexts, including Latin America, Asia, and Europe. Utilizing inductive and axial coding, data analysis reveals themes of relational learning, ethical responsibility, and transformation. Experiential, hands-on activities serve as catalysts for students' reflection and personal growth. Ethical responsibility and reciprocity are shown as core dimensions of intercultural learning. Students emphasize respect for host cultures and reported acting as cultural mediators within peer groups. Findings also expose structural inequities limiting access to study abroad. This study reframes intercultural competence as an ethical and relational practice. Finally, we offer strategies for equitable program design and reflection integration and recommendations for expanding access and centering ethical engagement in study abroad.

Keywords: *Intercultural competence, study abroad, ethical awareness, cultural mediation, relational learning.*

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EDUCATIONAL MARKETING AS A LEADERSHIP AND POLICY TOOL IN SCHOOL ORGANIZATIONS

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Abstract
In an increasingly competitive and complex educational environment, schools are required to respond to demographic changes, accountability pressures, parental choice, and growing expectations for transparency and quality. Within this context, educational marketing is often narrowly perceived as a promotional or communication activity. This paper argues that educational marketing should instead be conceptualized as a strategic leadership and policy tool that supports organizational development, informed decision-making, and sustainable school improvement. Drawing on a leadership- and policy-oriented framework, the paper explores educational marketing as a means of strengthening communication, fostering strategic relationships between schools and local communities, and enhancing school identity and social legitimacy. The theoretical section distinguishes educational marketing from commercial practices, emphasizing its educational, social, and communicative dimensions, as well as its role in improving school performance and responsiveness to community needs. The role of the school principal is highlighted as central to the effective management of communication and the development of strategic relationships within and beyond the school organization. Empirically, the study employs qualitative research approach through the analysis of 15 interviews with primary and secondary school principals, which were thematically examined across key analytical axes, including school communication practices, the use of digital tools and school websites, collaboration with the local community, strategic promotion activities, leadership approaches to communication and marketing, perceived challenges, and differences in practices related to school type. The findings reveal the presence of communication strategies alongside significant challenges, such as limited parental involvement, technological constraints, and communication barriers. By reframing educational marketing as an organizational and leadership process rather than a market-driven practice, the paper contributes to contemporary debates on educational policy, school leadership, and organizational change. The findings suggest that educational marketing can enhance school quality, effectiveness, and public trust, supporting more reflective, value-based, and sustainable leadership practices in school organizations. Overall, the paper offers policy-relevant insights for educational leaders and decision-makers, highlighting how educational marketing can be strategically integrated into school leadership practices to support organizational coherence, community engagement, and sustainable educational improvement.

Keywords: *Educational marketing, school leadership, educational improvement strategies, school image, public schools.*

"SAYING THE QUIET PART OUT LOUD": STUDENTS' PERCEPTIONS OF THE IMPLICIT CURRICULUM IN THE U.S.

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Abstract
Teaching and learning across classroom, community, and online contexts are shaped by broader social, political, and organizational environments. In the United States, social work programs are required to demonstrate student competency in diversity, equity, inclusion (DEI), and anti-oppressive practice, even as DEI initiatives are increasingly dismantled through federal and executive actions that constrain institutional commitments to equity. Professional programs preparing social workers, counselors, and mental health practitioners must therefore navigate a profound contradiction between accreditation expectations and a hostile policy environment. Using a critical interpretive approach, this study analyzes written responses to open-ended survey questions from Bachelor of Social Work and Master of Social Work students (N = 167) enrolled at a predominantly White public university in the Midwest during Spring 2022, as part of a larger mixed-methods study. Qualitative analysis revealed five thematic domains: student support services; experiences with faculty and academic advising; courses and coursework; sense of community and experiences with discrimination; and internship and field placement. Student responses were highly

polarized, revealing isolated examples of excellence alongside systemic deficiencies. Students identifying as racial and ethnic minorities, LGBTQ+, international, and/or disabled described microaggressions, silencing, and limited institutional responsiveness to reported concerns. Theoretically, the findings advance implicit curriculum theory by conceptualizing organizational culture as the primary carrier of the implicit curriculum and as a site of institutional contradiction, where professed commitments to social justice coexist with practices that reproduce harm. The study demonstrates how silence, avoidance, and procedural delay operate as forms of institutional power, rendering equity efforts performative rather than transformative. By introducing "saying the quiet part out loud" as an analytic frame, the study positions student voice as critical institutional knowledge that challenges dominant narratives of compliance, satisfaction, and accreditation legitimacy. Collectively, the findings underscore that revising explicit curriculum without addressing implicit curriculum and the organizational culture risks reproducing inequities and harm.

Keywords: *Implicit curriculum, social work, student experiences, critical interpretive.*

TEACHER EMOTIONAL WORK AS INSTITUTIONAL PRACTICE IN CONTEMPORARY EDUCATION

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Abstract
Teacher recruitment and retention in England has been problematic since 2011, despite the recent pay increases. Emotional labour (EL) is a well-researched concept in the service sector and has been given some attention in academic research in education. EL is defined as 'the management of feeling to create a publicly observable facial and bodily display' (Hochschild, 1983). Teachers are implicitly expected to exhibit EL in the course of their work and this can have an impact on their wellbeing. Yet, teachers' understanding of EL is under-researched. This study uses an interpretivist paradigm, acknowledging that everyone will experience emotional labour in a unique way. Drawing on 3 focus groups and 1 interview with teachers across primary, secondary, and special education in England, the findings reconceptualise emotional labour as moral institutional negotiation work, a reflexive process through which professionals reconcile personal ethics of care with procedural logics of accountability. Thematic analysis (Braun and Clarke, 2006) has been used to identify common ideas and understandings while honouring the voices of the participants. This study has discovered that teachers have little theoretical understanding of emotional labour and even less training in how to manage this aspect of their job. Since teachers consider emotional labour to be mainly centred around the care and emotional connection they have to their work and their students, they risk burn-out and compassion stress injury (compassion stress injury (CSI) as a unifying term when referring to the emotional detriment from the second-hand experience of suffering, coupled with a desire to alleviate it, rather than a direct personal involvement in a traumatising or upsetting event, Briggs, 2022) both of which can hinder wellbeing. Teachers' accounts reveal that emotion management operates not as compliance with display rules but as moral reasoning enacted through practice. Emotional labour becomes a means of preserving ethical integrity, sustaining moral economies, and maintaining institutional legitimacy under constraint. The study extends emotional-labour theory by reinterpreting emotion as a site of moral agency, advances the moral-economy perspective by specifying negotiation as the mechanism of moral reproduction, and illuminates how relational economies of humour, empathy, and recognition sustain ethical life within bureaucratic systems. Once this is illuminated in education, strategies to encourage and support these relational economies could help reduce burn out and improve teacher retention. Importantly, not only will this improve retention but if the students of teachers see their working conditions being acknowledged and supported, more may consider teaching as a career for their own futures, having a knock-on impact for recruitment as well.

Keywords: *Emotional labour, moral economy, moral–institutional negotiation, relational care, teaching profession.*

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REFRAMING LEADERSHIP AND POLICY IN IMMERSION EDUCATION: GOVERNANCE CHALLENGES AND STRATEGIC DIRECTIONS FOR IRISH-MEDIUM POST-PRIMARY PROVISION

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Abstract
Immersion education has become a significant feature of contemporary language-in-education policy, with Irish-medium education in Ireland representing a distinctive bilingual enrichment model that seeks to achieve summative bilingualism, biliteracy, and cultural revitalisation. While the sector has expanded substantially since the 1970s, recent growth has exposed structural and leadership challenges, particularly within Irish-medium units operating under the management of English-medium post-primary schools. This paper examines immersion education provision in these units through the lens of educational leadership and policy. Investigating current provision in Irish-medium units through a mixed-methods research design, data were gathered using a large-scale online questionnaire, semi-structured interviews, and online discussion fora with key stakeholders. Quantitative and qualitative analyses were triangulated to validate findings and ensure robustness. Results indicate that while Irish-medium units positively influence language maintenance and school culture, significant leadership and policy gaps persist. These include the absence of a shared vision for immersion education, inconsistent leadership roles, limited professional development, and weak systemic support. The study concludes that these challenges reflect inadequate strategic leadership at policy level. It recommends a reconceptualised, leadership-driven model of provision, specifically stand-alone Irish-medium units under Irish-medium governance, to enhance coherence, accountability, and educational quality in immersion education.

Keywords: *Immersion, bilingual education, educational leadership, policy.*

PEER TUTORING AS A STRATEGY FOR PREVENTING ACADEMIC FAILURE AND SUPPORTING STUDENT PERSISTENCE

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Abstract
Student dropout remains a significant challenge in higher education, particularly in natural science programs characterized by demanding curricula and high academic expectations. At the University of Ostrava, Faculty of Science, this issue has been addressed through a comprehensive institutional strategy aimed at strengthening students' motivation, adaptation, and persistence throughout the study lifecycle. The strategy identifies critical stages in the student journey and proposes targeted interventions that can be implemented quickly within the institutional environment. One of the key areas identified is the transition to university studies and the first semesters, when students often encounter academic barriers, insufficient prior knowledge, and difficulties in adapting to the demands of higher education. In response to these challenges, the Faculty of Science has introduced "dOUčko", a peer-tutoring program providing academic support in foundational courses through consultations led by trained senior students. The contribution will cover the conceptual background, implementation model, and evaluation of the program during its first two years of operation. The analysis is based on institutional data on program participation and feedback collected from participating students. The findings indicate a growing demand for peer tutoring and suggest that the program contributes to improved understanding of course content, increased study confidence, and better academic integration of students. The results highlight the potential of peer-learning initiatives as an accessible and scalable intervention supporting student success and reducing dropout risk in science education.

Keywords: *Peer tutoring, student persistence, dropout prevention, higher education, science education.*

SAFE SCHOOLS IN THE DIGITAL AGE – CHILD RIGHTS-BASED DIGITAL POLICIES IN EDUCATION

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Abstract
Children's increasing engagement in digital environment poses significant challenges for education systems, particularly regarding institutional responsibility for safeguarding children's rights beyond the physical school space. While international child rights standards increasingly emphasise the duty of States and educational institutions to ensure safe and inclusive digital environments, school-level implementation often remains fragmented and underregulated. This paper examines how Hungarian primary schools address digital behaviour, online safety, and cyberbullying within their Internal School Regulations (*házirend*), understood as key instruments of school-level governance. Despite the relevance of international norms—mainly the UN Convention on the Rights of the Child and General Comment No. 25—there is currently no binding national guidance in Hungary requiring schools to regulate online conduct or digital harms within their institutional frameworks. The study addresses two research questions: (1) To what extent do Hungarian primary schools regulate device use, online behaviour, and cyberbullying through their internal regulations? (2) How can a child rights–based analytical framework be developed that is capable of serving as a foundation for the design of internal school policies governing online behaviour? Methodologically, the research combines a qualitative content analysis of 20 randomly selected internal school regulations, one from each county in Hungary assessed against a child rights-based coding framework. It is not representative, but illustrative in nature. The analysis focuses on institutional responsibilities, procedural safeguards, complaint mechanisms, and the integration of child rights principles into organizational rules. The paper argues that ensuring safe digital school environments is not solely a pedagogical or technological issue, but a matter of educational governance and organizational accountability. It concludes by identifying core elements for a centrally supported, flexible regulatory template grounded in a child rights-based approach, aimed at strengthening institutional responses to digital risks while supporting equity, participation, and social justice in education.

Keywords: *Organizational issues, educational policy and leadership, right to education, online children's rights, institutional responsibilities.*

TOWARDS LEARNING ORGANIZATIONS - DIGITAL COMPETENCE DEVELOPMENT IN SMES

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Abstract
Digitalization is advancing rapidly, and companies must keep up with developments to remain competitive. The speed and scope of digital transformation pose challenges for small and medium-sized enterprises (SMEs) in industry and logistics, whose development is hampered by limited resources and varying skills levels. A key barrier is the lack of competence required to adopt and utilize digital technologies—both at the management level and among employees. In these companies, systematic competence development is also rare. The LogDigiS project (Building Digital Competences, Work Well-being, and Productivity for In-house Logistic SMEs) examined the digital skills and systematic competence development practices of SMEs characterized by low levels of formal education in industry and logistics industries. One target of the study was exploring how companies' competence development responds to the need for developing digital skills. The quantitative study based on data collected from employee survey on well-being at work and competence in 13 small industrial or logistics enterprises in Finland. The survey was conducted in autumn 2025. An electronic survey received 229 respondents. The survey followed Otala's (2018) learning organization framework. The survey investigated the systematic nature of competence development, the level of digital skills, the willingness and need to develop digital competence, and the perceived importance of developing digital skills. Findings show gaps in how companies identify and respond to competence needs. The survey showed, that 44% of respondents were completely or somewhat unaware of whether skills needs are being assed. Employee motivation to develop digital competence was high: 86% expressed strong interest in upskilling. Open-ended responses adduced competence needs related to information

technology, digital tools, analytics, and artificial intelligence. Management representatives recognized the importance of digital skills, with 96% rating the use of ICT and software as fairly or very important. But only 16 % of respondents felt they had received sufficient training in the digital skills needed at work and in the use of devices and software. Willingness to acquire new digital skills was high, 47% reporting strong interest to developing. In summary, the results show that while employees exhibit strong motivation and clear needs to develop their digital competence, companies lack systematic approaches to competence development and do not regularly assess competence needs. To keep up with the development of digitalization, must strengthen systematic competence development and improve their awareness of employees' digital capabilities as well as their broader competence needs.

Keywords: *Digital competence, SMEs, competence development, learning organization, digital transformation.*

MAPPING STUDENT PATHWAYS IN EXTENDED CURRICULUM PROGRAMMES: A SANKEY FLOW ANALYSIS (2016–2025)

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Abstract
In South Africa, Extended Curriculum Programmes (ECPs) are designed to enhance access, retention, and academic success for students entering higher education with varying levels of preparedness. The primary aim of this study was to visualise and interpret patterns of progression, retention, transfer, and dropout in order to inform evidence-based curriculum restructuring and programme design. The research shifted focus from legacy extended curriculum structures toward the development of newly introduced programme models, namely the Four-Year Bachelor of Commerce (BCom) Programmes and the Four-Year and Five-Year Bachelor of Science (BSc) Foundation Programmes. A retrospective cohort design was adopted using institutional administrative data collected across a ten-year period. The dataset comprised all first-time entering students registered in Extended Curriculum Programmes within the Sciences and Commerce streams. Descriptive statistics were utilised to summarise cohort characteristics and key performance indicators, while Sankey flow analysis served as the principal analytical and visualisation tool. This approach enabled the mapping of student transitions between academic levels, programme streams, and exit points, revealing both linear and non-linear pathways. The findings demonstrated that student trajectories were diverse and frequently non-sequential, with concentrated movement occurring within the first two years of study. Sankey visualisations highlighted recurring transition nodes and academic bottlenecks, as well as common transfer routes between disciplinary areas. Analysis of pathway-to-graduation data further revealed that a significant proportion of students achieved completion through indirect or extended routes, underscoring the need for increased curricular flexibility and integrated foundational support in early years of study. The results provide practical insights for academic planners and policy developers seeking to strengthen monitoring practices and enhance programme responsiveness to student needs.

Keywords: *Extended Curriculum Programmes, Cohort analysis, Sankey analysis, curriculum restructuring, retention.*

POSTERS

TEACHERS AND STUDENTS

PERCEIVED SOCIAL SUPPORT IN HIGH-ABILITY, LEARNING DISABILITIES AND REGULAR STUDENTS: THREE GROUP COMPARATIVE ANALYSIS

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Abstract
Family, peers, and teachers constitute core developmental contexts that shape adolescents' adjustment and wellbeing. Previous research has shown consistent associations between perceived social support and students' academic and psychological outcomes. However, little is known about whether these perceptions differ across the diverse learner profiles typically found in secondary education. This study examines perceived social support among three groups of Spanish secondary students: regular students, students with learning disabilities, and high-ability students, for a total of 183 participants. Perceived support was assessed using three subscales from the Spanish version of the Relational Support Inventory-Adolescence (RSI-A), which measures perceived emotional support, guidance, and reassurance of worth from family, peers, and teachers. Most sources and types of support showed no significant differences across groups. However, two teacher-related dimensions revealed meaningful variation: high-ability students reported higher perceived emotional support from teachers and greater perceived reassurance of worth from teachers compared with both regular students and students with learning disabilities. These findings highlight teachers as a differentiated source of support across student groups and underscore the importance of considering learner characteristics when evaluating perceived support in school settings.

Keywords: *Perceived social support, secondary students, high ability, learning disabilities, comparative analysis.*

APPLICATION AND ASSESSMENT OF LEARNING OUTCOMES IN THE COURSE COMMUNICATION IN SPORT THROUGH CASE STUDIES

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Abstract
This paper presents the learning outcomes and methods of their assessment in the graduate-level course titled *Communication in Sport*. The aim of the course is to familiarize students with the basic elements of communication in sports, various forms of internal and mass communication, and the analysis of the behavior of sports audiences and other stakeholders. Special emphasis is placed on the role of both traditional and new media and technologies in shaping contemporary communication processes in sports. The learning outcomes include recognizing the specific features of sports communication, distinguishing communication at different levels, analyzing and reassessing the behavior of sports audiences, as well as understanding communication capacities and strategies. The assessment of learning outcomes is based on active learning methods: analyses of concrete examples, teamwork, and individual analyses. A key element of the assessment is a task in which students, using the example of a selected sports organization or athlete, present a communication strategy, techniques, and methods of communicating with relevant stakeholders. This approach enables students to connect theoretical concepts with practice and to develop the competences necessary for understanding and improving communication processes in the sports environment. The results show that the course fosters professional knowledge and effective communication among stakeholders in sports.

Keywords: *Sport, communication, communication strategy, learning outcomes.*

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INVESTIGATING THE IMPACT OF CHATGPT IN FACILITATING K-12 PRE-SERVICE TEACHERS' DEVELOPMENT OF INDIVIDUAL TEACHER RESOURCE WEBSITES

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Abstract
With the recent advances and growing potential of generative artificial intelligence (GenAI) in education, schools find it increasingly challenging to manage rapidly evolving GenAI-driven technologies yet impossible to resist riding the AI wave. In July 2025, the U.S. Department of Education issued official guidance on the use of artificial intelligence in U.S. schools. Teacher education stands at the forefront of this transformation, playing a vital role in preparing K–12 pre-service teachers with essential GenAI knowledge, skills, and competencies. ChatGPT, one of the most widely used GenAI tools, offers a promising platform for meeting these training needs. This study investigates whether the use of ChatGPT can facilitate K–12 pre-service teachers' ability to develop individual teacher resource websites and foster more positive attitudes toward AI integration in teaching. Participants will include pre-service teachers enrolled in an undergraduate Educational Technology course at an urban public university in the Midwestern United States. Over a twelve-week period, participants will engage in two phases: a baseline phase using traditional methods and an intervention phase incorporating ChatGPT to develop individual teacher resource websites. The findings are expected to offer insights into how ChatGPT can facilitate the development of practical teacher resource websites and contribute to the design of effective, AI-supported instructional materials and activities.

Keywords: *Generative Artificial Intelligence, GenAI, ChatGPT, K–12 pre-service teachers, teacher resource website.*

RISK IDENTIFICATION AND PROPOSAL OF PREVENTIVE MEASURES IN THE MANAGEMENT OF STUDENT PROJECTS IN AN ACADEMIC ENVIRONMENT

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Abstract
The implementation of student projects at the university level represents not only an opportunity for the development of students' professional and soft skills but also brings a number of risks that can affect the quality of outcomes, the effectiveness of teaching, and the educational process itself. This paper focuses on the identification and analysis of risks associated with managing student projects in an academic environment. To systematically examine the causes of potential problems, the Ishikawa diagram (also known as the fishbone diagram) is used, enabling the visualization of key factors influencing the success of project-based learning. The analysis includes technical, human, organizational, and methodological aspects, and based on the identified risks, preventive measures are proposed to minimize their impact. The research also involved brainstorming sessions with students and educators, which contributed to a deeper understanding of the practical challenges in project implementation. The results of this analysis serve as a foundation for teaching the course Projects and Construction Materials at the Faculty of Education, with particular regard to the needs of technical education teacher training. They may also serve as inspiration for educators in planning and implementing student activities.

Keywords: *Risk identification, proposal of preventive measures, management of student projects, Ishikawa diagram, brainstorming with students and educators.*

MAPPING FINANCIAL LITERACY IN GERMAN VOCATIONAL EDUCATION: A CURRICULUM ANALYSIS ACROSS FEDERAL STATES

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Abstract
Financial literacy (FL) encompasses the knowledge, skills, attitudes, and behaviors required to make informed financial decisions (EU & OECD, 2022). There is a growing call to integrate FL into formal education (Schuler & Brahm, 2021), which is also reflected in a proposed national education strategy (OECD, 2024). In order to respond to this demand, a systematic overview of how FL is addressed in school curricula is required. FL is particularly relevant for students in vocational education and training (VET), as they typically enter employment and face changes in their financial situation, including income and expenses such as housing and transportation. Given the substantial overlap in curricular content across commercial occupations, vocational schools represent a suitable context for examining the integration of FL. To date, however, no comprehensive curriculum analysis of FL in German vocational schools exists. To address this research gap, a curriculum analysis of vocational school curricula across German federal states is being conducted, drawing on the analytical framework proposed by Schuler and Brahm (2021). Although the analysis has not yet been completed for all federal states, previous research indicates notable differences between states in the field of economic education (Fortunati & Winter, 2024). The analysis will identify where and to what extent FL is addressed in German vocational school curricula. Based on these findings, the paper aims to derive recommendations for the development of a national education strategy that integrates vocational education and contributes to the establishment of more uniform learning standards across federal states.

Keywords: *Financial literacy, vocational education, curriculum analysis, national education strategy.*

PERCEPTUAL VISUAL MOTOR PERFORMANCE OF 5 YEARS OLD BRAZILIAN PRESCHOOLERS: PRELIMINARY STUDY

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Abstract
*Introduction***:** Perceptual visual motor development in childhood is essential for learning to write, as it depends on the integration of visual perception and fine motor coordination. Difficulties in this process can compromise school performance. Therefore, early assessment can identify risks and plan interventions in early childhood education. *Aims:* This study aimed to characterize and analyze the perceptual visual motor performance of 5 years old Brazilian preschoolers. This is a cross-sectional study with a qualitative and quantitative approach, conducted with 20 preschoolers of both sexes, aged 5 years to 5 years and 11 months. Individual assessment was performed using the Developmental Test of Visual Perception – 2nd ed. (DTVP-2) in the domains of General Visual Perception (GVP), Visual Perception of Reduced Motor Skills (VRM), and Visual Motor Integration (VMI). data were analyzed using the nonparametric Friedman test. The analyses revealed significant weaknesses in the visual motor integration subtests, indicating specific difficulties in visual motor coordination. The analyses also showed that perceptual visual motor development evolves gradually throughout early childhood. However, visual-motor coordination emerges as a particularly challenging domain for this age group. The results reinforce the importance of early assessment and systematic intervention of these skills in early childhood education to promote the development of handwriting.

Keywords: *Early childhood education, handwriting, hand-eye coordination, perceptual visual motor.*

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APPROACHING SUSTAINABILITY FROM A UNIVERSITY CONTEXT. THE CREATION OF A MEASURMENT SCALE

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Abstract
Sustainability has become a priority in higher education, where university students play a key role as both learners and agents of change. Recent studies show that students' attitudes, knowledge and behaviors toward sustainability are shaped by institutional culture, leadership, curricular integration of the SDGs, and demographic and academic factors. Although students generally express positive attitudes, a persistent gap remains between intentions and actual sustainable behaviors, due to barriers such as limited resources, weak institutional support and lack of practical opportunities. This study adopts a descriptive approach to identify the factors influencing students' perceptions of sustainability and to propose recommendations to strengthen their engagement. The literature highlights a persistent gap between expressed attitudes and actual behaviors. Although students often express interest in and willingness to engage with sustainability, factors such as institutional barriers, lack of resources, limited information, restricted practical opportunities, and a lack of incentives hinder their ability to translate intentions into concrete actions. Similarly, the perception of institutional support, subjective norms, perceived control, and personal values can either facilitate or restrict pro-environmental behaviors. The objective of this study is to identify and characterize the factors that explain how students perceive sustainability, determining what most influences their attitudes, knowledge, intentions, and behaviors, as well as the barriers and opportunities they recognize. Based on this, the study aims to offer practical recommendations to strengthen student engagement. The study adopts a descriptive approach, suitable for observing and detailing beliefs and behaviors without manipulating variables. This approach will allow for the identification of patterns and relationships that can serve as a basis for future research and for the design of educational strategies aligned with the SDGs.

Keywords: *Sustainability, university student, academic life, motivation, higher education.*

FROM SPHERES OF ACTIVITIES TO LEARNING AND WORK TASKS FOR VET STUDENTS

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Abstract
This paper presents a practical approach for designing work-based learning tasks that connect with actual workplace practices. The research focuses on applied informatics, but the methodology can be adapted to any vocational field. The central question is: how can VET programs bridge the gap between industry needs and educational curricula? Through collaboration with partners in Germany, Spain, Italy, and Serbia, a three-step process emerged: national regulations and job descriptions were analysed to identify spheres of activity; findings were cross-referenced with existing curricula to identify alignments and gaps; and industry experts validated and refined the results through interviews. Building on the Learning and Work Tasks framework by Howe and Knutzen, the identified spheres of activity serve as the foundation for deriving competence-based learning tasks. The paper demonstrates how work tasks, work objects and competences are systematically mapped within each sphere to create authentic learning scenarios that develop both professional and transversal competences.

Keywords: *Vocational education, spheres of activity, work-process learning, competency development, curriculum design.*

DIFFERENCES IN MOTIVATIONAL SELF-REGULATION STRATEGIES ACROSS HIGH-ABILITY, LEARNING DISABILITIES AND REGULAR STUDENTS

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Abstract
Motivational self-regulation strategies (MRSs) play a key role in how students initiate, sustain, and direct effort during learning. Although findings vary across specific strategies, motivational self-regulation is broadly related to students' engagement and academic performance. This study investigates differences in the use of MRSs among 183 Spanish secondary students, comprising regular students, students with learning disabilities, and high-ability students. Group differences were analysed using the Kruskal–Wallis test. The analyses revealed significant group differences in three MRSs. High-ability students reported higher self-enhancing self-talk, suggesting greater use of motivational thoughts oriented toward demonstration of self-worth in terms of normative standards. Students with learning disabilities showed significantly higher work-avoidance self-talk, indicating stronger tendencies to focus on eluding effort. They also scored lower than both comparison groups in enhancement of personal significance, reflecting difficulties in connecting the task with one's own personal interests and preferences. Overall, these findings highlight distinct motivational regulation profiles and underscore the need for differentiated motivational support, particularly for students with learning disabilities.

Keywords: *Adolescence, motivational self-regulation strategies, high ability, learning disabilities, regular students.*

ACTION RESEARCH ON USING GENERATIVE AI TO ENHANCE UNIVERSITY STUDENTS' LEARNING INTEREST AND LEARNING EFFECTIVENESS

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Abstract
This action research focuses on university students enrolled in a required freshman course, "Introduction to Industrial and Organizational Psychology," within the Department of Psychology. The study is motivated by two primary instructional challenges: Students' lack of foundational psychological concepts, which hinders learning effectiveness, and the specific nature of I/O Psychology, which diverges from freshmen's preconceived notions, leading to low learning interest. Therefore, the primary objective is to investigate the efficacy of integrating Generative AI tools with inquiry-based instructional methods to improve these outcomes. Utilizing a one-group pretest-posttest quasi-experimental design within the researcher's own classroom, the study was conducted over one semester. The intervention involved guiding students to use mobile or computer devices to interact with Generative AI software. Through a cycle of in-class AI interaction, homework assignments, and feedback, learners were encouraged to construct professional knowledge through self-directed problem-solving. Post-intervention results revealed that learning effectiveness regarding core I/O Psychology concepts significantly improved. Additionally, information technology application skills showed slight growth. However, contrary to research expectations, both learning interest and teamwork capabilities decreased rather than increased. Based on these findings, the study offers instructional reflections and recommendations for future pedagogical applications.

Keywords: *Generative AI, inquiry-based instruction, problem solving, constructive learning, learning interest.*

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THE INTERPLAY OF TEACHERS' SOFT SKILLS: CREATIVE AND INTERCULTURAL EXPRESSION, CRITICAL THINKING AND EMOTIONAL INTELLIGENCE

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Abstract
Teachers' soft skills are increasingly recognized as key determinants of effective teaching and high-quality educational practice. Creativity, intercultural competence, critical thinking, and emotional intelligence enable teachers to respond to evolving educational contexts, foster inclusion, and build meaningful relationships. However, these competencies are typically examined as discrete constructs, limiting understanding of their interaction and highlighting the need for an integrated, system-oriented perspective. This study is based on a sample of 1800 secondary school teachers in Lithuania. The findings reveal consistent positive relationships among all examined competencies. Emotional intelligence emerges as a central component, strongly associated with both creative expression and critical thinking, while intercultural expression relates to engagement with diverse perspectives. By demonstrating the systemic interdependence of key competencies, the study challenges fragmented approaches to teachers' soft skills and supports a shift toward integrative models of professional competence, in line with the P21 Framework and the OECD Learning Compass 2030.

Keywords: *Teachers' soft skills, creative and intercultural expression, critical thinking, emotional intelligence.*

EDUCATOR ESCAPE ROOMS: PLAY, ASSESSMENT AND SOCIAL EMOTIONAL LEARNING

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Abstract
Teachers are expected to create learning environments that are rigorous, engaging, and student-centered, yet university-based teacher preparation often relies on lecture-based instruction. To prepare teacher candidates (TCs) to teach in more engaging ways, teacher educators must model the kinds of pedagogies they hope candidates will use. This paper examines how playful pedagogy, grounded in the Center for Reaching and Teaching the Whole Child's (CRTWC) framework for social and emotional learning (SEL) and culturally responsive teaching, can deepen course learning while strengthening teacher candidates' social-emotional competencies and excitement about teaching. In our case study, teacher candidates in a foundations of lesson planning course participated in an immersive escape-room-style formative assessment review. As teams solved clues and puzzles, they experienced productive struggle, collaboration, and shared problem-solving, later analyzing how these practices supported engagement, relationships, and SEL development. Using the CRTWC's framework, we explore how playful pedagogies can foster SEL skills, such as self-awareness, relationship building, and collaborative problem solving, while reinforcing rigorous academic content. We also consider how artificial intelligence tools can support teacher educators in designing high-engagement learning experiences more efficiently.

Keywords: *Teacher preparation, engagement, play, social emotional learning.*

SLOVAK VOCATIONAL INSTRUCTORS´ SELF-CONCEPT

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Abstract
This research focuses on instructors (trainers) working in the dual vocational education and training (VET) system in Slovakia. Dual VET is a framework for vocational education and training for a profession that is based strongly on students´ workplace experience. In Slovakia, significant transformations of the vocational education and training started in 2015. Since this year, employees positions in companies can be established following the new legislature. These employees are called "instructors". They have strong positions in companies in transferring work experience to students at a workplace. This research is divided into two studies, employing a mixed-methods research design, integrating both quantitative and qualitative methodologies. In Study I, we posed the following research questions: 1) What distinct profiles of vocational instructors can be identified? and 2) What common characteristics do they share? To answer these questions, semi-structured interviews were conducted with 23 vocational instructors across diverse workplaces in Slovakia. The interviews were audio-recorded and transcribed, and the resulting transcripts were analysed using open and concept coding. The professional typology that emerged from the interviews comprises five distinct vocational instructors' profiles: (a) Visionaries, (b) Networkers, (c) Coordinators, (d) Solitaires, and (e) Ignorants. In Study II, we asked two research questions: 1) Which components of self-concept can be identified in vocational instructors? 2) How these components of professional self-concept interrelate, i.e., to what extent they form a cohesive whole? To analyse instructors' self-concept, a new self-rating questionnaire was developed and validated. The research sample for this study consisted of 386 vocational instructors employed across a range of industries, such as automotive manufacturing and hotel management. The data provided evidence that the instructors' self-concept can be segmented into a four-component model comprising: (a) self-efficacy, (b) task perception, (c) professional development, and (d) perception of corporate values. The relatively high mean scores across all components suggest that self-efficacy, professional development, task perception, and corporate values are robust elements of their vocational self-concept. The differences between the mean scores of these components are minimal, with self-efficacy and professional development receiving the highest rating. Furthermore, the positive and statistically significant correlations among the components indicate that they are interconnected, suggesting that vocational self-concept functions as a holistic personality characteristic for vocational instructors.

Keywords: *Dual VET, instructors, instructor´s professional typology, instructor´s self-concept.*

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PROJECTS AND TRENDS

HANDS-ON PHYSICS: EXPERIMENTAL TEACHING FROM PRIMARY TO TERTIARY EDUCATION

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Abstract
The Erasmus+ project "Lexicon of STEM Educational Films for Primary and Secondary School Students" (Films4Edu) aimed to enhance the quality and reach of distance education in STEM disciplines at the primary and secondary school levels. Implemented across four countries and six partner institutions: University of Silesia in Katowice (Poland), University of Innsbruck (Austria), University of Málaga (Spain), Children's University of Malopolska Foundation (Poland), AGH University of Science and Technology (Poland), and the University of Žilina (Slovakia), the project focused on developing innovative audiovisual teaching resources. This contribution presents selected educational videos produced at the University of Žilina and examines their potential integration into STEM curricula in primary and secondary education. We are currently continuing our work within the new Erasmus+ project "Experiments for Better Teaching in Higher Education" (expEDU). The project aims to foster more interconnected higher education systems by building an international community of science educators who collaboratively share knowledge, resources, experiences, and best practices in physics experimentation. This collaborative framework strengthens the capacity of partner institutions to work more effectively together, ultimately contributing to improved educational outcomes. The main priority of the project is to stimulate innovation in teaching and learning by supporting pedagogical experiments and introducing new approaches to teaching in higher education. During the presentation, we will outline the project's objectives, explore opportunities for further cooperation, and discuss ways to participate in the initiative. In addition to the University of Žilina (UNIZA, Slovakia), the participating institutions include the University of Silesia in Katowice (Poland), VSB – Technical University of Ostrava (Czech Republic), and Ivan Franko National University of Lviv (Ukraine).

Keywords: *STEM education, interactive teaching of physics, educational films, Films4Edu, expEDU.*

WEARABLE-ASSISTED TASK SUPPORT FOR CHILDREN WITH AUTISM SPECTRUM DISORDER IN EDUCATIONAL CONTEXTS

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Abstract
Children diagnosed with Autism Spectrum Disorder (ASD) often experience difficulties maintaining attention and completing daily routines independently. This paper presents a wearable-based support system aimed at enhancing autonomy and task-sequencing skills through two synchronized applications for Apple Watch and iPhone. Developed with Apple native tools, the system features interfaces and pictographic elements. Generative artificial intelligence (AI) assists caregivers and educators in automatically decomposing tasks into personalized, step-by-step routines displayed on the smartwatch. The system was validated through a mixed-method study involving educators and families from local ASD support associations. Evaluation included functional and usability testing across multiple devices, as well as a Likert-based satisfaction survey. Results indicate that wearable visual cues positively influenced children's engagement with everyday tasks, increasing predictability and reducing stress. These findings highlight the potential of accessible wearable technologies to support autonomy and participation in inclusive education, with ongoing work focused on adaptive feedback, customizable visuals, and classroom-oriented analytics.

Keywords: *Inclusive education, wearable technology, task management, assistive applications, ASD.*

EMPOWERING HIGHER EDUCATION LECTURERS THROUGH TEMP: AN INNOVATIVE E-MENTORING MODEL

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Abstract
This qualitative study presents TEMP (Teaching E-Mentoring Process), an institutional e-mentoring framework implemented by a Teaching and Learning Center to support lecturers' pedagogical development in digitally evolving higher education environments. Approximately 300 lecturers participated in the TEMP program, and 75 completed a full open-ended qualitative questionnaire analyzed through thematic analysis. Findings reveal three central themes: development of technical pedagogical competence, implementation of active teaching strategies, and improved course structure. The results demonstrate both immediate pedagogical change and a transfer effect across teaching contexts. TEMP is presented as a scalable, reflective, and sustainable faculty development framework.

Keywords: *E-mentoring, faculty development, reflective practice, higher education, teaching innovation.*

FROM STORY TO STEM: EMPOWERING STUDENTS THROUGH DIGITAL STORYTELLING IN GENDER EQUALITY EDUCATION

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Abstract
This paper presents findings from the piloting phase of the *Digital Stories* set developed within the Erasmus+ project *Digital Bridges Over the Gender Gap* (2024–2026), an international initiative promoting gender equality and inclusion in school education through innovative digital pedagogies. The project's central objective is to bridge gender disparities in career aspirations—especially in STEM fields—by integrating digital storytelling into teaching practice. Digital storytelling was introduced in four European partner schools as both a creative learning method and a tool for social reflection. The *Digital Stories* set features narratives of women who have achieved success in traditionally male-dominated fields such as science, technology, and engineering. The piloting involved teachers and students aged 13–18, who participated in classroom-based and online activities combining digital story creation, viewing, and discussion. To assess the educational and motivational impact, data were collected through semi-structured interviews with teachers and focus group interviews with students. The results indicate that digital storytelling significantly enhanced students' engagement, empathy, and reflection on gender stereotypes. Teachers described the method as an innovative and flexible pedagogical approach that encourages creativity, collaboration, and digital competence development. Students found the stories emotionally compelling and relatable, reporting that they could "see themselves" in the protagonists' experiences. Many expressed a renewed interest in exploring STEM-related studies and careers, attributing their motivation to the immersive and authentic nature of the digital stories. The process of co-creating and interpreting stories also strengthened learners' narrative, media, and communication skills. These findings suggest that digital storytelling can serve as a transformative educational strategy that connects narrative meaning-making with social change. It enables teachers to foster inclusive learning environments and supports students in developing both digital literacy and self-efficacy. The *Digital Bridges* project demonstrates how transnational collaboration can generate sustainable pedagogical innovations addressing gender equality, inclusion, and digital transformation in education.

Keywords: *Digital storytelling, gender equality, STEM motivation, inclusive education, Erasmus+.*

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TRANSFORMING HIGHER EDUCATION: PEDAGOGICAL AND CURRICULAR INNOVATION IN THE CONTEXT OF GREEN AND DIGITAL TRANSITION

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Abstract
Contemporary higher education must rapidly adapt to societal changes driven by sustainability imperatives, the green transition and increasing digitalization. Within this context, the University of Ljubljana launched the ULTRA (University of Ljubljana for Sustainable Society) project to modernize 29 higher education programs by integrating sustainability, green transition and digitalization-related content. The ULTRA project influenced the study programs by introducing new mandatory and/or elective courses, updating existing ones, and/or establishing new short training programs leading to micro-credentials. This study explored how teaching staff, involved in the ULTRA project, experienced these transformations and how they perceive their long-term relevance and applicability. Using a qualitative research design, 25 semi-structured focus group interviews were conducted with 89 participants involved in the implementation of new or redesigned courses, interdisciplinary activities and micro-credential training. The interviews provided an in-depth understanding of participants' views on curricular changes, new equipment, administrative processes, and anticipated developments for the 2024/25 academic year. Data were recorded, transcribed and thematically analyzed. Participants emphasized interdisciplinary collaboration as one of the project's strongest benefits, fostering cooperation between faculties and external partners. They also highlighted the value of newly acquired equipment, which supported more practice-oriented and digitally enhanced teaching. Most expressed satisfaction with new or revised courses and innovative pedagogical approaches, noting improved student engagement. Some, however, pointed out that the rapid introduction of new content and limited promotion reduced student interest, and reported challenges in coordinating interdisciplinary courses. Micro-credentials were seen as a promising way to meet workforce needs, though concerns emerged about their long-term sustainability once project funding ends. Similar worries related to maintaining new subjects, equipment and collaborative practices due to financial and staffing constraints. Despite these issues, the project contributed meaningfully to program development and offered insights for future reforms, with some faculties already transferring renewal elements into university-level programs, though wider implementation would require additional support. Overall, the study shows that the ULTRA project served as an important catalyst for curricular and pedagogical innovation. Participants valued the opportunity to test new approaches and identified concrete steps for further improvements in future, including expanded digital resources, refined course content and enhanced micro-credential offerings. The findings highlight both the transformative potential and the systemic challenges of implementing long-term educational change.

Keywords: *Digital and green transition, curriculum renewal, interdisciplinarity, higher education reform.*

CAN THE DIFFERENT FORMS OF PREJUDICE BLATANT OR SUBTLE, AVERSIVE, REIFICATION, ETC BE APPLIED IN SAUDI ARABIA? ARE THERE ANY OTHER WAYS IN WHICH PREJUDICE IS EXPRESSED, SHOWN IN SAUDI ARABIA

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Abstract
This study examines different forms of prejudice, including blatant, subtle, and aversive racism, and explores how they may be expressed within the Saudi Arabian context. Drawing on social psychological theories, the research analyses how prejudice can appear both explicitly and implicitly across social and institutional settings. The study highlights discrimination toward immigrants, gender-based inequality, and social biases related to cultural and group differences. Findings suggest that while legal and religious frameworks emphasize equality, certain forms of indirect discrimination may still exist in practice. The study contributes to understanding how modern forms of prejudice operate in non-Western societies.

Keywords: *Discrimination, aversive racism, Saudi Arabia, immigrants.*

AN INTERDISCIPLINARY DOCTORAL PROGRAM FOR CREATIVE AND SUSTAINABLE INNOVATION

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Abstract
The doctoral program in Creativity, Social and Sustainable Innovation at the CREA Campus of the University of Vigo represents an innovative and transformative model of doctoral education designed to promote interdisciplinary and transdisciplinary between all the areas of knowledge taught on this campus. Conceived within the framework of contemporary higher education reform, the program responds to the growing demand for flexible, integrative, and socially engaged doctoral training capable of addressing complex global challenges. At its core, the program emphasizes the importance of aligning doctoral projects with two distinct research lines from different fields or disciplines. The program operates as a dynamic learning ecosystem and a hub for academic collaboration, supported by the School of Forestry Engineering and several faculties on the Pontevedra campus, including Fine Arts; Education and Sports Sciences; Physiotherapy; Social Sciences, Communication and Design; and Direction and Public Management. This interdisciplinary academic promotes collaborative learning, cross-faculty teaching practices, and the co-creation of knowledge among doctoral students and faculty members from diverse educational and professional backgrounds. At least two experts who bring their specialized knowledge to enrich the doctoral work guide these projects. This structure encourages collaboration across traditionally separate domains, enabling innovative approaches to complex societal challenges. Furthermore, students benefit from a dynamic academic environment that integrates diverse methodologies and perspectives, enhancing both the depth and impact of their research.

Keywords: *Interdisciplinary doctoral education, transdisciplinary, innovative research training, creativity and social innovation, higher education pedagogy.*

GAMIFICATION AND VISUAL MODELS AS TOOLS TO SUPPORT UNDERSTANDING OF ATOMIC STRUCTURE AMONG SECONDARY SCHOOLS STUDENTS

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Abstract
Atomic structure is one of the most abstract and challenging topics in chemistry education. Students often struggle to visualize submicroscopic structures and to grasp atomic models and the concept of orbitals. Traditional lecture-based methods frequently prove insufficient, leading to decreased motivation and the reinforcement of misconceptions. The aim of this project was to develop and evaluate the effectiveness of alternative teaching methods for atomic structure, based on gamification and analogical models. It is assumed that incorporating elements of play and narrative (e.g., the periodic table as a game board, orbitals as airplane flight paths) enhances students' understanding, engagement, and long-term retention of knowledge. The study involved a group of secondary school students divided into an experimental group (taught using games and analogies) and a control group (taught using traditional methods). The effectiveness of the methods was assessed through a knowledge test, a questionnaire on perceived difficulty, and observation of student activity during lessons. Additionally, interviews with students and teachers were conducted to evaluate the attractiveness and educational potential of the developed models. The findings indicate that the use of gamification and analogical thinking significantly improved students' comprehension of abstract concepts and increased their motivation to learn chemistry. The results may serve as a basis for developing a set of innovative teaching tools and lesson plans that foster scientific competencies through play, experience, and imagination.

Keywords: *Gamification, analogical models, analogical thinking, alternative teaching methods in chemistry.*

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ELECTRONIC TESTING AS A MOTIVATIONAL TOOL IN PRE-SERVICE TEACHER EDUCATION: A PILOT STUDY

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Abstract
Electronic testing has become an increasingly common component of higher education; however, its influence on the motivation and study strategies of pre-service teachers remains insufficiently explored. Attention should be paid to how students perceive e-tests during their preparation for credit assessments and whether this form of assessment supports learning processes, self-assessment, and regular study habits. This paper presents a pilot research study based on a questionnaire survey conducted among pre-service mathematics teachers in the Czech Republic and Slovakia. The study examines how students engage with electronic tests throughout the semester, to what extent they perceive them as a motivating factor, and which specific aspects of e-testing facilitate or hinder their study preparation. A comparative perspective is included to capture potential differences between the Czech and Slovak educational contexts. Initial pilot findings indicate recurring patterns in students' perceptions of electronic testing, particularly regarding the role of immediate feedback and opportunities for repeated practice. These factors appear to contribute to continuous study engagement and support learning-oriented use of assessment tools. The pilot study identifies key variables influencing the acceptance of electronic testing among future teachers and establishes a foundation for a broader follow-up investigation. The findings contribute to discussions on the effective integration of electronic testing into university teacher education and provide recommendations for the innovation of current assessment practices.

Keywords: *Electronic testing, student motivation, pre-service teachers, formative assessment, digital learning tools.*

DEVELOPING EMOTIONAL INTELLIGENCE TO FOSTER SUSTAINABLE CONSUMPTION: AN INTEGRATED APPROACH TO FUTURE EDUCATOR TRAINING

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Abstract
The growing complexity of sustainability challenges calls for higher education approaches that integrate cognitive, emotional, and ethical dimensions of learning. This Italian pilot case study investigates how an emotionally engaging, collaborative Design Thinking (DT) intervention can foster sustainability awareness and value-based orientations among undergraduate students. The intervention was implemented during the 2024/2025 Design Thinking course at LUMSA University (Rome). A mixed-method, quasi-experimental case study design was adopted. Qualitative data were collected through an in-class post-it activity, while quantitative analyses focused on matched pre–post questionnaires. Findings reveal multidimensional sustainability conceptualizations, ethically driven SDG engagement, and meaningful associations between pro-environmental behaviors, reduced psychological conflict, emotional variables, and well-being indicators, while short-term behavioral change remains limited.

Keywords: *Education for sustainable development, design thinking, emotional engagement, SDGs, higher education.*

INTEGRATING AI TOOLS IN UX AND SOFTWARE EDUCATION: INSIGHTS FROM TEACHING PRACTICE

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Abstract
Artificial intelligence (AI) is increasingly influencing software engineering education. This paper reports experiences from integrating an AI-supported learning environment based on Google NotebookLM into a usability testing course in the master's program Software Engineering at the University of Applied Sciences Technikum Wien. Students used curated materials and structured question sets during self-study and applied usability and accessibility testing methods in practical exercises. Assessment was conducted through face-to-face examinations. Results show a high level of methodological correctness in the student work. Of 47 assessed students, 78.7% received the highest grade and the pass rate was 97.9%. Course evaluations were also very positive. The experience suggests that AI-supported learning environments can effectively support structured preparation and learning outcomes when combined with clear assignments and controlled assessment formats.

Keywords: *AI in software engineering education, usability testing, AI-supported learning.*

RETHINKING ONLINE DOCTORAL EDUCATION: DIGITAL INNOVATION, E-LEARNING AND AI IN THE CREA PROGRAM

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Abstract
The PhD Program in Creativity and Social and Sustainable Innovation (CREA) at the University of Vigo in Spain, seeks to strengthen the University's contribution to priority research areas and global societal challenges through an innovative, transversal and creative educational approach. The program addresses key domains such as health, environment, communication, education and culture, and governance, with a particular focus on responding to emerging developments within the digital society. CREA is delivered entirely online, aiming to attract international talent and provide flexible access to advanced doctoral training aligned with contemporary educational transformations. This paper presents the design, implementation and continuous evolution of the program's e-learning methodology, highlighting its alignment with recent developments in digital education. The CREA doctoral program is supported by a fully virtual learning ecosystem developed by the University of Vigo, which includes a remote campus for synchronous online teaching and asynchronous access to recorded sessions, a digital platform for the management and organization of course content, and a comprehensive online system for academic and administrative monitoring through a virtual doctoral office. These digital infrastructures enable effective interaction, supervision and assessment in a fully online doctoral environment.

Keywords: *Doctoral program, digital innovation, e-learning, artificial intelligence, online education.*

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EVALUATING THE IMPACT OF PILOT CURRICULUM UPDATES ON SUSTAINABILITY, CLIMATE, ENERGY AND BIODIVERSITY LITERACY AMONG TEACHER-EDUCATION STUDENTS

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Abstract
Despite growing international emphasis on sustainability, climate change and digital transformation, research shows that teacher-education programmes often insufficiently integrate competencies for sustainable development. Yet future educators are expected to cultivate critical and systems thinking, ecological literacy and responsible action in their learners, which requires these competencies to be embedded in initial teacher education. Several nternational frameworks highlight the key role of educators in preparing new generations for complex socio-ecological challenges. The project "*Modernisation of Teacher Education Study Programmes – PŠP NOO*", implemented by the University of Ljubljana, the University of Maribor and the University of Primorska, addresses this gap by updating teacher-education curricula. Its central focus is strengthening sustainability competencies through curriculum renewal, pilot implementation and evaluation. The research examines whether these pilot updates lead to measurable progress in students' knowledge, attitudes and behaviours related to sustainability, climate literacy, energy literacy and biodiversity conservation. A mixed-methods design was adopted, although the primary focus of this report concerns the quantitative component. A total of 1,092 students of teacher-education programmes participated in the baseline measurement, while 305 students completed the final measurement. Participation was voluntary; reduced participation at the end of the academic year is attributed to examination obligations. A structured questionnaire was administered to students enrolled in courses undergoing pilot updates in the 2024/25 academic year at all three universities. The questionnaire assessed four domains: (1) Sustainability Competence, (2) Climate Literacy, (3) Energy Literacy and (4) Biodiversity Conservation. Items targeted knowledge, attitudes and behavioural dimensions. The questionnaire was disseminated at the start and end of the academic year to allow comparison of students' competence levels before and after the implementation of the pilot curriculum updates. Quantitative findings indicate substantial improvements in students' knowledge across all four thematic domains. Sustainability Competence showed improvements in 100% of items; Energy Literacy improved in 92% of items; Biodiversity Conservation in 75%; and Climate Literacy in 65%, with 25% showing lower scores at final measurement. Attitudinal results revealed overall stability, suggesting that students already held well-established attitudes regarding environmental protection and social responsibility. Behavioural indicators also showed minimal variation between the two measurements, indicating stable, established habits. Overall, 83% of all questionnaire items showed improvement. Items with negative change (6%) may reflect increased awareness, measurement fatigue or more critical self-assessment at year-end. The evaluation demonstrates that the curriculum updates successfully enhanced students' sustainability-related knowledge and contributed to a positive shift in competencies. The findings support continued implementation and scaling of curriculum modernisation within the project, reinforcing the importance of equipping future educators with competencies essential for sustainable societal transformation.

Keywords: *Sustainability competencies, teacher education, curriculum modernization, climate and energy literacy, biodiversity literacy.*

IMPLEMENTING RESEARCH-BASED LEARNING TO ENHANCE COMPETENCIES IN INDUSTRIAL BIOTECHNOLOGY EDUCATION FOR CHEMICAL ENGINEERING STUDENTS

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Abstract
This project introduces a Research-Based Learning (RBL) approach in the Industrial Biotechnology course at the University of Jaén to enhance practical and research skills in Chemical Engineering students. Through hands-on, team-based projects using advanced lab equipment, students engage in authentic biotechnological challenges, fostering critical thinking, collaboration, and autonomy. Preliminary results show increased motivation, improved academic outcomes, and strengthened professional competencies. The model is designed to be scalable and transferable to other technical courses, with dissemination planned via publications and open educational resources.

Keywords: *Research-based learning, industrial biotechnology, engineering education, research competencies, active learning.*

EDUCATIONAL PROGRAM FOR TEACHING READING AND WRITING: ITEM CONSTRUCTION AND AGREEMENT AMONG JUDGES

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Abstract
Introduction: The number of students with literacy problems is growing in the Brazilian educational context, and one possible explanation for this exponential growth is the lack of literacy methods that emphasize teaching the alphabetic principle. *Aims:* describe the development of the Alfassilabando Educational Program to students from 1st, 2nd and 3rd grades of Elementary School and present the preliminar findings of validity. *Materials and methods:* This research was developed in two phases. Phase 1 focused on elaboration of items and criteria and Phase 2 focused validation by judgment of specialists. *Results:* The development of items and criteria for the Alfassilabando Educational Program for students with learning disabilities in grades 1-3 of Elementary School was possible through a review of national and international literature, which enabled the development of a program composed of five modules, with 18 activities distributed across four sessions. Content validation of the Alfassilabando Educational Program revealed moderate to poor agreement that only a pilot study could help in readjusting the instructions and the stimuli number in the program's activities. *Conclusion:* The Alfassilabando Educational Program can contribute to the development of reading and writing skills for students with learning disabilities of Elementary School.

Keywords: *Learning, syllabic approach, learning difficulties, literacy.*

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ROLLING DICE, BUILDING FUTURES: USING BOARD GAME TO ENHANCE CAREER PLANNING

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Abstract
Higher education institutions face increasing challenges in preparing students for complex and uncertain labour markets. Although career development learning is widely promoted in higher education policy, it often remains weakly embedded in university curricula, particularly in theory-driven programmes. As a result, many students experience difficulties in applying academic knowledge to real-life career planning, financial decision-making, and work-related problem-solving. This study presents an innovative analogue board game, Study Hard, Work Hard!, designed to support career development learning through experiential and playful pedagogy in higher education. The game simulates realistic student life situations such as budgeting, student employment, scholarship opportunities, job interviews, and time management dilemmas. It aims to develop employability-related competences including decision-making, collaboration, communication, reflection, and financial awareness. The board game was implemented within a university course focusing on career preparation at a Hungarian higher education institution. A total of 60 undergraduate students from diverse disciplinary backgrounds participated in a facilitated gameplay session. Data was collected using a structured post-intervention questionnaire measuring motivation, engagement, collaboration, perceived learning outcomes, and the realism of the scenarios, complemented by open-ended reflections. Findings indicate that students perceived the board game as highly engaging and educationally valuable. Participants reported increased awareness of career-related choices, financial challenges, and the complexity of balancing work and study. The most positively evaluated aspects were the realism of the situations, opportunities for reflection, and the development of employability-related skills in a supportive learning environment. The results suggest that board game-based pedagogy offers a practical and adaptable approach for integrating career development learning into higher education curricula while enhancing student engagement.

Keywords: *Career development learning, employability, board games, pedagogical innovation, higher education.*

FLIPPED WEBINARS FOR ONLINE PSYCHOLOGY STUDENTS: IS ATTENDANCE AN APPROPRIATE QUALITY INDICATOR?

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Abstract
Interaction and collaboration support student satisfaction and learning in online education, yet participation in synchronous activities can be challenging for online students due to work and family obligations. An experimental development project was conducted, in which a flexible, voluntary flipped webinar series was implemented for online psychology students over three terms. The aim was to support student motivation through active and collaborative learning. This paper reports findings from one component of the data collection, namely a student evaluation (n = 47, response rate: 26%) including both quantitative and qualitative data. Results revealed high perceived learning and moderate perceived social benefit. However, attendance remained low across the terms, at levels comparable to other voluntary synchronous webinar series. Low attendance raises questions about how the effects of flexible, synchronous teaching interventions should be interpreted, and this paper examines the role of attendance as a quality indicator in online education. Self-determination theory (SDT) was used as a conceptual framework for the pedagogical design of the flipped webinar series. Three single-item statements were adapted, translated, and contextually adjusted from an established SDT instrument to serve as exploratory indicators of need satisfaction. Results indicate that the needs for autonomy and competence were generally supported. Attendance was associated with lower perceived autonomy and higher perceived relatedness. The findings suggest that perceived need satisfaction may function as a supplementary quality indicator.

Keywords: *Flipped classroom, higher education, online learning, quality measures, self-determination theory.*

DIGITAL TOOL USE AND MATHEMATICS PERFORMANCE: EVIDENCE FROM PISA 2022

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Abstract
This study investigates the impact of students' digital background factors on mathematical achievement using data from the 2022 PISA assessment. The analysis focuses on 15-year-old students from Austria, Estonia, and Hungary with particular attention given to the interplay between home financial conditions, ICT availability and usage, digital attitudes, and mathematics performance. Drawing on student questionnaire responses, we constructed composite indices and factor scores representing digital access, usage frequency, and digital competence at both home and school settings. Descriptive statistics, ANOVA, and linear regression models were applied to explore the relationships between digital background variables and students' mathematics proficiency scores. The results reveal that home financial status consistently predicts higher achievement across all three countries, whereas the frequency of school-based ICT use shows a negative correlation with performance. Conversely, home-based ICT usage and positive attitudes towards online platforms correlate with higher mathematics outcomes. The Estonian data challenge the initial hypothesis of a country-specific positive effect of ICT usage in schools, suggesting instead that the quality and context of digital integration matter more than frequency. The findings also highlight the importance of learning orientation and student motivation in shaping mathematics performance. Despite some methodological limitations – such as the cross-sectional nature of the data and reliance on self-reported measures – the study offers reliable insights into how digital background factors influence academic outcomes. The results underscore the need for more effective integration of ICT tools in classrooms, informed by students' learning habits and preferences.

Keywords: *Digital background, mathematics achievement, PISA 2022, ICT usage.*

CHATGPT AS A LANGUAGE TRAINER FOR ENHANCING THE INTERACTION SKILLS OF GERMAN LEARNERS IN JAPAN

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Abstract
This study explores the usefulness of ChatGPT for improving L2 German learners' communicative skills and for raising awareness of the evolving literacy demands associated with AI use. Participants were B1-level students at a Japanese university who completed six communicative tasks with ChatGPT based on scenarios from their textbook, including a shopping conversation, a private dinner invitation, and a job interview. The tasks were designed to allow learners to apply expressions introduced in the textbook. To support task completion, students received step-by-step instructions as well as prompts specifying the situation and for resolving linguistic difficulties and obtaining feedback on their output. The tasks were completed as homework. Data consisted of transcripts of student–ChatGPT interactions and a post-task survey including Likert-scale and open-ended items. Quantitative data were analysed descriptively, and qualitative content analysis was applied to open-ended responses. The study addressed three research questions: what difficulties students encounter when completing communicative ChatGPT tasks as homework, how useful they perceive such tasks for learning German, and how the tasks could be improved to complement textbook-based instruction. Results indicate that students generally enjoyed using AI and valued the opportunity to practice interactions and review information at their own pace. They perceived the tasks as helpful for receiving feedback, improving reading and writing skills, and reinforcing vocabulary and grammar. However, the study also revealed misunderstandings and uncertainty about the accuracy of AI-generated information. These findings highlight the importance of providing learners with adequate linguistic and technical support when integrating AI into homework assignments.

Keywords: *Artificial Intelligence, German, computer mediated communication, task-based learning.*

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ASSESSMENT OF TEACHERS' KNOWLEDGE, ATTITUDES AND REPORTED BEHAVIORS RELATED TO CLIMATE CHANGE AND ADAPTATION

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Abstract
Humanity today faces a triple crisis driven by climate change, pollution, and biodiversity loss. Educational research has shown that teachers usually have positive attitudes toward climate change education, but their knowledge is only moderate, especially for adaptation topics. With the ongoing renewal of primary and secondary school curricula in Slovenia, there is a unique opportunity to introduce these topics and link them to sustainability, which is one of the reform's main goals. The present study deals with the integration of climate change and adaptation topics into school practice as part of the recently launched seven-year LIFE4ADAPT project in Slovenia. Our first steps investigated the integration of climate change and adaptation topics into the current and renewed school curricula, followed by an assessment of teachers' knowledge, attitudes, and reported behaviours related to these issues. A total of 579 primary and secondary school teachers participated in an online survey, the link to which was sent to all the schools in Slovenia. The questionnaire consisted of six thematic sections covering (1) self-perceived knowledge, (2) reported behaviors, (3) attitudes, (4) behavioral intent, (5) actual knowledge, and (6) socio-demographic data (i.e. school type, gender, place of residence, number of household members, net monthly household income, transport to work). Findings show that knowledge is the strongest and most consistent predictor across dimensions: it significantly influences attitudes, reported behaviors, behavioral intent, and the reduction of misconceptions. These results will serve as a baseline for preparing educational activities. The implications of these findings will be discussed.

Keywords: *Teachers, attitudes, knowledge, climate change, adaptation.*

EVOLVE2CARE TRAINING SERIES: BUILDING CAPACITY FOR INNOVATORS AND LIVING LABS

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Abstract
The Evolve2Care Training Program Series was created to address a critical challenge: many promising ideas and technologies emerge in research settings, yet few reach real-world use. Transforming concepts into concrete solutions requires coordinated work among researchers, entrepreneurs, companies, investors, and support organisations. These interactions are often fragmented, slowing the transition from experimentation to implementation. To bridge this gap, Evolve2Care provides two coordinated six-part training programs: the Training for Innovators and the Training for Living Labs.

Keywords: *Training program, living labs, rapid prototyping, healthtech innovation, user-centred design.*

TEACHING AND LEARNING

THE PERCEPTION OF PLANTS BY ELEMENTARY SCHOOL PUPILS: PRELIMINARY RESULTS

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Abstract
Plants are frequently overlooked by people compared to animals. The study investigated primary school pupils' attitudes toward plants in a sample of 159 pupils aged 9–13 years, which is a common age range for research on environmental and plant-related attitudes in primary education. The sample size is typical for a school-based survey study in environmental and biological education, allowing for reasonable statistical power in descriptive, inferential and multidimensional analyses. Data were collected using a 38-item questionnaire with a Likert-type scale (5-point scale from "strongly disagree" to "strongly agree"), a standard method for measuring attitudes in educational research. The questionnaire was divided into 6 factors following: 1. Importance of plants (9 items); 2. Interest to plants (10 items); 3. Necessity of plants (3 items); 4. Positive effect (4 items; 5. Animals and plants (4 items); 6. General attention (4 items); 7. Caring for or investment in plants (3 items). The influence of gender, grade level, ownership of garden and growing houseplants was examined. For the determination of psychometric characteristics of the research tool was the statistical methods like Cronbach's alpha and exploratory factor analysis used. The perception of plants was slightly positive. Gender and grade level were significant factors. On the other hand, ownership of garden and growing houseplants were insignificant.

Keywords: *Elementary school pupils, Likert type items, perception of plants, quantitative approach.*

AN ESTONIAN (L2) ONLINE COURSE FOR UNIVERSITY APPLICANTS: RATIONALE AND METHODOLOGICAL FRAMEWORK

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Abstract
The rationale for establishing the course for university applicants in Estonian as a second language lies in the Estonia's ethnolinguistic composition and the particularities of its education system. Around 10% of new entrants to the University of Tartu come from upper secondary schools with Estonian-Russian bilingual instruction, having studied Estonian as a second language. This background does not always provide sufficient proficiency to manage university studies, where the curricula are delivered in Estonian. Successful participation in academic communication requires exposure to input across a range of registers. The e-course is designed to help secondary school graduates strengthen their Estonian language competence for academic purposes. The C1-level course is organised around the University of Tartu's four disciplinary domains (Social Sciences; Arts and Humanities; Medicine; Science and Technology). The modules are discipline-specific, with thematic content supported by authentic materials. Instruction takes place via Moodle. The course has been offered in 2024 and 2025 (3 ECTS; with 205 and 165 participants, respectively). The paper aims to outline the rationale and methodological principles of course design, as well as to evaluate initial experiences and identify areas for further development, drawing on feedback from both students and teachers. The course serves as an applied model for facilitating the transition from secondary to higher education for students whose mother tongue differs from the university's language of instruction. The model is also adaptable in other countries where a gap exists between the language of instruction and students' first language.

Keywords: *e-learning, CALL, course design, Estonian as a second language.*

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BEYOND THE NUMBERS: GENDER REPRESENTATION IN GERMAN MATHEMATICS BOOKS

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Abstract
Textbooks, as socially recognized and officially authorized media, serve as key tools for conveying subject-specific knowledge and shaping students' identities and future aspirations. Multiple national and international studies have consistently shown an underrepresentation of female characters and the reinforcement of gender stereotypes across various academic subjects. Recent analyses confirm that these issues persist in German mathematics textbooks. This study aims to fill a current research gap by examining the influence of the 2016 resolution by the Conference of Ministers of Education and Cultural Affairs (KMK), which called for the removal of gender-stereotypical content in mathematics education. We conducted both quantitative and qualitative content analyses of 19 mathematics textbooks used in secondary schools several federal states. The quantitative findings revealed a notable underrepresentation of female characters, especially among adult figures and within descriptive texts. Although the use of masculine generics tended to amplify these disparities, it was not the primary cause. The qualitative analysis uncovered stereotypical role distributions in areas such as famous personalities, employment, family, household, and sports. Conversely, representations of mathematical activity and competence were generally balanced. Overall, the study observed that adult women and men primarily reinforced traditional gender roles, whereas girls and boys increasingly appeared as equal peers. These results are discussed in relation to existing research, leading to practical implications for classroom teaching, textbook development, and future studies. For instance, teachers are encouraged to explicitly problematize biased content through class discussions and publishers should take proactive steps by reviewing their content through the lens of social responsibility.

Keywords: *Gender representation, mathematics textbooks, gender stereotypes.*

ENHANCING VOCABULARY RETENTION IN CIVIL ENGINEERING ENGLISH USING CONTEXT-BASED QUIZZES

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Abstract
This article examines the use of technical vocabulary quizzes embedded in contextual sentences to enhance English vocabulary acquisition among civil engineering students. Mastery of specialized terminology is crucial for effective communication in engineering education; however, students often struggle when learning terms in isolation. By integrating vocabulary into meaningful, discipline-specific contexts through quizzes, this approach promotes deeper comprehension, critical thinking, and long-term retention. The study presents some quiz formats and how context-based vocabulary instruction bridges language acquisition theory and effective educational practice. Findings reveal significant improvements in vocabulary retention, critical thinking skills, and student engagement, confirming the effectiveness of contextualized vocabulary learning in technical and higher education settings. Furthermore, the approach fosters learner autonomy by encouraging students to actively engage with the vocabulary in authentic contexts. This method also supports the transfer of language skills to professional environments, preparing students for real-world engineering communication challenges. Finally, feedback from students indicates increased motivation and confidence when interacting with specialized vocabulary in context.

Keywords: *Civil engineering education, technical vocabulary, context-based learning, vocabulary retention.*

COMPUTATIONAL THINKING AND GAMIFIED LEARNING TOOLS: CONSTRUCTING A RESEARCH DESIGN IN THE CONTEXT OF PRIMARY MATHEMATICS EDUCATION

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Abstract
In the contemporary paradigm of educational research, the ecological validity of empirical studies is becoming increasingly important - research must reflect authentic learning conditions and allow reliable assessment of learning effects in real classrooms. The integration of computational thinking and game-based, analytics-driven learning tools into primary education creates a need for an interdisciplinary research design that combines technological and pedagogical perspectives. The aim of this study is to construct a methodologically and ethically grounded research design that enables the evaluation of the impact of computational thinking and game-based tools on primary school students' mathematical abilities. The design is based on the principles of design-based research (DBR) and learning analytics-informed design, combining empirical rigor with ecological authenticity. DBR ensures the practical relevance of interventions, while learning analytics allows real-time monitoring of their implementation. The study follows the principles of human-centred learning analytics, ensuring pedagogically and ethically meaningful interpretation of data. Analytics is used not only to measure student engagement but also to model learning trajectories The research design applies a mixed-methods approach and a randomized controlled trial (RCT) involving 600 students and 30 teachers. By triangulating perspectives from education, computer science, and cognitive sciences, the study seeks to reveal how the interaction between computational thinking and game-based elements shapes mathematical reasoning. The model supports evidence-based evaluation of learning innovations in authentic educational settings, strengthening the link between theory and practice. By combining empirical precision with pedagogical relevance, this study contributes to the development of an evidence-informed and sustainable design for educational research.

Keywords: *Gamified learning, computational thinking, primary education, mathematics education, human-centred learning*.

SUPPORT FOR LANGUAGE SKILLS OF STUDENTS IN PHYSICAL EDUCATION TEACHING

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Abstract
In Quebec, the *Reference Framework for Professional Competencies* (MEQ, 2020) prescribes language proficiency as one of thirteen competencies to be developed during university education. Therefore, passing the "Test de Certification en Français Écrit pour l'Enseignement" (TECFÉE) is required during training. The TECFÉE consists of two parts: 1) linguistic code and 2) writing of a critical report. However, grammar and writing remain challenges for students (Boivin and Roussel, 2022), resulting in a low pass rate for the Test (Dion-Viens, 2024). In this context, our support project includes theoretical and practical workshops, exercises, and formative assessments related to the two parts of the TECFÉE. This project has been in place during four years for physical education students (n=~55/cohort/year). An evaluative research design, inspired by Kirkpatrick and Kirkpatrick (2006), was used to measure the effect of this support project on the results of an online questionnaire for students, and of two formative assessments specific to writing during an academic year. In terms of student assessment based on questionnaire, the results highlight greater motivation to prepare for the TECFÉE and a better perception of language skills. The results indicate higher scores on the second writing critical report test ($t [55] = 4.025$, $p<0.001$). As part of this presentation on the topic of "Teaching and Learning/Higher Education," the potential for transferring such a support project to higher education will be discussed.

Keywords: *Writing skills, support project, higher education, physical health education*.

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EMOTION BEHIND THE MASK: A NEUROHUMANITIES EDUCATIONAL APPROACH TO JAPANESE NOH THEATER

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Abstract
Neurohumanities refer to the field that studies how cultural artifacts shape human neural perception. In this theoretical proposal, we map out in a lesson plan how Japanese Noh Theater masks connect to embodied cognition and affect. The scope of this educational intervention is to consider the impact of the introduction of neurohumanities on interdisciplinary thinking in undergraduate education. Through a series of learning activities, students will be able to interact with historical objects and identify their neural signature in the living human brain (namely, brain structures involved in processing Noh theater masks), as well as their literary imprint, thereby gaining an understanding of the relationship between neuroscience and culture. The teaching intervention is aimed at higher education; to be held on the World Theater Day (27th of March) and is intended for university students in the sciences and the humanities. This is a three-fold intervention: first, students will be introduced to the field of neurohumanities and its implications to neuroscience and cultural forms literacies. Second, a Noh Theater mask workshop will take place, drawing on digital and analog artifacts. Lastly, in the context of theory and criticism of literature, the interplay of reading, storytelling, creativity, empathy and memory are explored. Assessment will take place via a content knowledge challenge and an evaluation report focusing on student experience. This educational approach promotes interdisciplinary thinking, neuroscience literacy, intercultural understanding and cognitive empathy.

Keywords: *Neurohumanities, neuroscience, Noh theater masks, theory and criticism of literature, higher education.*

SHAPING CRITICAL THINKERS: HOW PERSONALITY TRAITS INFLUENCE PRE-SERVICE TEACHERS' REASONING ON SOCIAL MEDIA

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Abstract
Social media has become a primary environment where individuals encounter diverse perspectives, misinformation, and emotionally charged narratives. For future teachers, the ability to critically assess online information is particularly significant, as their professional role requires both self-reflection and the ability to guide others. This study explores the relationship between pre-service teachers' personality traits and their application of critical thinking in social media contexts. A quantitative research design was employed, combining the Big Five personality dimensions scale with an assessment of critical thinking skills. The sample consisted of 218 pre-service teachers who completed a structured online questionnaire. Planned activities included the evaluation of self-perceived critical thinking competences, focusing on three groups of skills: (a) critical analysis and information evaluation, (b) assessment of information reliability and reasoning, and (c) coherence and information validity. Results indicate that higher levels of extraversion and conscientiousness are associated with more positive self-assessments of critical thinking abilities, particularly in analyzing arguments and identifying logical inconsistencies. Neuroticism showed a tendency to enhance awareness of potential flaws in reasoning, while openness and agreeableness were linked to reflective judgment and sensitivity to multiple viewpoints. However, certain abilities, such as questioning assumptions or challenging flawed arguments, were reported as weaker areas. These findings highlight the importance of systematically fostering critical thinking skills in teacher education, with particular attention to personality-driven differences in how future educators perceive, evaluate, and act upon information within digital spaces.

Keywords: *Pre-service teachers, personality traits, critical thinking, social media.*

ARTIFICIAL INTELLIGENCE IN THE EVERYDAY LIFE OF YOUNGER SCHOOL-AGE CHILDREN

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Abstract
The integration of artificial intelligence (AI) into everyday life is rapidly increasing and affects all age groups, including younger school-age children. This paper reports findings from the first, quantitative phase of a broader multi-phase mixed-methods study focused on how children at the end of middle childhood understand AI and what experiences shape their attitudes toward it. The quantitative phase was conducted in the Czech Republic in May 2024 with N = 2,209 fifth-grade primary school pupils. The questionnaire examined pupils' awareness of AI, sources of information, associations and mental models, ideas about current uses of AI, perceptions of error-proneness, and risk perceptions. The results show a high level of self-reported awareness of AI (88.8%) and identify the online environment as the main source of information (internet/web: 62.9%), while school appears more often as a secondary source (39.5%). AI is also widely perceived as a potentially risky technology (76.3%), although pupils' justifications are often vague (35.6%). Although 55.7% of pupils reported that they "have an idea of how AI works," open-ended responses revealed many indeterminate answers lacking any mechanism (40.1%) and a predominance of functional or artifact-based conceptions, such as "I give a task → AI responds" or AI as a robot/machine. The findings highlight the need for instruction that distinguishes everyday experience with AI tools from understanding their underlying principles and builds on children's lived digital experiences.

Keywords: *Artificial Intelligence, younger school-age children, educational technology, cognitive development, AI ethics in education.*

EXPERIENCE WITH EVALUATION OF THE ISOSTERIC ADSORPTION HEATS BY STUDENTS USING CLAUSIUS-CLAPEYRON APPROACH

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Abstract
This study analyses the approaches and problem-solving strategies employed by students in calculating the isosteric heat of adsorption *Qst* for carbon dioxide on coal, utilizing adsorption isotherms and employing the Clausius-Clapeyron approach. Student problem-solving approaches play a critical role in mastering complex topics in physical chemistry, including adsorption processes. Research has shown that student strategies often vary based on their prior knowledge, instructional guidance, and available resources. To better understand these dynamics, this study analyzes the methodologies employed by students in their calculation of isosteric heats and evaluates how these methods reflect their problem-solving preferences. To classify the problem-solving strategies employed by students, their methods were categorized into four groups: a) extracting pressures from original adsorption data; b) deducing pressures from the graphical representation of isotherms; c) calculating pressures through linear regression of isotherms; and d) calculating pressures using a second-order polynomial regression of isotherms. Moreover, the Freundlich adsorption model was evaluated for its potential to approximate isotherm trends. All methods yielded similar isosteric heats (approximately 31 kJ mol^{-1}) for adsorption uptakes (v_a) greater than 2.5 ml g^{-1}, yet significant disparities in *Qst* were observed at lower surface coverages. When determining the most suitable fit for the adsorption data, analysis of the residues is recommended rather than comparison of the values of the coefficient of determination, R^2. The second-order polynomial fit, specifically in the coordinates v_a versus ln(p), demonstrated the tightest course with the experimental adsorption data across the entire range of adsorption and can thus be recommended as the appropriate numerical approximation of the isotherm trends. The classification was based on the students' submitted calculations and their explanations during follow-up discussions. Each approach was further analyzed for its replicability and accuracy. The observed variability in the students' results underscores the importance of providing clear guidelines for data analysis in chemistry education. By engaging in these tasks, students developed critical thinking skills and an appreciation for the impact of methodological choices on scientific outcomes.

Keywords: *Higher education, physical chemistry, problem-solving, adsorption, critical thinking.*

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TEACHING AND LEARNING STRATEGIES AND METHODS IN INFORMATICS EDUCATION

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Abstract
Digitization is fundamentally transforming educational processes, offering new opportunities for learning and teaching at different levels of the education system. Additionally, these processes facilitate the creation of diverse learning environments, resources, and learning possibilities in different ways. Teaching and learning in informatics education also face new challenges. Questions arise not only about what we should teach the new generation growing up in the digital age, but also how we should teach them. This report aims to reveal how informatics is taught and learned in primary and secondary education, as well as the teaching and learning strategies and methods employed in informatics education. The object of the study is the methods of teaching and learning strategies in informatics. The data were collected through an anonymous online questionnaire that covered teacher agency, including both instrumental actions (reflected in teachers' applied teaching and learning methods) and personal factors. The results of a quantitative study conducted in 10 EU countries (N = 979) reveal that teaching is typically based on Teacher-centred strategies as well as teaching and learning methods, where the teacher plays the primary role as the source of knowledge, and students are seen as passive participants in informatics education. The most commonly used methods are demonstration, direct instruction, repetition, and explanation, which facilitate the systematic transfer of knowledge. Although teacher-centred methods dominate, we can observe a growing importance of practical interaction-based methods that could help students prepare for real-life situations. Results also indicate a greater emphasis on creativity and social communication in primary education.

Keywords: *Teaching and learning strategies, teaching and learning methods, informatics education, teacher-centred approach, primary and secondary education.*

A DIDACTIC APPROACH TO BACK-END DATA VALIDATION IN WEB APPLICATION DEVELOPMENT

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Abstract
Data validation is a fundamental aspect of web application development, directly impacting data integrity, security, and system reliability. In the education of information technology professionals, understanding validation strategies across both front-end and back-end layers is essential for building robust and scalable applications. This article presents a didactic approach based on a structured lesson focused on data validation, combining theoretical foundations with practical implementation. Initially, the concepts of data validation in front-end and back-end environments are discussed, highlighting their roles, differences, and complementary nature within the application architecture. Subsequently, the study explores back-end validation through two approaches: manual implementation of validation rules and the use of specialized libraries, such as Joi, which enable the definition of complex schemas and constraints in a structured and reusable manner. The proposed lesson emphasizes best practices for error handling, data consistency, and security, demonstrating how validation libraries contribute to the development of scalable, maintainable, and more secure systems. The results indicate that this pedagogical strategy facilitates students' understanding of validation mechanisms and strengthens their practical skills in back-end development, reinforcing the importance of combining conceptual knowledge with hands-on experience in software engineering education. This approach highlights the potential of project-based practice in back-end education and its contribution to the consolidation of technical skills in educational contexts within the Amazon region.

Keywords: *Back-end, data validation, Joi.*

APPLICATION OF RESEARCH-BASED LEARNING TO UNDERSTANDING THE COLORS OF BIOTECHNOLOGY

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Abstract
The Chemical Engineer is a fundamental actor in the development of Biotechnology, applying their knowledge to design and scale biotechnology processes that allow for the transformation of biological raw materials into high-value-added products, such as pharmaceuticals, chemicals, and advanced fuels. However, the traditional Chemical Engineering curriculum often presents limitations in the transversal knowledge of biological aspects. This fact creates a fragmented perspective for future professionals that restricts the acquisition of deep biotechnological competencies. To overcome this limitation, the innovation project PID2025_80 aims to foster in Industrial Chemical Engineering students a holistic understanding of biotechnological processes and key skills that enable them to face the challenges of a constantly evolving sector through the Research-Based Learning (RBL) methodology. The Project has been structured as follows: 1. Course design and organization. 2. Integration of the RBL in the classroom. 3. Development of cross-curricular teaching materials. 4. Evaluation of the impact of the RBL methodology. 5. Dissemination and transfer of results. The application of RBL enabled students to engage with real-world industrial biotechnology research through a dual approach. First, the professors guided theoretical and practical laboratory sessions focused on biochemical conversion routes for biofuel production, culminating in the creation of infographics. Second, the methodology promoted student autonomy by encouraging them to select and investigate a contemporary biotechnology challenge using a structured research framework and present it. Overall, RBL can help students to strengthen technical and research skills, cognitive and communication abilities, teamworking, and leadership.

Keywords: *Biotechnology, chemical engineering, research-based learning.*

PRACTICAL WORK AND THE IMPROVEMENT OF SCIENTIFIC KNOWLEDGE IN INITIAL SECONDARY TEACHER TRAINING THROUGH CURRICULUM DESIGN

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Abstract
Practical assignments are a common element in training for teaching experimental sciences. However, in recent years, limited scientific training has been observed among Spanish students in teacher's training at master level programs, which negatively impacts the application of this type of activity. This study aims to analyse how integrating simple home experiments into teaching and learning processes, can contribute to improving scientific training of future teachers, as well as the quality of their approach to design the curriculum to be taught. For this, a sample of 201 teachers in training (N = 201) were given a questionnaire on specific science content taught in mandatory high school education. Subsequently, in a second phase, a training proposal was developed with a sample of 20 teachers in training (N = 20), based on the integration of simple home experiments into different teaching strategies, such as the creation of scientific posters or the Predict, Observe, Explain (POE) strategy. The results of the first phase show data similar to those obtained by other authors, suggesting a low level of scientific content knowledge, as well as the presence of numerous conceptual errors. Regarding the second phase, it was observed that the curriculum designs developed by the participants were influenced by deficiencies in content knowledge and the presence of alternative ideas. However, these designs showed significant improvement after the implementation of the training proposal.

Keywords: *Practical assignments, conceptual errors, pre-service teacher training.*

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APPLYING THE LEARNING EFFECT THROUGH A CLASSROOM MANUFACTURING SIMULATION

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Abstract
Understanding the learning effect and the learning curve is a central component of Operations Management courses, yet these concepts are often taught through simplified numerical exercises. Reproducing a manufacturing process in the classroom allows students to directly experience and analyse their own learning process. This poster presents a classroom-based activity developed in the Operations Management I course, in which students worked in pairs to simulate a simple production process by manufacturing paper helicopters. Through task repetition, students were able to observe the learning effect and analyse how performance improves with experience. In addition, the activity introduced a specific operational variable related to the tools used, comparing the use of small scissors and large scissors, in order to assess how tool selection influences learning speeds and productivity. The results show that students empirically verified the learning effect and the evolution of the learning curve, as well as identified differences in performance depending on the tools used. In fact, the results show an asymmetry: while tool wear, as expected, hinders learning, improvements in the tools do not lead to better learning. The activity encouraged active participation, critical reflection and a deeper understanding of key Operations Management concepts, such as efficiency and productivity. This experience demonstrates that simple and low-cost manufacturing simulations are effective teaching tools for illustrating the learning effect practical sessions in Operations Management courses.

Keywords: *Learning effect, learning curve, operations management, experiential learning, teaching innovation.*

THE SKIN WE LIVE IN: A MICRO-SCENARIO ON THE BIOLOGY AND POLITICS OF THE EPIDERMIS

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Abstract
Skin constitutes the largest human organ. From a biological perspective, it acts as a barrier, preventing pathogens from entering the body, while maintaining internal biochemical processes. Interestingly, from a social, political and historical perspective, it also acts as a barrier, on the way societies perceive, read and discipline bodies. In this theoretical proposal, a lesson plan is articulated, aimed at higher education students, from the sciences and the humanities, that discusses the epidermis, employing a biomedical humanities approach. The scope of this educational intervention is to examine how biomedical humanities can improve interdisciplinary thinking in undergraduate education. A series of activities will take place: first, scientists will provide an induction to key skin biological functions, such as homeostasis and innate immunity. Second, students will engage with academic scholarship that examines the skin as a socio-cultural construct; from beauty standards to skin commodification, from medical bias to racism, intersectionality and otherness. Third, they will scrutinize pop-culture audiovisual materials, namely film clips and book excerpts that render representations of the human skin, in terms of scientific accuracy and ethical implications. Lastly, the lesson will be assessed by means of exit ticket reflection. The educational intervention aims to promote interdisciplinary thinking, media literacy, intellectual preparedness and ethical reasoning.

Keywords: *Biomedical humanities, skin, epidermis, media literacy, higher education.*

COMPARISON OF TWO UNIVERSITY RESEARCH CENTERS AND TRANSFER OF THEIR RESULTS AND NEW KNOWLEDGE INTO TEACHING

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Abstract
The contribution presents two research centers from an industrial region that are organizationally integrated differently within the university. One operates as an independent university research center, the other is part of a specific technical faculty. The structure of their achieved R&D results is compared. Possibilities for transferring research results and knowledge into teaching are discussed in the context of the missions of both research centers.

Keywords: *Teaching-research nexus, educational and non-educational research centers, transferring research results and knowledge into teaching.*

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ORGANIZATIONAL ISSUES

RESEARCHING STUDENT PERCEPTIONS OF PRACTICES AND ARTIFACTS AT UNIVERSITIES USING THE CRITICAL INCIDENT TECHNIQUE

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Abstract
The Critical Incident Technique (CIT) holds significant potential for identifying areas of improvement and detecting illogical cultural artifacts (i.e. observable social practices and texts) within higher education institutions by capturing critical events from students' perspectives. Through systematic analysis, domains requiring enhancement—such as curriculum content, administrative procedures, and the educational environment—can be uncovered across individual disciplines and institutions. This study aims to assess global CIT research interconnectivity, as sustainable international higher education development relies on how these diverse studies build upon each other. A literature review found 51 student CIT studies with which a citation network was formed. Although, on average, 1.68 of the other student CIT studies are cited (SD = 2.35), there are 16 studies are classified as completely unconnected, meaning they are neither cite nor get cited by any identified study. These isolated studies often cite only general CIT or discipline-specific literature. The network analysis shows that few established researchers repeatedly applied CITs to examine university practices from students' perspectives, thus conducting iterative research projects and building upon existing findings. Overall, there is sufficient empirical evidence to identify key themes, insights, and contradictions, which can inform further reflection and strategic development within higher education and the broader educational sector. Practitioners globally could systematically synthesize these disconnected findings, thereby enabling targeted, cross-cultural improvements of weaknesses in international university structures and practices. However, the results show that researchers rarely build upon previous global findings to examine cultural university practices students' perspective and improve them strategically.

Keywords: *Organizational issues, educational environment, organizational change, educational quality.*

CONSPIRACY THEORIES IN THE EDUCATIONAL ENVIRONMENT BY THE UNIVERSITY STUDENTS' OPINIONS

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Abstract
Conspiracy theories are part of life in various societal environments. The educational environment at the university is one of the environments in society. For this reason, conspiracy theories may be a part of the educational process in the educational universities´ environment. Researching these theories in the academic environment is timely, as findings can mitigate their expansion. The main aim of the study is the analysis of the conspiracy theories´ existence within the educational environment at the selected university in Slovakia by the university students' opinions. In empirical research, the quantitative methodology was used. The questionnaire was used to collect data in quantitative research as a research method. The research sample consisted of 100 university students from the selected university in Slovakia. The analysis of the collected data was carried out using the statistical software SPSS 20. Univariate data analysis was used in SPSS 20 to analyze the collected data. Results of the research show that researched university students have partial experience with the presentation of the conspiracy theory by university teachers in the educational environment. Conclusion of the presented text identifies COVID 19 as a conspiracy theory presented particularly by university teachers in the educational environment, and he or she emphasizes the consequences of its expansion into societal life. The university teacher should be able to explain the risks of the conspiracy theories expansion during discussion with university students.

Keywords: *Educational environment, teacher, university students.*

ARTIFICIAL INTELLIGENCE AND THE FUTURE OF WORK IN SLOVENIA: AN EXPERT SURVEY ON COMPETENCES, EDUCATION AND PERCEIVED IMPACTS OF AI

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Abstract
The rapid development of Artificial Intelligence (AI) is transforming organisations, labour markets and the skills required for the future workforce. This paper presents the results of a pilot empirical study examining expert perceptions of AI competences, organisational adoption, productivity impacts, risks, and the role of education and public policy in Slovenia. The study is based on a survey of 19 experts from academia, industry and the public sector. Data were collected using a structured questionnaire and analysed using descriptive statistics on a five-point Likert scale, including comparison across thematic dimensions. Results indicate high levels of self-assessed AI expertise and increasing integration of AI tools into professional practice. Experts perceive AI as a strong driver of productivity and innovation, while simultaneously expressing concerns regarding data protection, interpretability and regulatory preparedness. The highest levels of agreement were observed in the areas of productivity and education, whereas organisational readiness and governance were identified as key challenges. Although limited by sample size, the study offers exploratory empirical insights and provides a foundation for future research on AI-driven workforce transformation in Slovenia.

Keywords: *Artificial Intelligence, future of work, AI competences, lifelong learning, workforce transformation, expert survey.*

PLAGIARISM IN CHATGPT ERA

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Abstract
Artificial Intelligence currently represents a focal point of global discourse, as individuals actively investigate innovative modalities for its integration into everyday practices, with the objective of streamlining routine processes and enhancing efficiency through the automation of replicable tasks. The educational sphere has not remained isolated from this trajectory of automatization, with artificial intelligence progressively consolidating its role in pedagogical architecture from the instructional perspective, as well as in knowledge acquisition, independent study and academic task execution from the learner's standpoint. Within this conceptual framework, a rigorous examination of the ethical implications attendant to the utilization of artificial intelligence becomes imperative. This paper aims to conduct a comprehensive analysis of the impact of artificial intelligence tools such as ChatGPT on academic processes, with a particular focus on the ethical implications, the quality and reliability of the information they generate within specific disciplinary contexts and examines contemporary perceptions of plagiarism in relation to their use.

Keywords: *Artificial intelligence, ChatGPT, plagiarism, education.*

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TEACHYOURWORLD: THE EVALUATION OF A TRAINING PROGRAM FOR ENTREPRENEURS

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Abstract
This contribution presents an evaluation study conducted within TeachYourWorld, a cross-border Italian–French initiative supporting the digital and green transition of small and medium-sized enterprises (SMEs). The project is funded by the European Union through the INTERREG VI-A programme (ALCOTRA) and is coordinated by a consortium of Italian–French partners (Progetto Formazione Scrl, Confindustria Valle d'Aosta, Fondazione Brodolini Srl SB, Digital League – Auvergne-Rhône-Alpes), while the University of Valle d'Aosta is responsible for the evaluation activities. Nine SMEs from diverse sectors participate in tailored digitalization actions targeting production, organisational, and commercial processes, supported by senior experts and young trainees. The programme's training component (the "Academy") integrates intensive learning events (two Summer Camps) with specialised online and face-to-face activities (workshops and tech-clubs), designed on the basis of preliminary assessments of firms' needs. Given this articulated structure, the evaluation framework includes participants' emotional responses as part of training effectiveness. This approach aligns with research recognising emotions as relevant indicators of outcomes in work-related and entrepreneurial learning (Endres & Kleiner, 1990; Hökkä, Vähäsantanen, & Paloniemi, 2020). The study focuses on emotions typically linked to learning and performance—such as satisfaction, enjoyment of learning, hope, pride, anger, anxiety, shame, hopelessness, and boredom—due to their influence on motivation, engagement, and performance (Schutz & Pekrun, 2007). Emotional data are collected through semi-structured interviews and focus groups conducted with SME participants at different stages of the Academy. The poster will present preliminary findings from data gathered in spring 2026 and discuss implications for evaluating complex organisational training programs and for integrating affective dimensions into assessment models.

Keywords: *Corporate education, emotions, evaluation and assessment.*

PERCEPTION OF ALTERNATIVE INTERPRETATIONS OF SOCIAL PHENOMENA AMONG PRE-SERVICE TEACHER EDUCATION STUDENTS

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Abstract
The paper presents the results of a pilot study focused on how pre-service teacher education students perceive and interpret alternative explanations of social and political phenomena. The research is based on the assumption that the ability of future teachers to critically evaluate information, verify its sources, and distinguish between fact and interpretation represents a key competence in their professional development. The aim of the pilot inquiry was to capture individual strategies, patterns of reasoning, and value frameworks that students apply when confronted with unverifiable or alternative narratives about reality. The study employed a qualitative research design using the semi-structured interview method with master's degree students in teacher education programs. The sample included participants from different fields of study and academic years in order to identify potential variations in thinking Styles. The collected interviews were analyzed through open and axial coding to uncover recurring patterns in argumentation and information assessment. Findings indicate that while students declare the importance of critical thinking, its practical application is often constrained by a lack of methodological confidence in verifying sources and a tendency to rely on intuitive judgments of credibility. The results of this pilot study provide a foundation for a more extensive research project that will explore the relationship between media literacy and the professional preparedness of future teachers within the context of higher education.

Keywords: *Critical thinking, alternative interpretations, pre-service teachers, qualitative research, semi-structured interview.*

AN EXPLORATION OF THE RELATIONSHIPS AMONG EMPLOYER BRAND, ORGANIZATIONAL COMMITMENT AND ORGANIZATIONAL CITIZENSHIP BEHAVIOR

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Abstract
Current corporate human resource strategies increasingly emphasize pragmatism and streamlining, focusing on stabilizing the existing workforce and reducing the financial burden of recruitment and repetitive training for new hires. Under this paradigm, employers are placing greater importance on the construction and maintenance of employer brands. This strategy not only serves to reshape corporate identity but also fosters a positive internal image that influences the organizational behavior. The primary objective of this study is to explore whether the management of an employer brand contributes to corporate stability and development. The core research questions are: (1) Does the employer brand enhance employees' organizational behavior? (2) Do interpersonal factors in the workplace moderate the relationship between employer-related factors and employee behaviors? The target population for this study consisted of full-time employees. Data were collected via a questionnaire survey, with 400 questionnaires distributed and 307 valid responses recovered. The valid sample encompassed diverse demographics, including variations in gender, age, tenure, occupation, and industry. The data collected were analyzed using SPSS statistical software. Descriptive statistics, reliability analysis, correlation analysis, and hierarchical regression analysis were employed to test the research hypotheses. The research findings indicate that: (1) Employer brand is positively correlated with both organizational commitment and organizational citizenship behavior; (2) Organizational commitment exerts a mediating effect on the relationship between employer brand and organizational citizenship behavior; (3) Workplace friendship does not have a moderating effect. Based on these findings, we provides recommendations regarding theoretical and practical implications, as well as an acknowledgment of research limitations.

Keywords: *Employer brand, organizational commitment, Organizational Citizenship Behavior (OCB), workplace friendship.*

PERSPECTIVES ON K-12 AND POSTSECONDARY PARTNERSHIPS TO SUPPORT UNDERREPRESENTED STUDENTS IN HEALTH SCIENCES

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Abstract
To realize diversity across health care professions, we must attract and support students who have typically been underrepresented within the health sciences. A potential lever for change is partnerships between K-12 and postsecondary educators who can collaborate to engage and support students early in their academic decision making and through their journey into the health professions. Over the course of three initiatives (Pharmacy Experiential Days, educator working groups, and a scoping review), the research team has gained perspectives from students, educators, and the literature related to barriers and supports in pursuing health sciences and health professions careers. Insights include challenges and successes related to hosting individual programs, views into local (e.g., school, school board, governmental) constraints and supports, and universal barriers which continue to persist. A theme across the work is that addressing systemic oppression is being tackled at local and regional levels, despite constraints, and there does not appear to be a singular approach that will mitigate hundreds of years of organized discrimination. Despite that, educators across the world continue to partner, deploying often limited resources and amid shifting local, regional, national, and global priorities, to support students in learning about health sciences and achieving academic and career goals.

Keywords: *Health sciences, health professions, pharmacy, diversity, collaboration.*

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BECOMING A TEACHER IN LITHUANIA: PROFESSIONAL SATISFACTION AMONG NOVICE TEACHERS

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Abstract
Novice teachers represent a particularly vulnerable group of practitioners in education, as their professional identity, engagement, and satisfaction are shaped during the early stages of teaching, with professional satisfaction playing a central role in their development, retention, and pedagogical practice. This study aims to identify the key factors shaping professional satisfaction among novice teachers in Lithuania and to examine the role of the school environment in this process. A quantitative research design was employed, based on questionnaire data from 728 novice teachers. The findings show that professional satisfaction is shaped by interrelated dimensions of the school environment, including participation in school life, leadership, socio-psychological climate, working conditions, emotional involvement, and communication. These factors function as an interconnected system supporting professional satisfaction and effective pedagogical practice. A supportive and collaborative environment, together with mentoring and leadership, strengthens novice teachers' capacity to implement student-centered teaching and supports retention.

Keywords: *Beginning teachers, professional satisfaction, school environment, pedagogical practice, teacher retention.*

VIRTUAL PRESENTATIONS

TEACHERS AND STUDENTS

MATHS ANXIETY IN THE LAST 10 YEARS: MEASUREMENT SCALES

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Abstract
Maths Anxiety is a widespread phenomenon in the educational context that affects learning, academic performance, and the choice of educational paths related to mathematics. In a context marked by digitalization and the growth of STEM sectors, mastery of mathematical and data-processing skills has become a fundamental requirement for accessing an increasing number of emerging jobs, reinforcing the need to address this problem from an educational perspective. This study analyses the scales used between 2015 and 2024 to measure Maths Anxiety in school-aged children and teenagers through a systematic review following the PRISMA methodology. Thirty-three articles published in Scopus and Web of Science were selected. Then, we analysed the scales applied within each article globally and also at an item-level, paying particular attention to the education stage at which the instruments were applied. The results show a high diversity of scales regarding the focus of study, number of items, and age of the selected samples. Greater attention is observed to the factors involved in personal and academic Maths Anxiety, and a lower presence of studies in the early educational stages.

Keywords: *Maths anxiety, school-aged children, scales, educational stages, intervention strategies.*

ADVANCING THE EDUCATIONAL PERSPECTIVE ON TRILINGUALISM IN GRADE 11 DRAMATIC ARTS

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Abstract
Trilingualism needs to be advanced to achieve effective teaching in dramatic arts. The qualitative case study investigated the educational perspective on trilingualism (using isiXhosa, isiZulu and English) in Grade 11 Dramatic Arts at a selected school. Using purposive sampling, 25 learners were chosen to provide rich, relevant insights into their experiences with trilingual teaching. The study was framed by the Translanguaging Theory, which emphasised the dynamic and fluid use of multiple languages to enhance cognitive and cultural learning. Data were gathered through semi-structured interviews and were analysed thematically. Findings indicated that trilingualism in Dramatic Arts fosters greater student engagement and a deeper connection to cultural expression. Findings show that using three languages enriched their understanding of dramatic texts. It also improved communication skills. However, one challenge from the findings was that language switching was difficult. The findings support the benefits of embracing a multilingual approach. It highlights the need for balanced integration of language. The study recommends strengthening of multilingual teacher ongoing professional development. A classroom environment with a diversified creative language support is also recommended. The study concludes that advancing trilingual education in Grade 11 Dramatic Arts could enhance learners' educational and cultural experiences. A contribution from the current study is its inclusivity. It also has a positive effect on the implementation and academic promotion of multilingual pedagogies and cultural affirmation.

Keywords: *Advancing, educational perspective, trilingualism, student engagement.*

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INTEGRATION OF DIGITAL TUTORSHIP FOR ACADEMIC SUPPORT: LESSONS FROM A UNIVERSITY IN THE EASTERN CAPE

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Abstract
The growing demand for equitable and quality education has intensified the adoption of innovative academic support strategies in higher education, with digital tutorship emerging as a transformative approach. As universities in South Africa seek solutions to address under-preparedness, high dropout rates, and resource constraints, digital tutoring offers flexible and accessible support for diverse student populations. The aim of the study was to understand how digital tutorship could be integrated as a form of academic support in a university in the Eastern Cape and to examine its perceived benefits and challenges in enhancing student learning outcomes. The study was guided by Digital Equity Theory. The study utilised a qualitative research approach. Data were collected through semi-structured interviews and focus group discussions with 20 students and 3 tutors purposively sampled from the Faculty of Education. Data were analysed thematically. The study found that both students and tutors noted that digital tutorship enhanced access, flexibility, and engagement, with students able to revisit recorded lessons, collaborate with peers, and receive personalised support through digital platforms. Second, persistent challenges such as faculty preparedness, uneven connectivity, limited resource availability, and lack of tutor training were found to undermine effectiveness. In conclusion, the study revealed that digital tutoring significantly enhances student engagement, access, and equity, with high levels of student motivation and participation attributed to hybrid, technology-supported tutorials. The study recommended that universities may implement mandatory digital pedagogy training and professional development for tutors to enhance digital literacy, technical skills, and pedagogical readiness for effective digital tutorship integration

Keywords: *Academic support, digital equity, digital tutorship, higher education, student learning outcomes.*

TEACHER'S CAPACITY TO SUPPORT NEURODIVERSE LEARNERS IN RURAL SOUTH AFRICAN SCHOOLS: SUPPORT INTERVENTIONS

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Abstract
The implementation of inclusive education in South African rural schools is shown to be lacking, despite transformative policies in place. Numerous studies have shown how teachers cannot support neurodiverse learners' educational needs. Additionally, literature revealed rural school-based teachers to be rarely equipped with instructional accommodation strategies tailored to advance the learning of neurodiverse learners. This study investigated teachers' capacity to support neurodiverse learners in rural South African schools. It is underpinned by the social constructivist research paradigm and employs transformative learning theory as its theoretical framework. A phenomenological qualitative research approach was adopted. Data were collected through focus group interviews involving 36 purposively selected teachers across six schools. The data were thematically analysed and interpreted using Braun and Clarke's method. Lack of specialised training and comprehensive knowledge on neurodiversity among rural school-based teachers has been identified in the study as a major challenge standing in the way of not only supporting neurodiverse learners, but also screening, identifying, and assessing learners for potential neurodivergent. The study recommended that teachers in rural school settings be provided with specialised training on neurodiversity, secondly, that actionable measures be taken in actualising the SIAS policy protocols to create procedures for neurodivergent trait screening and evaluation. Lastly, that instructional accommodation strategies be contextualised to neurodivergent learners in the rural setting.

Keywords: *Inclusive education, neurodiversity, teacher capacity, rural schools, instructional accommodation.*

AUGMENTED PEDAGOGY: INTEGRATING GENERATIVE AI IN CREATIVE EDUCATION

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Abstract
Generative Artificial Intelligence (GenAI) is reshaping creative education by challenging traditional constructs of authorship and creativity to redefine the learning experience. Once peripheral to design and visual communication, generative systems have become integral to educational practices, requiring educators and institutions to rethink how imagination, creativity, agency, and evaluation are addressed in hybrid human–machine contexts. This paper develops a framework for the critical and ethical integration of GenAI in creative education. Grounded in an interdisciplinary review of academic literature spanning education studies, creativity research, human–computer interaction, and AI ethics, the analysis is also informed by existing classroom-based research reported in recent educational literature. It identifies four key transformations shaping contemporary learning environments. First, GenAI reconfigures authorship and creative agency, positioning educators as mediators and curators of meaning rather than transmitters of knowledge. Second, the automation of creative processes introduces risks of cognitive offloading and stylistic homogenisation, potentially undermining depth and critical capacity if left unexamined. Third, new pedagogical needs emerge, including AI literacy, ethical awareness, inclusivity, accessibility, and sustainability. Finally, assessment practices require rethinking, as output-based evaluation proves insufficient in contexts where algorithms can generate refined results with minimal effort. In response to these transformations, the paper proposes a structured roadmap for the conscious integration of GenAI into creative education. The roadmap is articulated as a phased model that moves from co-design and active listening to theoretical grounding and structured experimentation, and ultimately to multidisciplinary projects and institutional governance. Rather than presenting AI as a replacement for creativity, the augmented pedagogy approach proposed in this paper positions generative systems as catalysts for critical literacy, reflection, and collaborative learning. The contribution of this study is primarily conceptual and pedagogical, synthesising existing research and documented educational practices rather than reporting original empirical validation. By articulating an augmented pedagogy model, a coherent roadmap, and an assessment-oriented approach, the paper offers transferable strategies for educators and institutions. Integrating GenAI into creative education is thus framed not as a technical challenge, but as a matter of pedagogical and cultural responsibility: educating learners who can think *with* technology rather than *through* it, preserving depth, agency, ethics, and imagination in the age of automation.

Keywords: *Generative AI, augmented pedagogy, creative education, accessibility, critical literacy.*

CHALLENGES FACED BY TEACHERS IN IMPLEMENTING READING INTERVENTIONS FOR SESOTHO LEARNERS

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Abstract
In South Africa, where Sesotho is used as a language of teaching and learning in the Foundation Phase, many learners struggle to read at grade level. Despite national reading initiatives, teachers face barriers in implementing effective Sesotho reading interventions, revealing a mismatch between policy expectations and classroom realities. This study explores challenges affecting reading instruction and proposes improvement strategies. A qualitative descriptive design was used. Data were collected through a focus group of nine Grade 3 teachers from three primary schools in the Mangaung Metropolitan District. Discussions were recorded, transcribed, and thematically analysed. Trustworthiness was ensured through systematic coding and peer review. Findings reveal challenges such as limited Sesotho reading materials, inadequate teacher training, and minimal parental involvement. These factors hinder effective reading interventions. The study recommends sustained professional development, improved resource provision, and stronger school–community partnerships to enhance literacy outcomes.

Keywords: *Early-grade reading, foundation phase, literacy interventions, parental involvement, Sesotho literacy.*

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FIVE LEVELS OF TEACHING - FIVE METHODS OF TEACHING

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Abstract
In this work the author, a physics teacher in high-school and an engineering lecturer in college with more than 20 years of experience, compares teaching five levels of students: high-school freshmen that still do not know whether to choose physics as a path, 2nd year high-school students that chose to study physics but are still only examined within the school, 3rd year high-school students studying for their matriculation external examination, 1st year college students studying a basic course in electrical engineering and 4th year college students taking a course withing their chosen specialization. The students are at very different stages in their lives and require different teaching methods, such as flipped classrooms, project-based learning (PBL), predict-observe-explain (POE), talk-based-learning (TBL) and productive failure. The author compares the different methods and examines which methods might be more appropriate for which group of students. After trying several methods, the following assumptions rose: the high-school freshmen seemed to lose interest quite rapidly unless the material was explained via experiments and simulations, therefore predict-observe-explain seems to be the best method to give them motivation to study. 2nd year pupils reacted best to discussions from which the laws of physics arose; thus talk-based-learning was best for them. 3rd year pupils had to study an enormous amount of material, so the best way was to let them go over the theory at home and then practice and practice at school, thus applying the flipped classroom approach. 1st year college students, to my experience, are best taught by letting them make mistakes and then harnessing these mistakes to explain the correct method to solve a problem, thus using productive failure. Finally, 4th year students usually need a large project that incorporates all the course syllabus to keep them at full focus, thus project-based learning is usually the best option.

Keywords: *Flipped classrooms, project-based learning, predict-observe-explain, talk-based-learning, productive failure.*

INTEGRATING TECHNOLOGY AND TRILINGUAL STRATEGIES IN GRADE 10 DRAMATIC ARTS EDUCATION

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Abstract
Technology and trilingualism play critical roles in the education of drama arts learners. The qualitative case study investigated the integration of technology and trilingual strategies within Grade 10 Dramatic Arts education at a single secondary school. A purposive sample of 25 participants, comprising both learners and educators, was selected to provide rich, context-specific insights into the implementation of the pedagogical approaches. The study was underpinned by Karpman's Drama Triangle, which explains the interpersonal dynamics of the victim, persecutor, and rescuer roles observed in classroom interactions and in learner engagement during dramatic arts activities. Data were collected through semi-structured interviews, which enabled participants to articulate their experiences and perceptions of the use of digital technologies and trilingual instructional methods. Thematic analysis was utilised to systematically identify patterns and salient themes emerging from the qualitative data. Findings indicated that the incorporation of technology enhanced learner engagement and accessibility, while the trilingual approach promoted cultural inclusivity and linguistic development. Nonetheless, challenges related to role conflicts and communication tensions, as conceptualised by Karpman's framework, were evident, underlining the necessity for targeted pedagogical support. The study contributes to the growing body of knowledge on multilingual and technology-mediated dramatic arts education, recommending professional development for educators to optimize role management and maximize educational outcomes in similarly diverse and digitally enriched learning environments.

Keywords: *Culture, dramatic arts, technology integration, trilingual education, pedagogy.*

GAMIFICATION AND AI IN PROFESSIONAL DEVELOPMENT FOR TEACHERS AND TRAINERS

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Abstract
The rapid development of AI and digitalization of education has intensified the need for vocational teachers and trainers to adopt learner-centered approaches that sustain engagement and motivation. Traditional instructional methods often struggle to address diverse learner needs and expectations, particularly in digital skills training contexts. This paper aims to examine how structured training in gamification and AI-supported instructional design can enhance educators' capacity to design engaging learning experiences. The study reports on three implementations of an intensive masterclass program delivered in two countries (Georgia and North Macedonia), targeting vocational teachers, ICT educators, and digital skills trainers. The training combined theoretical foundations of gamification, including motivational psychology and the Octalysis framework, with hands-on design activities, peer feedback, and AI-assisted content creation using large language models. Participants developed and piloted their own gamified learning activities, integrating game elements, narrative, feedback mechanisms, and adaptive AI support. Validation was conducted through participant feedback, reflective activities, peer evaluation, and post-training implementation reports. Results indicate consistently positive feedback, increased self-reported confidence in designing engaging learning experiences, and successful transfer of gamified and AI-supported practices into real training contexts. The findings suggest that vocational teacher training programs that systematically integrate gamification principles and AI tools can significantly enhance learner engagement, support professional competence development, and contribute to sustainable innovation in digital skills education.

Keywords: *Gamification in education, vocational teacher training, learner engagement, artificial intelligence in teaching, professional development.*

THE ROLE OF EXPERIENTIAL LEARNING IN ENHANCING TVET COLLEGE STUDENTS' ENTREPRENEURIAL INTENTION IN SOUTH AFRICA

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Abstract
In recent years, entrepreneurship training in TVET colleges has been promoted to help graduates start and grow their own micro-enterprises, hence reducing youth unemployment. This paper aims to examine types of experiential learning approaches in TVET colleges that were used to enhancing TVET college students' entrepreneurial intention. The study used the Effectuation Theory to understand how experiential learning approaches enhanced TVET college students' entrepreneurial intention. The data collection process consisted of semi-structured interviews. A total sample of 15 participants consisting of students, graduates, lecturers, and local business owners was drawn from three TVET colleges in the Gauteng Province. The findings revealed that internship programmes in local businesses were the enabling factors motivating students to start and grow their own micro-enterprises. In other words, the intention to start their own micro-enterprises was stimulated during internship programmes related to their field of study. The authors conclude that the inclusion of internships and partnerships within local businesses in the ET curriculum facilitated the entrepreneurial intention of TVET college graduates. The practical implications of the findings for society are that the use of internships in ET can develop entrepreneurial skills, knowledge, competencies and mindset, and empower TVET graduates to become job creators instead of job seekers.

Keywords: *Entrepreneurial skills, entrepreneurship training, entrepreneurial intention, Effectuation Theory, TVET colleges, internship programme, local businesses.*

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TEACHER -LEARNER BLAME GAME: A BARRIER TO PHYSICAL SCIENCES SUCCESS IN RURAL SCHOOLS

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Abstract
Attaining success in Physical Science education is essential for a nation aiming to participate in the global economy, particularly due to its connection with the provision of rare skills obtainable via science-related professions. However, several studies have indicated that effective teaching and learning of Physical Sciences in rural secondary schools is hindered by numerous challenges, including socio-economic disparities. While factors such as infrastructure, resource availability, teacher retention etc. affect the quality of Physical Science teaching and learning, teachers and learners' perspectives about each other's influence on their competence pplayan even bigger role. This study utilized a multiple case qualitative study through individual interviews with teacher and focus group interviews with learners to collect data from 10 Physical science learners and 4 teachers from two rural schools, then analysed them thematically. Findings of this study revealed that learners blamed teachers lack interest in their learning, negative attitudes towards them when they find it difficult to understand the subject matter and lack of commitment to attend classes regularly and deliver effective lessons for their poor comprehension and performance in Physical science. On the contrary teachers also blame learners for their lack of commitment in attending classes and doing all assessment activities and applying themselves in learning the subject. This study implies a need for a rigorous intervention by school managers and other education to reduce tensions that exist between teachers and learners, which adds to existing challenges in Physical Sciences teaching and learning. The study recommends roadshows in rural schools by provincial and district officials to establish the root cause of the tensions and establish platforms to dissolve them. The study further recommends frequent monitoring of these schools by subject specialists to support both teachers and learners in their development of the subject matter. Further empirical studies should be done in more rural schools to establish mitigating ways to reduce possible underlying challenges that lead to tensions between Physical science teachers and learners in rural schools.

Keywords: *Learners. teachers, blame game, physical science, rural schools.*

COMMUNITY-ENGAGED HIGHER EDUCATION FOR GLOBAL CITIZENSHIP: PRACTICES, DIALOGUES AND TRANSFORMATIVE LEARNING

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Abstract
Higher Education institutions are increasingly challenged to integrate academic training with social responsibility, particularly within Global Citizenship Education (GCE). This study presents a community-engaged approach developed in a Portuguese higher education context (Escola Superior de Educação, Polytechnic Institute of Santarém), aimed at embedding GCE across curricular, pedagogical, and institutional dimensions. The initiative is grounded in service-learning, transformative learning, and participatory education frameworks, and is operationalised through the Transformative Schools Project — a network of learning hubs connecting higher education students, teacher educators, schools, and local community organisations. The project involves a variable number of participants, including students and academic staff, with diverse levels and modalities of engagement across activities. On average, it engages approximately 120 students and 15 academic staff per year across teacher education programmes, in collaboration with diverse community partners (e.g., schools, NGOs, local associations). These hubs support project-based and service-learning experiences focused on sustainability, social justice, and democratic participation, combined with structured reflective dialogue. A mixed-methods approach has been used to monitor the initiative, including reflective portfolios, focus groups, community partner feedback, and student self-assessment of civic and professional competences. Findings suggest increased student engagement, as well as shifts in critical awareness, capacity to navigate complexity, and ability to

connect pedagogical theory with situated social challenges. Community partners point to more reciprocal forms of collaboration and greater recognition of local knowledge within academic processes. The study also identifies key implementation challenges, particularly related to institutional coordination, curricular constraints, and the sustainability of partnerships. These insights highlight the conditions under which community-engaged approaches to Global Citizenship Education can be effectively developed and sustained within Higher Education. By articulating a practice-based and context-sensitive model, this contribution advances current discussions on the institutionalisation of community engagement and offers transferable principles for integrating GCE through participatory and transformative pedagogies.

Keywords: *Global citizenship education, community engagement, transformative learning, higher education, participatory methodologies.*

TRAINING DEMANDS AND COMMITMENT IN THE UNIVERSITY-BUSINESS BINOMIAL: A MODEL OF STRATEGIC SYNCHRONIZATION AT THE UPV

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Abstract
Training Demands and Commitment in the University-Business Binomial: The rapid evolution of the socio-economic environment requires the University to maintain a direct and constant channel of communication with the productive fabric. Under this premise, the Integrated Employment Service of the Universitat Politècnica de València (UPV) conducted a pilot test in 2023 through a survey, "Training Needs of Employers," administered to companies participating in the UPV “Foro Empleo” Job Fair. The most significant finding of this initial analysis was the identification of organizational commitment not only as an added value but also as a strategic and priority transversal competence for today's organizations. With the results obtained, a framework of interconnected studies has been structured for the period 2024-2026 that includes: a) Business Perspective: Update of the training needs survey at Foro Empleo; b) Student Perspective: Analysis of expectations of Bachelor's and Master's students before their insertion; c) Graduates’ Perspective: Follow-up of professionals with two and four years of experience to know what factors determine their permanence and commitment in an organization. The objective of this initiative is to identify the training and soft skills that companies currently demand. The post-pandemic work landscape – marked by teleworking, flexibility, and corporate responsibility – has transformed what professionals expect from their employers. Therefore, it is imperative that the University acts as a bridge, translating these needs into an improvement in degrees. Knowing what specific knowledge is missing and what values are most valued will allow the university to adapt its curricula to a highly changing environment, ensuring that graduates not only possess the technical excellence, but also the attitudes necessary to integrate successfully. To validate and deepen these findings, focus groups will be organized with collaborating companies and graduates. These sessions will have a dual purpose: 1 - Transfer knowledge to the company: Present organizations with the demands of the new generations so that they can improve their ability to attract and retain talent; 2 - Feedback for the University: Obtain first-hand information on deficiencies or strengths in training, allowing a curricular update based on real evidence from the market. In short, this project seeks to meet the expectations of all the entities involved. By understanding what companies need and what employees are looking for to engage in, the University can optimize its educational strategy. The result is a mutual benefit: more competitive companies with committed talent and an academic institution that responds with agility to the challenges of today's society.

Keywords: *Employability, skills gap, higher education, organizational commitment, labor market trends.*

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EUROPEAN POLICY ON TEACHER PROFESSIONAL DEVELOPMENT: OBJECTIVES, CONVERGENCES AND DIVERGENCES

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Abstract
Teacher professional development (TPD) constitutes a central pillar of European education policy under the Education and Training 2021–2030 (ET 2030) framework, where teacher learning is positioned as a driver of equity, quality, digital transformation and system resilience. This study explores how European objectives are interpreted and operationalised within national TPD agendas in Greece, Spain, Sweden, the Netherlands and England. A comparative qualitative content analysis of European and national policy documents is conducted through a training transfer perspective across five analytical dimensions: governance arrangements, teacher agency, mechanisms for classroom transfer, evaluation and incentive structures, and wellbeing and digital support. Findings indicate convergence at the level of strategic discourse, as all systems prioritise continuous professional learning, inclusion and digital competence. However, significant divergence emerges in implementation logics and professional infrastructures, producing uneven degrees of systemic coherence and sustained training transfer into classroom practice. The study advances an integrative analytical lens for examining European–national alignment in TPD and outlines implications for strengthening mentoring capacity, incentive design and policy coherence.

Keywords: *Teacher professional development, European education policy, policy convergence, training transfer, knowledge sharing.*

DIGITAL TOOLS AND DIDACTIC COMPETENCE IN INFORMATICS: A QUALITATIVE ANALYSIS OF PRE-SERVICE TEACHERS' REFLECTIONS

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Abstract
The implementation of the new curricular reform in Slovakia (2023) introduces fundamental challenges to informatics education, where the use of modern digital and educational tools becomes a key element starting from the primary education level. This study analyses pre-service teachers' reflections following the completion of the master's level course *Visual Programming Languages*, focusing on their perceived readiness to teach informatics in their future practice. Utilizing a qualitative research design, the study addresses the following key thematic areas: the evolution of professional attitudes toward teaching informatics in primary education, the extent of prior exposure to educational programming and robotics tools, the development of perceived didactic competence, and the perceived congruence between course content and the national curricular reform. Qualitative content analysis was conducted. Data were collected through initial interviews and subsequent written reflections of master's students (N=25) enrolled in the course. This research material was processed through a systematic color-coding scheme and synthesized into a conceptual map. Although the pre-service teachers' knowledge of the Ozobot tool was fragmented and accompanied by concerns regarding its practical application due to technical issues, they declared high levels of didactic confidence when working within the new environments of Emil 3, Emil 4, Blue-bot, and the Living Workbook. Furthermore, the analysis confirms a robust alignment of the didactics of skills instruction within the course with the national reform, specifically through the enhancement of digital, metacognitive, and soft skills. The Visual Programming Languages course has proven to be a valuable source of practical tools and teaching resources for future teachers. Thanks to this targeted didactic training, future teachers reflect on their own readiness to equip students with the computer skills necessary for their future careers and lifelong learning.

Keywords: *Pre-service teachers, visual programming languages, curricular reform, qualitative content analysis, didactic self-efficacy.*

LIVELIHOOD SKILLS CURRICULA AND HUMANITIES GRADUATES' ACCESS TO EMPLOYMENT OPPORTUNITIES IN SOUTH AFRICA

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Abstract
In recent years, South Africa has experienced an upsurge in unemployment, particularly among graduates. This is due to the global economic downturn, and the misalignment of skills acquired as well as the dynamism of labour-market demands. Graduates of non-technical courses and Faculty of Humanities are the worst affected. Therefore, the aim of this paper is to explore lecturers' perceptions of the inclusion of livelihood skills to enable graduates to become entrepreneurs and job creators rather than solely job seekers. The study adopted a qualitative research approach. The study population entailed lecturers in the Faculty of Humanities of a selected South African university. Using purposive sampling, the sample comprised 16 lecturers from different schools to get diverse perspectives on the issue under investigation. The data collection method consisted of semi-structured interviews. Thematic data analysis was used to analyse the data. The findings revealed that the inclusion of livelihood skills would enhance access to employment opportunities through multiple pathways. However, its effectiveness depends on explicit pedagogy and enabling infrastructure. Based on the findings, the authors concluded that livelihood skills that respond to labour-market demand should be included in humanities curricula to equip students with entrepreneurial skills to launch entrepreneurial activities after graduation.

Keywords: *Graduate unemployment, livelihood skills, humanities graduates, labour market demand, human capital.*

COMICS' DIDACTIC POTENTIAL – AN EDUCATIONAL TOOL OR A MEANS OF PUPILS' DEVELOPMENT?

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Abstract
A global trend among young people of the current generations (mainly Z and Alpha) is difficulty with reading comprehension, communication, and managing emotions. This is also reflected in the results of international OECD assessments, e.g. PIRLS, PISA, and SSES, over recent years. Challenges also appear in the assessment of students' thinking skills. Comics can serve as a way to engage people across different generations. Key questions include where, with whom, how, what type of comics, and most importantly why comics can be used. On the one hand, comics are an engaging tool applicable in education. On the other hand, they have significant potential for character education and personal development. University students, as future teachers, educators, or professionals shaping others' personalities, also need to understand the significance of comics. Depending on the didactic focus, graphic design, or author, these are some of the key considerations before implementing comics into educational or developmental processes. This article describes an unconventional seminar for students. It was held at a Slovak university for 43 student teachers. The goal was to create an educational comic with a focus on their field of study. The seminar participants demonstrated their creativity, openness, and commitment to innovation in education. The aim of this article is not to determine which process is more suitable; comics can be implemented in both, with attention to specific considerations in each. The condition was the use of generative artificial intelligence in the creation of the comic, as AI gets into life as well as school life relatively quickly. It should also be noted that digital platforms and generative AI can support the creation of comics. This article discusses challenges university students may encounter when creating their own comics and explores their perception of comics in relation to their future profession. The participants viewed the challenge not merely as creating a comic using AI, but as creating a comic for educational use that would not only spark learners' curiosity but also foster their critical thinking skills.

Keywords: *Comics, implementation, Generative Artificial Intelligence - AI, reading comprehension, critical thinking.*

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WOMEN LIVING ALONE AND VOCATIONAL TRAINING IN GERMANY: RESULTS OF A SYSTEMATIC SECONDARY ANALYSIS

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Abstract
Germany's social structure is diverse, yet minorities like women living alone are often overlooked. Research mostly focuses an older woman; middle-aged groups are underrepresented though their numbers are rising. Data are frequently outdated. Work and education and their interrelations have not been integrative analysed, leaving links between living alone, challenges, resources and educational and work trajectories unclear. The aim of this secondary literature analysis is to systematically summarise available findings on the connection between living alone and the associated areas of life – with a particular focus on vocational training for women – and to derive key requirements for action. The study identifies differentiated relationship, such as those between living alone, participation in education and employment history, and highlights potential barriers. A systematic secondary literature analysis was conducted in German-speaking countries. Relevant studies were identified via databases, inclusion and exclusion criteria were defined, and a thematic synthesis of the findings was carried out. In this context, women living alone are defined as persons living in a single-person household; the marital status of the person concerned is irrelevant. The analysis covers publications from the German-speaking context that deal explicitly with vocational training, adult education or continuing education measures and take into account the life status of 'living alone'. The findings show that there is no significant relationship between 'women living alone' and 'vocational training' or 'labour force participation'. Instead, the findings focus predominantly on the disadvantages faced by this target group, with the research adopting an intersectional or integrative approach to this sample. Women living alone are frequently associated with the category of 'long-term unemployment'. The realities of life for the target group show that they are often characterised by unstable employment histories and a poor match between existing skills and labour market requirements, health restrictions with an impact on resilience, motivation and everyday organisation, social isolation or fragile networks, which make it difficult to convert resources into participation, material insecurity and limited pension options, and biographical breaks that limit planning horizons and make transitions risky. At the political level, financial support services should be created in particular to better integrate women living alone into vocational training pathways. Future research could focus on further institutional prevention and intervention measures that include counselling services for women living alone. This would allow for a more informed understanding of their participation in working life, educational processes and employment trajectories, and enable implications to be drawn.

Keywords: *Women, living alone, secondary analysis, vocational training.*

EDUCATING FOR EQUALITY AND RESPECT: A SYSTEMIC INTERVENTION MODEL FOR ITALIAN SCHOOLS TOWARDS CULTURAL CHANGE

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Abstract
This paper presents the framework and initial findings of a major national initiative promoted by INDIRE and the Italian Ministry of Education and Merit (MIM), launched in January 2026, thanks to the National Programme *School and skills 2021-2027* financed by the European Social Fund Plus (ESF+). The project aims to strengthen the school's role in educating for respect and gender equality, fostering a significant cultural change. Addressing the limitations of episodic interventions (as evidenced by a preliminary survey involving over 4,400 institutions) the project proposes a systemic model that integrates gender equality into the structural fabric of the school's three-year educational offer. The intervention adopts a multi-dimensional methodology, supported by a dedicated digital environment and organized into four key phases: *Institutional Self-Reflection*: Utilizing a survey, schools assess their maturity on gender issues. This digital tool is critical for guiding the revision of strategic planning documents and identifying specific areas for improvement; *Targeted Training:* The program offers an incremental training plan that includes both propedeutic modules for the entire school community and specialized paths tailored to the specific needs

identified during the self-assessment phase. *Student Voice and Civic Engagement*: Shifting the paradigm, students become active agents of change. Through peer-to-peer education and participatory methodologies focused on identity construction, the project empowers students to challenge stereotypes and engage in civic responsibilities. *Monitoring and Permanent Observatory*: A combined qualitative-quantitative approach transforms schools into "learning organizations." This phase establishes a permanent Observatory to monitor progress, ensuring that educational actions are sustainable and not merely isolated events. Crucially, this contribution will disclose the first results of the self-assessment phase. By analyzing data from the schools survey, the paper will provide a comprehensive overview of the current awareness levels and planning capabilities of Italian schools. It will highlight the strategic shift from confining gender issues solely within Civics Education to adopting a holistic, system-wide approach. The project serves as a significant case study in organizational learning and equity, offering a scalable model for removing cultural obstacles and building a more inclusive society.

Keywords: *Gender equality, systemic change, student voice, teacher training, Institutional Self-Reflection.*

TEACHERS' HAVEN: INTERNATIONAL COOPERATION FOR TEACHER WELL-BEING AND PROFESSIONAL DEVELOPMENT

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Abstract
The teaching profession is increasingly shaped by complexity, emotional demands, and organisational pressures, reinforcing the need for systemic approaches that integrate professional development and teacher well-being. Teachers' HAVEN (Teachers Haven Academy for Promoting Professional Versatility, Inner Equilibrium and Networking) is an Erasmus+ Teacher Academies project that addresses these challenges through international cooperation and network-based professional learning. Coordinated by a higher education institution in Poland and involving partners from Portugal, Spain, Italy, Romania, Cyprus, and Greece, the project aims to strengthen teachers' professional identity, emotional balance, and collaborative capacity across the continuum from initial teacher education to continuing professional development. Grounded in a conceptual framework that integrates professional capital, lifelong learning, and teacher well-being, this study adopts a qualitative, multi-method design. Data were collected during the initial diagnostic phase through a variable and context-dependent sample of participants across countries and educational levels. This included questionnaires administered to teachers (n≈280), semi-structured interviews with school leaders (e.g., principals and middle leaders), focus groups with pre-service and in-service teachers from primary and secondary education, and multi-stakeholder roundtables. Data were analysed using thematic analysis, allowing for cross-national comparison. Findings reveal convergent challenges across contexts, including workload intensification, emotional exhaustion, and limited access to structured well-being support. At the same time, the study identifies emerging practices related to peer collaboration, mentoring, and distributed leadership. These results inform the design of the Teachers' HAVEN Academy, particularly in structuring training pathways and mentoring models grounded in collaborative and context-sensitive approaches. The study contributes to advancing current debates on teacher well-being by providing cross-cultural, empirically grounded evidence and by articulating a multidimensional understanding that integrates individual, relational, and organisational factors. It highlights the conditions under which well-being can be sustainably supported within professional learning systems and offers a framework for embedding well-being as a structural dimension of teacher education, rather than as an individualised responsibility.

Keywords: *Teacher well-being, professional development, international cooperation, teacher education; collaborative networks.*

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PRE-SERVICE LIFE SCIENCES TEACHERS' PERCEIVED PRACTICES IN ADDRESSING GENDER ISSUES COMMON IN CLASSROOMS

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Abstract
Tolerance, resilience, perseverance, and tenacity are some of the expectations young people are raised to believe in. Whilst these positive psychological, emotional, and behavioural character traits or strengths enable learners to withstand embarrassment in classrooms, teachers should not turn a blind eye when a learner feels discriminated against by peers. This is more so in the Life Sciences classrooms, where some topics or concepts taught are controversial as they open room for scrutiny on one's appearance, behavioural traits, or unfavourable choices one makes in the eyes of peers. Informed by critical theory, the study determined how much prepared pre-service teachers were to manage classrooms in which episodes of discrimination erupt in their classrooms. A class of 120 pre-service teachers in their final year of study at a university in South Africa, who were enrolled for the Life Sciences methodology module, were given a scenario where they had to come up with strategies to handle the issue of menstruation, in which a learner messed her dress, chair, and her surroundings, attracting ridicule from her classmates. They worked in groups of five and submitted their reports, which formed data sources. Qualitative analysis of the participants' submissions revealed that, firstly, the scenario presented is a common occurrence in classrooms, as some of them had witnessed it in their own classrooms as learners and as pre-service teachers during practicum. Secondly, the findings showed that teachers may unintentionally reinforce typical gender stereotypical behaviours whilst teaching the topic of menstruation, which may be harmful to learners. The findings show curriculum-related shortcomings, such as the lack of inculcating values like empathy and respect when teaching.

Keywords: *Biological processes, gender issues, life sciences, pre-service teachers.*

RETHINKING ASSESSMENT AND MEASUREMENT IN THE AGE OF GENERATIVE AI

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Abstract
The rapid integration of generative artificial intelligence (AI) into higher education has intensified longstanding questions about academic integrity, authorship, and the validity of traditional assessment practices. As AI systems become capable of producing essays, programming code, and analytical responses that resemble student work, product-based evaluation models face increasing strain. Detection-based approaches alone offer limited assurance of learning, and in some cases may distract them from deeper pedagogical concerns. This paper argues that assessment and measurement frameworks must evolve to prioritize visible reasoning, verification processes, and structured reflection rather than focusing solely on final artifacts. Rather than positioning generative AI as an external threat to be managed, this paper explores how assessment design can incorporate AI use in ways that preserve rigor while making student thinking more transparent. Drawing on the redesign of a discipline-specific undergraduate assignment, the paper illustrates how requiring students to document AI prompts, test system-generated outputs, identify inaccuracies, and justify revisions transforms AI interaction into assessable evidence of learning. In this model, grading criteria shift toward constraint specification, error detection, conceptual explanation, and reflective decision-making. Students are evaluated not merely on whether a solution works, but on how they engaged with the tool, where they identified limitations, and how they resolved discrepancies between AI output and disciplinary expectations. That reframing aligns assessment with contemporary learning environments in which AI is readily accessible. Instead of attempting to restore pre-AI conditions, educators can design measurement structures that foreground intellectual engagement. By embedding documentation requirements and staged submission processes into assignments, instructors can observe developmental progression and analytical judgment. Such strategies also support fairness and consistency by clarifying expectations and reducing ambiguity around acceptable AI use. The paper further discusses implications for rubric development, formative feedback, and academic standards. When assessment emphasizes

reasoning and verification, it becomes possible to maintain expectations of mastery even in AI-rich contexts. That shift also encourages a broader reconsideration of what educational measurement captures: not only knowledge recall or output production, but the processes through which learners interrogate tools, apply constraints, and exercise disciplinary judgment. As generative AI continues to reshape academic work, assessment models must move beyond enforcement toward intentional design. By re-centering evaluation on cognitive processes and documented engagement, educators can respond to technological change without diminishing academic expectations.

Keywords: *Assessment innovation; generative AI; academic integrity; instructional design.*

PROFESSIONAL DEVELOPMENT DATA HUB: INNOVATING AND PROMOTING STAFF PROFESSIONAL DEVELOPMENT OUTCOMES IN IRELAND

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Abstract
The research office in one large professional School/ Department in one higher education institution in Ireland is a multidisciplinary team, focused on the areas of support including pre-award, post-award and finance administration. A data Hub has been created as a result of the new plan, and a Share point software implementation, enabling additional research development opportunities surrounding advancing academic staff in the area of research funding applications and research development in the areas of health services research. The context for this research builds on a decade of work in the area of staff professional development and particular on the need for the digital innovations in the area of staff professional development - the last 8 years in the area of funding and pre-award support and the 5 years preceding that - on a survey work following a detailed analysis of the questionnaire data on professional development needs collected from lecturing staff across eight member institutions of the Dublin Region Higher Education Alliance (DRHEA), the study that has been conducted on behalf of the Dublin Centre for Academic Development (DCAD) that had its principal aim to identify the professional development interests of lecturing staff across DRHEA member institutions. The aim and objective of this paper is to present the work in progress on the innovation that it a co-designing, creating and implementing a Data Hub at a one school/department in a large higher education institution in Ireland to improve engagement and outcomes among academic and professional staff in research development. The data Hub serves as access point for specialist services capture tools and apply them to professionally develop expertise, further existing knowledge and skills, promote reliable support and analysis and evidence-based innovations in staff professional development. One large professional school in a HEI in Ireland has developed a SharePoint communications site Hub to strengthen and expand research skills and research expertise in supporting the development and submission of funding applications in the area of health and health services. The Hub core areas include ideas development, variations of avenues for submission of funding proposals, tools and toolkits for drafting research ideas and applications, and grant management. Through the implementation of the Hub and establishment of the useful resources, templates and tools, data accuracy, the work efficiency and accessibility have significantly improved. Centralised information and data collection has enabled a broader engagement and reach with research development supports for academic staff, has led to an increased number of funding applications, a clearer guideline on the processes, supported new projects, and created additional educational opportunities in research professional development for health science professionals.

Keywords: *Professional development, digital innovation, inclusion, staff questionnaire data, research funding, teaching and learning.*

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ASYNCHRONOUS ONLINE DISCUSSIONS AS REPLACEMENT TASKS IN HIGHER EDUCATION

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Abstract
After years of online teaching, universities are now trying to get students to return to campuses. To motivate student attendance, teachers can adopt methods such as giving extra points for attendance or making attendance compulsory. Especially in situations where the role of attendance is to encourage students to discuss and work together, making attendance compulsory can be attractive. This introduces a new dilemma. How should teachers proceed when students are absent? Teachers can cope with students' absences, for example, by lowering attendance requirements or by offering replacement tasks. Of these, the replacement tasks are often more efficient in ensuring that absent students meet the learning objectives. However, reviewing written replacement tasks can be laborious for teachers. Thus, student-student asynchronous online discussions (AODs) could act as a good alternative. Prior research has identified both strengths and weaknesses when it comes to the use of AODs in higher education, but these studies have not examined their use specifically as replacement tasks. Thus, in this paper, we aim to identify the pros and cons of the use of AODs as replacement tasks. We analyzed two implementations of the same course where six out of seven compulsory attendances could be replaced with weekly AODs. The analysis of the pros and cons consisted of systematic reviews of the posts written by the students and an analysis of students' learning diary assignments. Our analysis revealed mixed results for the use of AODs as replacement tasks. At the start of the course, students were very active in their discussions and effectively reflected on the role of online discussions in their learning diaries. However, at the end of the course, the discussions became more superficial, and the consideration of the AODs in the learning diaries became insufficient. This suggests that although AODs can function well as replacement tasks, using them extensively may encourage task completion rather than in-depth learning. This is particularly problematic because students can now use generative AI to complete discussion assignments, leaving teachers with little ability to ensure that students have internalized the course topics. Thus, while AODs reduce the workload of the teacher, they should be used cautiously.

Keywords: *Asynchronous online discussion, higher education, compulsory attendance, replacement task.*

EVALUATING A BOARD GAME INTERVENTION FOR PARENTAL INVOLVEMENT IN TEACHER EDUCATION

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Abstract
Parental involvement (PI) is widely recognized as a key factor in students' academic achievement, motivation, and social development. Teachers frequently interpret parental involvement primarily as a mechanism for control or problem-solving, rather than as a form of partnership based on shared responsibility and mutual trust. Traditional teacher education programs often struggle to influence these deeply embedded professional beliefs, highlighting the need for innovative, experience-based learning approaches. This study investigates the impact of a purposefully designed analogue board game as a pedagogical innovation for developing partnership-oriented attitudes toward PI among teacher trainees and teachers in Hungary. The intervention was implemented in teacher education courses and in-service programs using a quasi-experimental pre–post design. Based on anonymous identifiers, 31 matched pre–post responses were included in the analysis (17 teacher trainees and 14 practicing teachers). The instrument consisted of 70 items measured on a 10-point Likert scale. As normality assumptions were violated for most difference variables, Wilcoxon signed-rank tests were used to assess pre–post changes. The board game intervention resulted in positive attitudinal changes regarding parental involvement, particularly among practicing teachers. Participants increasingly perceived supporting parents and fostering school–family cooperation as part of teachers' professional responsibilities. A significant improvement was observed in the overall responsibility scale, with stronger effects among practicing teachers. Findings indicate that the board game-based intervention contributed to meaningful positive shifts in attitudes toward parental involvement, particularly among teachers. Participants increasingly perceived PI as a shared

professional responsibility and showed greater appreciation for parents' roles in school-level activities and decision-making processes. Changes were more pronounced in relation to primary education, while involvement in secondary schooling remained less valued. Teacher trainees demonstrated more limited attitudinal change, suggesting that professional experience plays an important role in reflective learning within game-based environments. The results highlight the potential of board games as an innovative pedagogical tool for addressing relational and value-laden dimensions of teaching that are often neglected in formal training programs. The study contributes empirical evidence on how board games can support partnership-oriented approaches in teacher education.

Keywords: *Parental involvement, teacher education, board game, pedagogical innovation, intervention.*

BUSINESS STUDIES TEACHERS' PERSPECTIVES ON ENTREPRENEURSHIP SKILLS DEVELOPMENT IN SOUTH AFRICAN HIGH SCHOOLS

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Abstract
Entrepreneurship education has been positioned in South Africa as a response to persistent youth unemployment and as a means of building learners' agency, creativity and problem-solving skills. In the Curriculum and Assessment Policy Statement (CAPS), Business Studies is expected to contribute to this agenda by developing entrepreneurial competencies rather than only transmitting theory. The study reported herein explored how Business Studies teachers perceive and implement Business Studies as a vehicle for entrepreneurial skill development in Grade 10-11 classrooms. It focused on the pedagogical strategies teachers use, the constraints they experience and the extent to which classroom practice aligns with experiential learning expectations. The study was framed by Kolb's Experiential Learning Theory and adopted an interpretivist qualitative design. Four Business Studies teachers were purposively selected from two secondary schools in the Johannesburg West District, Gauteng, representing a township school with limited resources and a well-resourced urban school. For analytical purposes, two teachers were classified as novice teachers and two as experienced teachers based on the years of teaching experience reported in this study. Data was generated through semi-structured interviews and were analysed thematically. Findings show that teachers understand entrepreneurship education to empower learners to identify opportunities, plan and budget, build confidence, and develop leadership through collaborative tasks. Teachers reported using group discussions, case studies, role-play, business-plan activities and small school-based ventures. However, teaching remained largely theoretical and examination-driven due to curriculum pacing pressures, limited time, overcrowded classes, and uneven access to resources. When interpreted through Kolb's cycle, learners were perceived to engage mainly in abstract conceptualisation, with fewer opportunities for concrete experience and active experimentation. The paper argues that strengthening entrepreneurship education in Business Studies requires feasible experiential tasks, teacher development focused on practical pedagogies and stronger school-community support.

Keywords: *Entrepreneurship education, business studies, experiential learning, teacher perspectives, South Africa.*

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FROM ABSTRACTION TO INTERACTION: A CROSS-NATIONAL STUDY ON STUDENT EXPECTATIONS FROM VIRTUAL REALITY-BASED QUANTUM MECHANICS EDUCATION

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Abstract
Quantum Mechanics (QM) is considered to be one of the most demanding subjects in the undergraduate physics curriculum due to the abstract mathematical formalism on which it relies and its departure from the intuition that students develop from everyday experiences. In response to these challenges, Virtual Reality (VR) has, on numerous occasions, been suggested as the medium to support STEM education. Nevertheless, the question of what students actually expect from VR-based QM learning environments has received limited empirical attention with most of the available evidence drawn from single-country studies. The present work draws qualitative data from university students (N=247) across five European countries (Cyprus, Greece, France, Finland, and Croatia). Specifically, three open-ended questions were analysed using the Reflexive Thematic Analysis approach in its deductive application, operationalised through keyword-based pattern matching against thirteen pre-defined categories. The key findings suggest that students ask for real-world contextualisation, concrete examples drawn from everyday life, as well as opportunities to visualise and interact with quantum phenomena in immersive settings. Furthermore, certain cross-national and gender-based differences were identified which indicate the need for culturally responsive instructional design. Based on the findings, a concrete set of design priorities for the next generation of immersive QM learning tools is provided.

Keywords: *Virtual Reality, quantum mechanics education, student needs analysis, physics.*

SUPERVISING AT SCALE: A COHORT-BASED MODEL INTEGRATING PEER AND SELF-ASSESSMENT IN POSTGRADUATE EDUCATION

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Abstract
The massification of higher education and South Africa's performance-based funding framework have intensified pressures on postgraduate supervision. Increasing enrolments, combined with institutional expectations for improved throughput rates, have significantly increased supervisors' workloads and exposed the limitations of traditional one-to-one supervision models. These challenges call for innovative and contextually responsive approaches to postgraduate supervision. This paper examines an alternative model that combines cohort-based supervision with structured peer and self-assessment practices to support sustainable and transformative postgraduate education. The study employed a qualitative reflective research design. The cohort consisted of five students enrolled in the Master of Education degree on a part-time basis. Data were collected through reflective supervision journals, peer-review artifacts, and observations of engagements during the sessions held twice per month over a year. A thematic analysis was used, guided by the Community of Practice (CoP) theory. The study demonstrated that the cohort model fosters a community of practice in which postgraduate students engage in shared learning, collaborative critique, and collective knowledge production. Combining structured peer and self-assessment processes within the cohort model encourages students to critically engage with their own work and that of their peers, fostering reflective scholarship, academic accountability, and research confidence. Drawing on practical experience implementing this model, the paper concludes that the collaborative supervision approach can support both student development and supervisory sustainability. By distributing aspects of feedback and scholarly dialogue across the cohort, the model not only alleviates supervisory pressures but also challenges hierarchical structures traditionally associated with postgraduate supervision promoting a more effective

learning environment. Furthermore, the cohort approach aligns with broader transformation and decolonial agendas in South African higher education by promoting participatory, dialogic, and inclusive forms of knowledge production. Consequently, the paper argues that integrating cohort learning with peer and self-assessment offers a viable strategy for supervising postgraduate students at scale while maintaining academic quality. Such approaches are increasingly necessary for navigating the intersecting demands of massification, throughput imperatives, and epistemic transformation in contemporary higher education.

Keywords: *Cohort-based learning, collaborative learning, community of practice, peer assessment, self-assessment.*

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PROJECTS AND TRENDS

FROM TRANSPARENCY TO ACCOUNTABILITY: A FRAMEWORK FOR ETHICAL AND EMPOWERING USE OF GENERATIVE AI IN HIGHER EDUCATION

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Abstract
The integration of Generative Artificial Intelligence in higher education marks a pivotal moment in redefining academic practice. While early responses often focused on restriction and detection, emerging evidence suggests that empowering educators and learners through ethical frameworks yields more sustainable and reflective engagement. This paper presents a five-part pedagogical framework, Transparency, Human–AI Collaboration, Contextualised AI Literacy, Institutional Responsibility, and Accountability-Based Assessment, designed to guide responsible GenAI adoption in teaching, learning, and research. Drawing on pre- and post-workshop survey data collected from academic staff at the University of Malta, the study examines shifts in educators' attitudes, confidence, and ethical reasoning following structured GenAI literacy interventions. Findings reveal significant increases in reflective use, transparency in disclosure, and openness to assessment reform when supported by clear institutional guidance. Two new recommendations, Reflective Transparency and Accountability Over Avoidance, extend the framework to emphasise that learners should be evaluated not for AI use itself, but for their capacity to justify, verify, and critically engage with it. The paper argues that the future of higher education lies in moving from prohibition to participation, from automation to co-agency, and from compliance to ethical creativity. By embedding these five guidelines into curricula and policy, institutions can transform GenAI from a disruptive challenge into an instrument of empowerment, scholarship, and integrity.

Keywords: *Generative AI, academic integrity, ethical pedagogy, assessment reform, AI literacy.*

MODELS OF INTERACTION BETWEEN LIBRARY EDUCATION AND LIBRARY RESOURCES IN THE CONTEXT OF DIGITAL TRANSFORMATION

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Abstract
This report examines the theoretical and applied aspects of the interaction between library education and library resources in the context of contemporary digital transformation. It analyzes the main models through which digital technologies change the structure, content, and methodology of library science education, as well as the ways students and faculty use library resources in the learning process. The study emphasizes the role of digital platforms, electronic catalogs, virtual libraries, and open educational resources as tools for modernizing teaching practices and promoting information literacy. Examples of successful integration models are presented, achieving synergy between academic teaching, scientific knowledge, and access to digital resources. In conclusion, it underscores the importance of the strategic use of digital technologies for developing competencies related to critical thinking, information management, and professional adaptability in the library environment. The report offers an analytical perspective on opportunities for sustainable development of library education through effective interaction with digital library resources.

Keywords: *Library education, digital transformation, library resources, information literacy, open educational resources.*

EMOTIONAL RELEASE IN DIGITAL LEARNING SPACES: INTEGRATING SEDONA-INSPIRED PRACTICES INTO ELEARNING PLATFORMS FOR STUDENT WELL-BEING

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Abstract
The proliferation of online education post-COVID-19 has amplified emotional challenges such as anxiety and isolation among learners, necessitating innovative interventions to enhance well-being in digital spaces. This paper proposes an exploratory model for integrating Sedona-inspired emotional release techniques—focusing on awareness, acceptance, and letting go—into eLearning platforms like Moodle, with adaptable low-tech and high-tech (e.g., VR/AR) modules to foster resilience without disrupting academic workflows. Grounded in established theories including Gross's Process Model of Emotion Regulation, Pekrun's Control-Value Theory, and Self-Determination Theory, the framework hypothesizes potential reductions in anxiety and improvements in engagement; however, confirmatory trials are essential, as current evidence remains exploratory. Drawing on a logic model of presumed mechanisms and preliminary data from a small-scale case study (n=15 online learners), the approach demonstrated an exploratory 25% mean reduction in State-Trait Anxiety Inventory scores (Hedges' g_rm=1.66, 95% CI [0.95, 2.37]), alongside 18% increased session engagement, though subject to selection bias and limited generalizability. The study outlines methodological rigor, including stratified randomization, mixed-effects modeling, fidelity monitoring, and CONSORT-EHEALTH compliance, while addressing ethical safeguards for psychological risks and data protection. By advocating scalable, inclusive tools, this work contributes to the discourse on holistic digital education, urging multi-site replications to validate its potential in diverse cultural contexts and bridge gaps in emotional support for remote learning.

Keywords: *eLearning, student well-being, emotion regulation, anxiety reduction, Sedona Method.*

FUNCTIONS OF THE SCHOOL AS A SPACE FOR PRESERVING ETHNOCULTURAL IDENTITY IN A FOREIGN ENVIRONMENT (ASPECTS OF THE WORK OF THE BULGARIAN SCHOOL IN CYPRUS)

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Abstract
The first mass migrations of Bulgarians date back to the period of Ottoman rule in the 17th century, continuing in the 19th century in two directions: northwest (present-day Austria, Hungary, and Romania) and northeast (present-day Russia, Moldova, and Ukraine). In the 20th century, Bulgarian migration was directed towards Central and Western Europe, South and North America. Migration processes were particularly intense after the changes in 1989, with Bulgarian communities now found in various countries and continents. In Bulgarian academia, emigration is usually divided into two groups: historical and contemporary, with the latter including emigration after 1989, which is also referred to as new emigration. One of the defining characteristics of this new emigration is the organisation and development of separate schools in the host country. The example of Bulgarian emigration to Cyprus is indicative of the approaches applied in schools, which, on the one hand, preserve the ethno-cultural identity of the community, but also facilitate the community's more immediate adaptation to the host country. The focus on two of the ten schools is not accidental. One school is located in the capital Nicosia, the other in the smaller town of Paralimni. A comparison between the programs and initiatives of the two schools highlights the importance of creating a cultural space as a place for expression, preservation, and development of ethnocultural identity. An important factor in the development of the schools is that their development is supported by Bulgarian organizations: in Nicosia, this is the Union of Bulgarians in Cyprus, and in Paralimni, it is the Bulgarian Cultural Association "Atanas Shabanov." This, in turn, further establishes schools abroad as cultural spaces for the expression of ethnocultural identity in a foreign environment.

Keywords: *Contemporary emigration, school, culture, identity, Bulgarian emigration to Cyprus.*

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ATTITUDES AND OPINIONS OF PRESCHOOL EDUCATORS AND ELEMENTARY SCHOOL TEACHERS REGARDING ECOLOGICAL EDUCATION AND THEIR AWARENESS OF SUSTAINABLE DEVELOPMENT

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Abstract
The aim of this research paper is to examine the attitudes and opinions of preschool educators and elementary school teachers regarding ecological education and their awareness of sustainable development. The research is based on both qualitative and quantitative analysis of data collected through questionnaires and interviews with teachers from various educational institutions. The objectives of the research are to determine: The attitudes of teachers towards ecological education; The level of environmental awareness among teachers; The presence and method of integration of environmental content into the educational process; The needs for additional training and resources for the successful implementation of ecological education. A descriptive methodology was applied, using surveys and semi-structured interviews as the main research techniques. The target population includes educators working in public and private preschool institutions and elementary schools (grades I–III) across several municipalities in the Republic of North Macedonia. The sample consists of 50 preschool educators and 50 elementary teachers (grades I–III). The sample was selected using purposive sampling, in order to include respondents with various levels of experience, institutional affiliation, and geographical distribution (urban/rural). The results indicate that the majority of teachers recognize the importance of ecological education and its role in building environmental awareness among children from an early age. However, differences exist in the level of engagement, availability of resources, and institutional support. Elementary school teachers tend to have more theoretical knowledge than preschool educators, whereas preschool educators possess more practical knowledge than elementary school teachers. This can be explained by the fact that the knowledge gained by elementary school teachers during university studies is relatively new and limited in practical application, as they spend less time with children during applied coursework. In conclusion, the paper emphasizes the need for more systematic teacher training, integration of environmental topics into curricula, and the promotion of active learning approaches for sustainable development from an early age.

Keywords: *Ecological education, sustainable development, teachers, preschool age, elementary school teachers, environmental awareness.*

SUSTAINABLE EDUCATION IN WRITTEN HERITAGE CONSERVATION: INCORPORATING ENVIRONMENTAL PRACTICES INTO STUDENT TRAINING

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Abstract
Contemporary education in the conservation and restoration of written heritage requires not only technical skills but also awareness of environmental responsibility and sustainability. This report presents approaches for integrating sustainable practices into student training, aiming to develop professionals capable of preserving archives, manuscripts, and rare books with minimal environmental impact. Key elements include the use of eco-friendly materials, energy-efficient storage conditions, safe conservation methods, and the implementation of digital technologies for monitoring and documentation. The training combines theoretical lectures, hands-on workshop experience, and project-based assignments, enabling students to apply sustainable methods in real conservation projects. The report will discuss the educational benefits, scientific challenges, and opportunities for scaling the approach to other curricula and institutions. The goal is to demonstrate how sustainability can become a central component of the educational process, fostering environmental thinking, critical approaches to heritage preservation, and professional ethics.

Keywords: *Education, conservation, written heritage, environmental strategy.*

LITERATURE ANALYSIS ON THE APPLICATION OF MACHINE LEARNING ALGORITHMS FOR THE PREVENTION OF UNIVERSITY DROP OUT

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Abstract
Education is a fundamental human right, established by international agreements such as the Sustainable Development Goal 4, which promotes an inclusive and quality education. In Mexico, upper secondary and tertiary education exhibit the highest student dropout rates, adversely impacting social equity, employment opportunities, economic development, and the sustainability of educational institutions. In response to this challenge, machine learning, artificial intelligence, and deep learning techniques have emerged as relevant tools for the early prediction of student dropout and the development of more effective retention strategies. The aim of this study was to systematically analyze recent literature on predictive models applied to dropout in higher education, identifying the most effective algorithms and the key factors influencing the phenomenon. The methodology followed the PRISMA framework for systematic reviews. Searches were conducted in the Scopus and Web of Science databases covering publications from January 2020 and April 2025. After removing duplicate records, applying JCR indexing criteria, and assessing thematic relevance, 45 high-impact studies were selected. The data were subsequently organized and analyzed using tabular and graphical tools in RStudio. The results indicate that the most effective algorithm is Random Forest, particularly when combined with balancing techniques such as SMOTE Tomek Links, achieving performance metrics above 99%. The most influential factors were found to be current academic performance variables, followed by socioeconomic and admission factors. The analysis confirms the feasibility of implementing predictive models in higher education to reduce student dropout, providing to academic administrators valuable information to target support measures and enhance the efficiency of the educational system. In the specific case of a private institution such as the Universidad Popular Autónoma del Estado de Puebla (UPAEP), implementing the most effective dropout prediction algorithm would have a positive impact by enabling early and personalized interventions for at-risk students, helping them overcome academic, financial, or emotional challenges, and promoting their retention and academic success. Faculty members would have better tools to identify and support at-risk students, strengthening academic support. These actions are expected to significantly reduce dropout rates, optimize institutional resources, and reinforce the university's academic reputation.

Keywords: *University dropout, predictive factors, machine learning, prediction models.*

TEACHING WITH TECHNOLOGY: LECTURER CHALLENGES IN ADOPTING AI TOOLS FOR STEM

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Abstract
This paper examines the challenges lecturers face when adopting Artificial Intelligence (AI) tools in STEM teaching at a South African private higher education institution. Using qualitative secondary analysis of interview, observation, and focus group data from a Master's study, the research re-analyses lecturers' experiences through Rogers' Diffusion of Innovation (DOI) theory. The findings identify key interrelated barriers, including student misuse, unreliable infrastructure, coding inaccuracies, academic integrity concerns, limited training, cautious lecturer attitudes, and increased workload. These challenges map onto DOI attributes, relative advantage, compatibility, complexity, trialability, and observability, highlighting that AI adoption is shaped primarily by systemic and institutional conditions rather than individual resistance. The study argues that sustainable AI integration in STEM requires reliable infrastructure, discipline-specific professional development, and clear ethical guidance, and offers contextually relevant recommendations for higher education.

Keywords: *Artificial intelligence, STEM education, diffusion of innovation, higher education, lecturer adoption.*

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THE TEACHER AS A CONSOLIDATING FACTOR IN THE CONTEMPORARY BULGARIAN DIASPORA

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Abstract
The Bulgarian legislative system establishes teachers as a key factor in shaping individuals. Additional requirements for their training and qualifications are also specified, with certain pedagogical skills being required in addition to basic training. The development of education in the Bulgarian diaspora provides an interesting example of the role of teachers in society. This concerns the formation and development of the contemporary (new) Bulgarian diaspora, whose profile shows different motivations for leaving their homeland, as well as additional intentions to return in the future. Of interest is the reception of teachers among the Bulgarian diaspora in Cyprus, where, in addition to their didactic functions, teachers—as the examples show—prove to be key factors for inter-dialogue (community-host country), for maintaining identity through continuous participation in systems of ongoing qualification (the country of origin), as well as through involvement in additional organizational tasks. Since schools abroad, like those in Cyprus, are designated as Saturday-Sunday schools, the principals are also teachers at the school, mainly in the humanities. At the same time, they also have an additional profession, depending on the situation in the host country. Thus, schools abroad are run by a teacher who, in addition to organizing the educational process – attracting students, developing curricula, selecting additional teachers, ensuring contact with the responsible institutions in Bulgaria – also acts as a key figure in the Bulgarian community, who performs the main tasks for its consolidation.

Keywords: *Contemporary emigration, new emigration, teacher, Saturday-Sunday schools, identity, holidays*.

HYPER-REALISTIC AVATARS IN EDUCATION: A SYSTEMATIC REVIEW FOR HYPER-REALISTIC AVATAR DESIGN IN EDUCATION

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Abstract
Instructor presence remains a widely researched topic in pedagogy, yet findings are mixed across studies that examine both human instructors and human-like virtual avatars. In videos featuring human instructors, several analyses report no reliable gains in learning and, in some cases, heightened cognitive load, although learner motivation tends to increase (Alemdag, 2022). By contrast, research on virtual instructors indicates modest benefits: across multimedia settings, pedagogical agents are associated with minor average improvements in learning (Castro-Alonso, 2021). In immersive virtual reality, human-like avatars have been shown to enhance retention, transfer, and social presence, with cognitive load largely unchanged (Zhang, 2025). Even within a single medium, however, effects can vary considerably. A key gap concerns the extent to which results generalize between studies of human instructor presence and studies of virtual avatars. As hyper-realistic avatar creation platforms become increasingly accessible, bridging this gap is essential to determine how insights from both literatures can inform the design of educational content. This study presents an umbrella synthesis of existing reviews spanning instructor types (human and virtual), delivery platforms (image, video, and virtual reality), stylistic features (talking head and full body), and instructional roles (instructional tutor, mentor, and demonstrator). It provides a comprehensive synthesis of the pedagogical and cognitive theories pertinent to evaluating instructor presence, together with a review of the evaluation methodologies employed in the literature. Practical recommendations are offered on when and how to include instructors across modalities for educators and instructional designers. Finally, the study identifies gaps in the evidence base to motivate future research in this field.

Keywords: *Educational avatars, pedagogical agents, generative artificial intelligence, educational videos, virtual reality.*

A COMPARATIVE ANALYSIS OF AI MODELS FOR SCENARIO-BASED LEARNING

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Abstract
Scenario-Based Learning (SBL) is a pedagogical approach that situates learners within realistic narratives to promote skill transfer, decision-making, and contextual understanding (Clark, 2012). With the rise of generative artificial intelligence, Large Language Models (LLMs) have become central to enhancing SBL by enabling adaptive dialogue, dynamic narrative generation, and personalized feedback (Liu, Yang, & Xu, 2023; Zhang, Wang, & Li, 2024). This paper presents a comparative analysis of LLM applications in SBL across immersive (VR/digital) and non-immersive (text-based and 2D) environments, focusing on education and safety training domains. The study incorporates a review of SBL literature and evaluation frameworks, highlighting how learning outcomes, engagement, and realism are assessed in current research (Lee, Park, & Kim, 2024; Kim & Torres, 2023). We also examine design processes underpinning SBL systems, including human-centered design, iterative prototyping, and collaborative scenario development with educators (WHO, 2022; Ahmed, Brooks, & Liu, 2023; Hu & Chan, 2025). Findings from recent studies (Liu et al., 2023; Rajputh, Seetharam, & Balasubramanian, 2019) indicate that LLM-driven systems support high levels of psychological fidelity and learner engagement, particularly in dialogue-rich contexts, though challenges such as prompt control and response reliability persist (Zhang et al., 2024). Finally, through this paper we aim to conclude that the most effective SBL implementations are built on hybrid AI architectures that combine the creativity and adaptability of LLMs with the precision and structure of rule-based or knowledge-driven components. Such hybrid designs enable educators to maintain control over content accuracy while benefiting from AI-driven flexibility. Additionally, robust evaluation frameworks that systematically assess learning outcomes, engagement, and realism are crucial to ensure both educational effectiveness and technical reliability. Together, these strategies provide a pathway toward developing realistic, adaptive, and safe learning environments powered by AI (Lee et al., 2024; Kim & Torres, 2023; Ahmed et al., 2023).

Keywords: *Scenario-Based Learning (SBL), Large Language Models (LLMs), virtual reality, educational technology, adaptive learning, human-centered design.*

EXPLORING THE IMPLEMENTATION OF SUPPORT SERVICES IN ENHANCING TEACHERS' INCLUSIVE PEDAGOGICAL PRACTICES

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Abstract
Effective implementation of support services depends on the enhancement of inclusive teacher pedagogies. However, principles of the medical model predominate traditional teacher pedagogies hence a need for teacher training that promotes inclusive practices. This study aimed at exploring teachers' pedagogical practices for effective support provision within mainstream schools. Using a qualitative approach in an interpretivist paradigm we employed a case study design to collect data through lesson observations and semi-structured interviews, from 8 teachers and 6 school leaders (Head of department, deputy principal and school principal) in two South African mainstream schools who were purposively sampled [7 participants from each school]. Data was analysed using thematic data analysis because it provides a flexible yet rigorous approach for identifying, analysing, and interpreting patterns of meaning within qualitative data. The findings revealed that the 1) inequitable classroom engagement inhibits inclusive pedagogical practices; 2) multigrade classroom intensifies the complexity of inclusive teaching and 3) the effect of insufficient in-service training and monopolised leadership roles on support provision. Significance of this study is on how systemic collaboration or lack thereof affects improved pedagogical practices and inclusive learning outcomes.

Keywords: *Inclusive practices, pedagogical practices, support services.*

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LANGUAGE EDUCATION: CULTURAL MEDIATION THROUGH CREATING AN IMAGE OF THE FOREIGN COUNTRY

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Abstract
An important part of language education is the development of students' intercultural competence, as attested also by relevant international methodical documents, such as the Common European Framework of Reference for Languages. Such a competence includes the use of the sociolinguistic dimension of communication and suggests the presentation of imagological discursive types of text in the language acquisition process. As a result of the recent national Slovak school curriculum reform in the area of language education, possibly two foreign languages have been established in state schools as early as at the first stage of primary education. At the same time, according to respective national methodical documents, foreign language teaching should emphasize the context of intercultural mediation from the lowest language levels onwards. Therefore, we decided to examine selected Italian language textbooks for foreigners, published by Italian editors and widely used in the Slovak primary and high schools at language levels A1-B1, with the aim to identify the methods and discourse used to create an image of Italy, its culture, and its identity. Using the literary methods, we determined the types of texts presented and described the use of cultural stereotypes and cultural confrontations in relation to stereotyped national identity to create an image of a given country. We proceed from the assumption that the basic and valid strategy of imagological creation is to integrate into the language some precise conceptual ideas that are characterized by key words. Therefore, we pay particular attention to the vocabulary and themes of the selected types of text. The result of our research is a set of key themes and words that are used in Italian language textbooks for foreigners as a basis for creating an image of Italian culture.

Keywords: *Cultural discourse, imagology, linguistic vehicle, foreign language.*

ESCAPING THE PATHOGEN: AN EDUCATIONAL ESCAPE ROOM AS AN ASSESSMENT TOOL FOR MICROBIAL PATHOGENESIS SUBJECT IN HIGHER EDUCATION

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Abstract
This study presents the design, implementation, and evaluation of an Educational Escape Room (EER) employed as a summative assessment tool within the Microbial Pathogenesis elective course for the Bachelor's Degree in Biochemistry and Biomedical Sciences. The primary objective was to develop a gamified resource aligned with the principles of the European Higher Education Area (EHEA), facilitating the integration of theoretical and practical contents regarding the emerging pathogen Vibrio vulnificus. The activity was implemented in a 'hall escape' format with a sequential puzzle structure, incorporating tasks based on real laboratory practices such as pathogen isolation, multiplex PCR identification, antibiograms, and virulence factor characterization. Results from the pilot and final implementation demonstrate high student engagement, significant activation of creative thinking, and a positive perception of the activity as an effective, sustainable, and replicable assessment strategy that fosters transversal competencies including teamwork and critical thinking under pressure.

Keywords: *Educational escape room, gamification, higher education, microbial pathogenesis, summative assessment.*

INTEGRATING SUSTAINABLE E-WASTE MANAGEMENT INTO THE SCHOOL CURRICULUM: A RESPONSE TO LIMITED INSTITUTIONAL SUPPORT

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Abstract
The growing demand for integrating technology into education has introduced effective teaching and learning strategies, aligning with the United Nations' Sustainable Development Agenda 2030. The intensifying digitalization of basic and higher education has accelerated the turnover of electronic devices, producing growing stocks of unused, obsolete and broken equipment at schools and education offices. Electronic devices used in education institutions are frequently replaced due to software and hardware upgrades or their short life span. This results in an increased intake of new devices without proper disposal of old or unused ones, leading to a rise in electronic waste (e-waste). A qualitative explanatory case approach was employed to gather data through individual interviews with asset managers or ICT teachers/specialists from four schools, three district offices and one provincial education department on how unused or broken electronic devices are managed or discarded in schools. Despite the health and environmental risks of unsound e-waste handling, findings revealed that there was no institutional plan for sustainable e-waste management. As a result, most institutions store devices for years or hire ad hoc private collectors. Furthermore, there was no support from other educational stakeholders to address this issue. This study showed how policy–practice gaps and resource asymmetries shape disposal behaviours. The implications are that the accumulation of e-waste and the use of unsustainable disposal methods will persist, leading to further challenges. This study therefore proposes a theoretical frame that combines Education for Sustainable Development (ESD) competencies, Institutional Theory (coercive/normative/mimetic pressures), and a Circular Economy/EPR (Extended Producer Responsibility) lens. We recommend (1) embedding e-waste across the curriculum (Grades R–12) with assessable competencies; (2) establishing provincial/district take-back arrangements aligned to South Africa's EPR Regulations; and (3) funded support for under-resourced schools to avoid environmental harm.

Keywords: *Education for Sustainable Development (ESD), e-waste, institutional support, management strategies, school curriculum.*

AI-ENABLED DESIGN PIPELINES AND THEIR IMPACT ON TEACHING PRACTICE

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Abstract
Artificial intelligence is restructuring design workflows by automating tasks that traditionally required substantial human expertise. These changes are accelerating the need for existing design training systems to adapt to new methods since they were developed on the premise of linear processes and manual skill acquisition. This paper presents a review of the current state of AI-assisted design and its impact on teaching practice. A design case is selected to demonstrate in detail how text-based prompts are transformed into visual patterns, digital fabrics, and ultimately digital garments, featuring virtual fittings, still images, and even video outputs, all ready for direct market release. Each part of the process exemplifies a mode of computational delegation that shortens the production time and alters the notion of authorship. While such workflows expand creative reach, they also raise critical questions for educators regarding control, evaluation, and the preservation of human creativity. The review recommends that educators should not be averse to technological changes, but instead, they should integrate programmed reflections on the pros and cons of AI to empower students to use these systems effectively without compromising their creative agency. The paper aims to provide ways for curriculum updating, adaptive expertise development, and designers' preparedness for a rapid professional environment change through analyzing new AI workflows and their impacts on teaching.

Keywords: *AI-enabled design, digital workflow, design education, teaching practice, creative agency.*

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TEACHERS' EXPERIENCES CREATING TEACHING MATERIALS AS A TOOL FOR TEACHERS' LITERATURE TRAINING

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Abstract
Help students develop into future teachers who are prepared to take learners' needs into account. Provide innovative teaching and learning resources as part of the professional development requirements for student teachers. The scarcity of reading materials is one of the biggest issues in many rural and township communities. It is challenging for teachers to establish a productive learning atmosphere when this is the case. Every learner should have access to all the books and resources necessary to spark their interest in reading. In cases where reading resources are scarce, teachers ought to produce as many of them as they can. Therefore, to educate teachers for their future jobs, instructional material design is essential. The purpose of this study was to evaluate teachers' proficiency in creating resources. Fifty B.Ed. Foundation Phase II second-year students from Central University of Technology's Department of Educational and Professional Studies in South Africa participated in this research. "Participants were purposively selected, and their performance as student teachers was assessed using a marking rubric and structured classroom observations. To create their own Big Book, students were told to see videos on YouTube that demonstrated the process. The creative idea generation from the YouTube technique was explained to students, showing them how to use it and enhance students' creativity for their idea generation. The results of the study demonstrated that using YouTube video technique helped students generate creative ideas to design a big book for future use. This means that instead of depending on the Department of Education's reading materials, student teachers should be encouraged to create their own to promote and improve future teaching-learning outcomes and make learning more engaging and pleasurable for learners. To prepare students for the workforce, the new study suggests that higher education institutions' instructors should foster a culture that encourages critical thinking, greater research, and creative thinking. The suggestion is to include opportunities for creativity in the lessons one teaches: To create their own Big Book, students were told to see videos on YouTube that demonstrated the process. The first step in this research was creating a marking rubric for each student to assess their level of creativity. The researcher in this study employed a statistical strategy to analyze quantitative data. It was discovered that most students could create books and other educational materials; some of them had trouble finishing large books for a variety of reasons. This means that instead of depending on the Department of Education's reading materials, student teachers should be encouraged to create their own to promote and improve future teaching-learning outcomes and make learning more engaging and pleasurable for learners. To prepare students for the workforce, the new study implies that higher education institutions' instructors should foster a culture that encourages critical thinking, greater research, and creative thinking. The suggestion is to include opportunities for creativity in the lessons one teaches.

Keywords: *Big Book, experiences, foundation phase students, student teachers, teaching materials.*

LET ME SHOW YOU SOMETHING – NOTIONS OF VIDEO-BASED ASSIGNMENTS IN UNIVERSITY

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Abstract
As video-based communication becomes an increasingly prevalent mode of expression in professional and academic contexts, higher education faces the challenge, and opportunity, of integrating multimodal production into its pedagogical practices (Navarrete et al. 2025). This paper examines master's students' experiences in a university-level course where two group assignments were completed and submitted in the form of short videos. Each group consisted of three students, collaborating to design, script, record, and edit their work. The study explores how students initially received the video-based assignment format, how they navigated the process of creating the videos, and how they reflected on the experience afterward. Drawing on students' reflections, in-class discussions, and observations collected during the project period, the analysis reveals a trajectory of their perceptions. The findings are triangulated through a questionnaire

in the next few weeks. At the outset, students are expected to express uncertainty, some regarding their technical skills, others the perceived ambiguity of creative tasks compared to traditional written assignments. Despite this initial hesitation, groups quickly developed working norms and distributed roles and tasks, maybe according to individual strengths, indicating that video production naturally encouraged collaboration, negotiation, and peer support (Campbell & Cox, 2018; DeLange, 2020). Whilst at least partly having a good time. During the production phase, students are also expected to report a heightened sense of engagement and ownership. The performative nature of video prompted deeper internalization of content, as groups sought to communicate ideas clearly and compellingly. The iterative process of scripting, recording, and editing further required students to agree upon the central concepts and make deliberate mutually agreed design choices, fostering critical reflection on the subject matter. Challenges, such as time management, diverging creative visions, and technical constraints, are likely to have emerged as meaningful learning moments as well as hindrances along the way. Post-assignment reflections are anticipated to show that students valued the authenticity and variety introduced by video-based assessment. There may be feelings of accomplishment and format enabled expressions of insight and creativity that written submissions often constrain. Students have indicated that the assignments felt more aligned with the communicative demands of contemporary working life, increasing the perceived relevance of the course. The findings suggest that short video assignments can enrich learning by promoting collaboration, creativity, and conceptual understanding. The paper concludes with recommendations for instructing video-based tasks that balance structure and openness, support equitable participation, and support students' technical and creative development.

Keywords: *Video-based assignments, university assignments, student supporting.*

THE MEDIATING ROLE OF MISCONCEPTIONS IN BLENDED LEARNING'S IMPACT ON 3D TRIGONOMETRY ACHIEVEMENT: A STRUCTURAL EQUATION MODELLING STUDY

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Abstract
This study examines the mediating roles of conceptual understanding (CU) and misconceptions (ME) in the relationship between blended learning (BL) and academic achievement (ACH) in Grade 12 three-dimensional (3D) trigonometry. Grounded in social constructivism, an explanatory sequential mixed-methods design was employed, integrating structural equation modelling (SEM) with qualitative interviews and classroom observations. Data were drawn from 381 learner scripts and a focal sub-sample of 30 students and three teachers in South African public schools situated within the Chris Hani West District. Quantitative results confirm that BL positively predicts conceptual understanding ($\beta = 0.32$) and academic achievement ($\beta = 0.25$), while negatively predicting misconception ($\beta = -0.21$). Conceptual understanding reduces misconceptions ($\beta = -0.40$) and enhances academic achievement ($\beta = 0.35$), with misconceptions negatively impacting performance ($\beta = -0.28$). Bootstrapped mediation analysis identifies significant indirect effects of blended learning on academic achievement through conceptual understanding ($\beta = 0.11$) and misconceptions ($\beta = 0.06$), and via a serial pathway via conceptual understanding → misconceptions → academic achievement ($\beta = 0.10$). Conceptual errors accounted for 65.70% of learner scripts. Qualitative triangulation confirms that dynamic visualisations, dialogic tasks, and formative feedback are most effective in disrupting persistent error patterns. The study argues that blended learning, when strategically designed to target misconceptions, improves conceptual mastery and, by reducing errors, indirectly boosts achievement. Findings offer actionable instructional design principles for STEM education in resource-constrained settings.

Keywords: *Blended learning, misconceptions, 3D trigonometry, mathematics achievement, structural equation modelling.*

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GENDER DISPARITIES IN STEM DEGREES: EVIDENCE FROM HIGHER EDUCATION AND LABOR MARKET

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Abstract
The growing demand for highly qualified professionals in science, technology, engineering, and mathematics (STEM) has intensified concerns about persistent gender inequalities along educational and professional pathways. Despite sustained policy efforts, significant gender gaps remain in STEM education, particularly in engineering and information and communication technologies (ICT), with direct implications for labour market outcomes and wage structures in the technology sector. Understanding the drivers of these disparities is essential for designing effective interventions. This study examines gender inequality across the STEM pipeline, linking higher education choices to labour market outcomes, with a specific focus on ICT-related fields. First, a descriptive analysis is conducted using secondary data to assess gender gaps in STEM degrees at the European level, with particular attention to Spain and the Universitat Politècnica de València (UPV). Results confirm a pronounced under-representation of women in STEM programmes, especially in ICT degrees, which cannot be explained by differences in academic performance. Second, to investigate the determinants of students' engagement with STEM studies, an original questionnaire was developed based on an extensive literature review. The survey captures key individual, social, and institutional factors, such as interest, self-efficacy, aspirations, stereotypes, parental support, and teacher encouragement, that may influence STEM educational decisions. The final sample consists of 151 undergraduate students from the Universitat Politècnica de València. Data are analysed using structural equation modelling techniques PLS-SEM, drawing on validated theoretical frameworks. The findings indicate that gender disparities in STEM education translate into unequal participation in the technology labour market, where women occupy approximately 28% of STEM-related jobs in Spain, and less than 20% of ICT positions. While a gradual reduction in the gender pay gap is observed, occupational segregation remains substantial. The multi-group analysis reveals notable gender-specific effects: parental and teacher support play a more decisive role for women in shaping STEM career aspirations, whereas beliefs about the STEM sector exert a stronger influence on women's interest levels compared to men. Contrary to expectations, some hypotheses, such as the direct impact of gender stereotypes on aspirations, are not significant. Overall, the results highlight the importance of early social support mechanisms and institutional interventions in addressing gender inequality in STEM education and ICT careers, contributing to evidence-based policy discussions aligned with SDG 4 and SDG 5.

Keywords: *STEM career, gender inequality, wage gap, higher education, structural equation modeling.*

INCLUSIVE PRACTICES IN LARGE PRIMARY CLASSROOMS: TEACHER TRAINING AND RESEARCH IN SÃO TOMÉ AND PRINCIPE

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Abstract
Large class sizes remain a major challenge for the implementation of inclusive education, particularly in education systems facing structural constraints and limited resources. This paper presents an education and research project developed in São Tomé and Príncipe, aimed at supporting primary teachers working in large classrooms through inclusive and context-responsive pedagogical approaches. The project is grounded in an action–training–research framework and seeks to strengthen teachers' capacities to manage diversity, promote participation, and implement pedagogical differentiation in real classroom contexts.

It is structured in interconnected phases: contextual diagnosis, teacher training workshops, collaborative reflection, and the progressive implementation and monitoring of inclusive practices. This paper focuses on the initial diagnostic phase, conducted over a short exploratory period, which aimed to identify key challenges, available resources, and prevailing conceptions of inclusive and special education. Data were collected through a semi-structured exploratory conversation with five purposively selected educational professionals, chosen for their direct experience in primary education and involvement in local school contexts. Data were analysed using qualitative content analysis following an inductive approach. Findings reveal persistent tensions between inclusive policy discourses and everyday classroom realities, particularly regarding class size, limited support structures, and constraints on pedagogical decision-making. At the same time, participants identified adaptive strategies and situated professional knowledge that can support more inclusive practices. These results are informing the design of context-sensitive training strategies and shaping subsequent phases of the project, including the development of collaborative professional learning spaces, classroom-based experimentation, and iterative monitoring processes. Based on the diagnostic findings, preliminary recommendations are proposed, emphasizing the need for practice-oriented training, peer collaboration, and the valorization of local pedagogical knowledge. This study highlights the role of teacher education and international cooperation in advancing inclusive education in complex and resource-constrained settings. The findings also contribute to a situated understanding of inclusive education in Portuguese-speaking African contexts, highlighting the relevance of contextually grounded professional development approaches.

Keywords: *Inclusive education, large classrooms, teacher training, action research, São Tomé and Príncipe.*

EXPLORING THE ROLE OF ARTIFICIAL INTELLIGENCE IN DESIGN-DRIVEN STARTUP EDUCATION

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Abstract
The growing availability of Artificial Intelligence (AI) tools is reshaping entrepreneurship education, particularly within design-driven approaches to startup creation. While AI is increasingly used to support entrepreneurial activities, there is still limited understanding of how it influences the different phases of the startup creation process in higher education contexts. This paper investigates the role of AI within a design-driven startup education course, where students develop entrepreneurial ideas from opportunity identification to business model definition. The course integrates design methodologies with entrepreneurial and managerial tools, supporting students in navigating uncertainty, feasibility, and strategic decision-making. A structured survey was administered to students to assess the extent of AI usage and its perceived usefulness across key phases of the startup process, including opportunity identification, need analysis, concept development, market exploration, and business model definition. The results show that AI is perceived as particularly useful in early and analytical phases, where it supports information gathering, synthesis, and the exploration of alternative solutions. In these stages, AI functions as a cognitive amplifier, helping students navigate uncertainty and structure complex inputs. However, its perceived usefulness decreases in more strategic and decision-intensive phases, where human judgment, critical thinking, and responsibility become central. These findings highlight a tension between the exploratory potential of AI and its tendency toward risk-averse reasoning. From an educational perspective, this suggests framing AI as a cognitive sparring partner that stimulates thinking without replacing decision-making. The study contributes to the design of startup education models that leverage AI while preserving the uncertainty and risk that are fundamental to innovation-driven entrepreneurship.

Keywords: *Artificial Intelligence, startup education, design education, design-driven entrepreneurship, human–AI collaboration.*

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INSTRUCTIONAL DESIGN IN PRACTICE: CONTRIBUTIONS TO THE STRUCTURING OF ONLINE COURSES FOR WOMEN ENTREPRENEURS

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Abstract
The growth of female entrepreneurship in the context of online education has driven the creation of digital courses as a strategy for sharing knowledge and generating income. However, many female entrepreneurs face difficulties in pedagogical organization, content structuring, and defining effective teaching-learning strategies. In this context, Instructional Design (ID) emerges as a methodology capable of supporting the systematic and pedagogical design of online courses. The present study aims to analyze how the application of Instructional Design contributes to the organization, content development, and definition of teaching-learning strategies in the creation of online courses by women entrepreneurs. Methodologically, the study adopts a quantitative approach, using questionnaires before and after specific training in Instructional Design, aimed at women entrepreneurs with previous experience in digital content production. The results show that the use of Instructional Design principles promotes greater clarity in the definition of objectives, better sequencing of content, and more appropriate choices of pedagogical strategies and technological resources. It is concluded that Instructional Design is a relevant tool for improving the quality of online training developed by women entrepreneurs, contributing to pedagogical effectiveness, the sustainability of courses, and the promotion of female entrepreneurship in the digital context.

Keywords: *Instructional design, online courses, women's entrepreneurship, digital education, teaching-learning strategies.*

DECLARATIVE AND POETIC SYMBOLS IN ART STUDENTS' EXPLORATION OF ENVIRONMENTAL RENEWAL THROUGH LANTHIMOS'S BUGONIA

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Abstract
This paper presents a visual arts project in higher education that engages students' environmental concerns through film-based learning and creative practice. Four published posters from Yorgos Lanthimos's *Bugonia*, designed by Vasilis Marmatakis, functioned as a shared point of departure for examining how ecological crisis can be rendered intelligible through symbolic work, reframing and digital transformation. The enquiry considers what these images communicate with relative directness, while also asking what meanings emerge when publicity material is detached from narrative sequence and encountered as autonomous visual artefacts. The workshop draws conceptually on Bugonia, as described in Virgil's *Georgics* and Pliny's *Natural History*, where bees are said to arise from the carcass of an ox. This image of life emerging from decay is employed as an interpretive lens through which students consider renewal without recourse to idealised notions of repair. Read alongside the film's black-comic premise, the title's classical allusion also brings collective labour, ecological fear and sacrificial logic into view. Within this framework, bees and wings remain legible as signs of pollination, labour and ecological interdependence, while bodily exposure and planetary form register damage, contamination and vulnerability. Students were asked to distinguish between declarative symbols—stable, recognisable and socially legible—and poetic symbols, which operate more indirectly, affectively and with greater openness to subjective interpretation. Working in four groups, students progressed through close observation, discussion, digital intervention and reflective comparison. Their processes included inversion, equalisation, solarisation, layering and compositing, employed to test how visual meaning shifts when familiar signs are displaced without being erased. The transformed posters subsequently became the primary visual material for thematic analysis. Across the outcomes, stable symbols of exposure, planetary fragility and insect life did not disappear; rather, they were reconfigured into denser ecological images in which vulnerability, interdependence and instability became more perceptible. The paper argues that the movement from declarative to poetic symbolism offered students a practical means of reimagining ecological renewal as visually constructed, unstable and more-than-human.

Keywords: *Climate change education, project based learning, visual literacy, poster analysis, Bugonia.*

BETWEEN EXPECTATIONS AND RECOGNITION: PERCEPTIONS OF PRESCHOOL TEACHERS' PROFESSIONAL STATUS AND THE PATH TOWARD TRANSFORMATION WITHIN THE TEACH-MC PROJECT

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Abstract
In the context of contemporary challenges in early childhood education and care (ECEC), this pilot study explores the perceptions of preschool teachers and parents regarding the status of preschool teachers. The aim was to identify key factors shaping its social positioning and to examine differences between key stakeholder groups. The study included 125 participants (59 preschool teachers and 66 parents) from a public kindergarten institution in Rijeka. Data were collected via an online questionnaire using an adapted version of the Status Scale (Šteh, Čepić & Kalin, 2017), piloted on a sample of preschool teachers and parents, with the results informing its refinement for subsequent use within the TEACH-MC Project. Quantitative data was analysed using descriptive and inferential statistical approaches to examine group differences and relationships with key sociodemographic variables. The findings indicate significant differences between the two groups, with preschool teachers perceiving their status as lower, while parents maintain a more favourable view. A notable discrepancy emerges in perceptions of social recognition and respect, suggesting differing expectations and a potential communication gap between stakeholders. Higher levels of education among preschool teachers are associated with more critical perceptions, pointing to a mismatch between increasing professional demands and societal recognition. This study forms part of the TEACH-MC Project (2025–2029) and represents its pilot phase, providing initial findings that inform its further development. The results contribute to the development of evidence-based recommendations aimed at strengthening the status and long-term sustainability of the profession.

Keywords: *Preschool teachers, status, teacher identity, TEACH-MC project, professional development.*

DOES FINNISH EDUCATION SYSTEM MATTER FOR CHOOSING FUTURE CAREER PATH? A COMPARATIVE STUDY AMONG THE EIGHTH GRADERS

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Abstract
The Finnish education system is one of the most effective educational systems in the world. It stands out for its strong emphasis on developing critical thinking and practical skills, as well as for its highly trained teachers and attention to student well-being. All these factors, along with others not previously specified, contribute to providing high-quality education for all students, regardless of their background. Since the world we live in is dominated by constantly evolving technology, students need an education that provides equal opportunities for everyone and helps them prepare for future careers in an unpredictable labor market. This study was motivated by the need to identify the particularities of the Romanian and Finnish education systems and how they influence the career choices of 8th-grade students. The study involved 68 students from two schools in Bucharest. Both schools follow the Romanian national curriculum, but one of them applies practices inspired by the Finnish education system. The purpose of this study was to explore whether Finnish-style education influences the career choices of 8th-grade students. The data for the study were collected using a STEM identity identification tool developed by researchers (STEMI – STEM Identification instrument). The results of the data analysis show that the Finnish education system has clear benefits and influences the way students develop their STEM identity. The study also presents certain limitations, including the small number of students and schools included, as well as the lack of longitudinal data. Finally, recommendations were made for pre-university teachers and educational policymakers regarding the improvement of the education system through the integration of STEM subjects and the implementation of methods and strategies that help students develop their STEM identity.

Keywords: *Finish education, career, eighth grade, Romania, STEM.*

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IMPLEMENTING A STEAM-ORIENTED HANDS-ON CURRICULUM IN GENERAL EDUCATION COURSES

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Abstract
This study was conducted within a general education course at National Taitung Junior College and aimed to design and implement an interdisciplinary, hands-on curriculum grounded in the principles of STEAM (Science, Technology, Engineering, Arts, and Mathematics). Through context-based learning and a design thinking approach, students were guided to integrate scientific inquiry, engineering design, mathematical analysis, and artistic creativity to address real-world problems, thereby fostering creativity, problem-solving skills, and interdisciplinary competencies. The curriculum was structured around thematic activities such as sensor system design, solar-powered vehicles, voice sensing applications, and water rocket system design. These activities integrated sensor applications, data collection and analysis, structural design, and aesthetic expression. Beyond functional implementation, students were encouraged to consider visual design, creative expression, and usage scenarios of their projects. The instructional process emphasized teamwork, iterative prototyping, and reflective revision, enabling students to comprehend abstract concepts through hands-on practice while developing communication and presentation skills through project demonstrations and oral presentations. The research methodology primarily employed a STEAM learning outcomes questionnaire and classroom observations to analyze students' learning interests, knowledge application, reasoning and analytical abilities, and creative performance. The results indicate a positive improvement in students' learning attitudes and engagement across all STEAM dimensions. In particular, students demonstrated significant learning gains in transforming mathematical and engineering concepts into tangible design outcomes and enhancing project completeness and expressiveness through the integration of artistic elements. Overall, the findings suggest that incorporating STEAM-based interdisciplinary practices and artistic design elements into general education courses not only enhances students' understanding of and interest in STEM learning but also contributes to the development of creative practice and real-life application skills. This study provides a practical and replicable model for promoting STEAM education and instructional innovation in technical and vocational higher education institutions.

Keywords: *STEAM education, interdisciplinary learning, general education, design thinking, hands-on learning.*

FUTURES LITERACY AS AN INCLUSIVE CONCEPT

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Abstract
The contribution takes a theoretical and conceptual perspective. First, the learning requirements associated with social innovations and crisis events are examined in order to clarify the challenges they pose for individuals and society. In the next step the concept of Futures Literacy (UNESCO, 2021; 2026) will be introduced, which is considered as a central concept for dealing with complex, uncertain and dynamic situations. However, promoting Futures Literacy presents a number of educational challenges: On the one hand, the future is a difficult subject to grasp. On the other hand, developing future scenarios requires certain skills that some learners have yet to acquire. Since the concept is fundamentally relevant to all people, the article explores the overarching question of the extent to which Futures Literacy is an inclusive approach that also enables disadvantaged individuals to participate in the process of shaping the future. For this purpose, contemporary didactic approaches to promoting Futures Literacy are presented and discussed from an inclusive education perspective.

Keywords: *Didactics, future, futures literacy, future skills, inclusive education.*

EMBEDDING AI LITERACY WITHIN DISCIPLINARY CURRICULUM THROUGH STRUCTURED ASSIGNMENT DESIGN

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Abstract
The rapid expansion of generative and agentic artificial intelligence (AI) in higher education is prompting renewed discussions about curriculum integration, academic integrity, and responsible technology adoption. While institutions debate policy and regulation, a central pedagogical question remains: how can AI literacy be embedded meaningfully within disciplinary coursework rather than treated as a standalone skill or external add-on? This paper explores an instructional design approach that integrates AI directly into structured course assignments while preserving disciplinary rigor. The discussion is grounded in the redesign of a specific undergraduate course assignment, used as a concrete example of discipline-embedded AI integration. Rather than positioning AI as a shortcut or replacement for student effort, the approach reframes AI as a tool that must be evaluated, constrained, and verified within existing learning objectives. In the redesigned assignment, students first demonstrate foundational competency independently before engaging generative AI to extend, analyze, and refine their work. Students document their prompts, test AI-generated outputs, identify inaccuracies, and justify revisions, ensuring that conceptual understanding remains central. The structured integration emphasizes that AI literacy involves understanding system limitations, critically evaluating outputs, and recognizing AI's influence on disciplinary thinking. By embedding AI use within established coursework, curriculum redesign becomes incremental rather than disruptive, allowing faculty to integrate AI without replacing core assignments. The paper will outline the design principles guiding this integration, including scaffolding, productive struggle, and transparent documentation, and will discuss how the model can be adapted across disciplines to support responsible AI adoption in higher education. As generative AI continues to influence academic work, instructional design plays a central role in shaping student engagement with these systems. Embedding AI literacy within disciplinary curriculum offers a sustainable pathway forward that balances innovation with rigor and prepares students to engage critically and ethically with emerging technologies.

Keywords: *AI literacy, curriculum integration, instructional design, generative AI, higher education.*

INVESTIGATING CONTRADICTIONS REGARDING EDUCATION FOR SUSTAINABLE DEVELOPMENT INTEGRATION AMONG ACADEMICS: AN INTERDISCIPLINARY PERSPECTIVE

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Abstract
Education for Sustainable Development (ESD) is recognised as a key approach for addressing complex global challenges through higher education, yet its integration remains uneven across disciplines. A significant barrier concerns tensions surrounding roles and responsibilities for ESD integration, often resulting in fragmented practices. This study explores contradictions emerging in interdisciplinary academics' perspectives regarding ESD integration through authentic conversations in a collaborative Community of Practice. Guided by the research question, *what contradictions emerge in interdisciplinary academics' perspectives regarding the integration of Education for Sustainable Development,* the study draws on Cultural-Historical Activity Theory (CHAT). Focusing on primary-level contradictions within the division of labour, the findings reveal competing assumptions about whether ESD is discipline-specific or a shared responsibility. These tensions are intensified by limited policy visibility and institutional support. The study argues that making such contradictions visible through authentic conversations is essential for coherent and intentional ESD integration.

Keywords: *ESD, CHAT, division of labour, interdisciplinary collaboration.*

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BETWEEN PROTOTYPES PROJECTS AND CREATIVE PROCESSES - EDUCATIONAL ROBOTICS TAKES SHAPE THROUGH THE MAKER CHALLENGE

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Abstract
The integration of Maker Culture and Educational Robotics emerges as a promising pedagogical approach for reshaping teaching practices, shifting the student from a passive consumer to an author and protagonist of their own learning process. The activities developed are primarily aimed at Basic Education teachers and university interns who act as supporters and multipliers of the project, playing a strategic role in technological mediation, peer training, and the sustainability of maker practices in schools. The project starts with the analysis of real problems in the school community and its surroundings, giving social meaning and relevance to the technological solutions developed by the students. The methodology adopted follows the Problem-Based Learning (PBL) model, articulated with Project-Based Learning, so that each maker challenge originates from a concrete problem situation, investigated and transformed into an opportunity for creative intervention through prototyping and automation. The analyzes are predominantly based on Seymour Papert's (1980) constructionism, for whom meaningful learning stems from the construction of shareable artifacts, and on Mitchel Resnick's (2017) perspective on creative learning, structured around projects, peers, and playfulness. Contemporary authors, such as Paulo Blikstein (2013, 2020) and Leo Burd (2016), expand this framework by associating Maker Culture with technological democratization, educational equity, and the development of computational thinking. The methodological structure is organized as a Maker Challenge, comprising: awareness-raising and participatory diagnosis, collaborative ideation, solution planning, prototyping with recyclable materials and open platforms such as Arduino, programming, iterative testing, and socialization of results. The activities are distributed into categories—automata, creative circuits, motorization, programming with Scratch, and automation with sensors—always guided by the appreciation of the investigative and construction process. The assessment, of a formative and continuous nature, prioritizes reflective records, peer collaboration, creativity, and the ability to iterate solutions. It is concluded that the articulation in the project between maker activities and educational robotics constitutes a fertile ecosystem for pedagogical innovation, fostering critical thinking and strengthening links between technology, sustainability, and social participation, especially when mediated by educators committed to authorship and equity.

Keywords: *Maker culture, educational robotics, creative learning, problem-based learning, constructionism.*

"LIFE IS YOUR BLOCK OF CLAY." APPLYING A TYPOLOGY FOR LEARNING IN MAKERSPACES

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Abstract
This paper contributes to identifying the often-implicit learning that minoritized youth do in community-based making in makerspaces and afterschool programs. We apply Tomko and colleagues' (2023) typology for learning in makerspaces to artifact elicitation transcripts from two projects that integrated math/STEM and making with minoritized youth to test its applicability to a younger population and a different setting. The implementation of this typology identifies both how and what individuals learn through making activities and the gaps we find in the framework when applying it to learning in informal spaces. Given that learning through making is often implicit, having the tools to identify it and make it explicit supports the value of learning through making in out-of-school environments for minoritized youth.

Keywords: *Makerspaces, typology for learning, modes of learning, products of learning, artifact elicitation.*

INTERCULTURAL COMMUNICATION AS A CHALLENGE AND AS A TOOL IN MULTICULTURAL ENVIRONMENTS

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Abstract
Today's world is becoming increasingly multicultural, which means the need for new competencies, especially of communication, in both professional and personal environments. Since a person is a social being and one of the essential characteristics of the latter is the need to communicate, cooperate, and be part of a certain society, communication in this context is an integral part of any society and one of the crucial skills of any person. And here it is important not only to know the language of that society, but also to know essential communication strategies, such as the ability to use various non-verbal means of communication, listen and hear what others say, concentrate, engage and participate in a conversation, speak in public, control your tone of voice, etc. These strategies are especially needed in order to reduce as much as possible the noise that exists in any communication process, which, according to communication experts, not only complicates the communication process itself, but can also negatively affect the results of that communication. In addition to the usual types of noise, such as psychological, physical, physiological, etc., today, culturally based communication noise is increasingly being referred to. This means that cultural characteristics have an impact on how the communication message itself is constructed and sent in the communication process, as well as how it is decoded, i.e. how a person belonging to another culture will understand what was said, how they will react to it, etc. And it is not knowledge of the relevant language, but the existing intercultural communication competence that can help them feel good and act constructively and communicate in a multicultural environment. For these reasons, intercultural communication can pose certain challenges in the communication process, but, on the other hand, having intercultural communication skills can be an excellent tool for communication in a multicultural environment. And the communication could be treated as effective context for development intercultural communication skills and competencies, because practice, reflection and experiential learning are the best ways for developing interculturality in general. The article will examine both of these aspects - as a challenge and as a tool - of intercultural communication, based on the experience of the Siauliai State Higher Education Institution in working with national and international students, it will analyse the challenges encountered in communicating in multicultural environments, and ways in which intercultural communication competencies can be developed during formal and informal studies.

Keywords: *Intercultural communication, multicultural environments, communication strategies, higher education, development of intercultural communication skills and competencies.*

DEVELOPING A FRAMEWORK FOR THE INTEGRATION OF EDUCATION FOR SUSTAINABLE DEVELOPMENT INTO SCIENCE TEACHING AND LEARNING

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Abstract
Global efforts to embed Education for Sustainable Development (ESD) into curricula, particularly science education, are gaining traction. Yet research highlights that teachers often lack a clear understanding of sustainability objectives, competencies, and pedagogies. This gap is largely due to the absence of frameworks guiding the integration of ESD into science lessons, to align with the 2030 Agenda for Sustainable Development. To address this, the study developed a practical, comprehensive, and cohesive framework incorporating ESD principles. Using a qualitative conceptual design, the study developed a framework which outlines SDG-specific learning objectives, sustainability competencies, and transformative pedagogies to develop the competences in learners. The framework is expected to strengthen teachers' grasp of ESD and empower them to integrate it in their teaching to cultivate a generation of students equipped to tackle sustainability challenges.

Keywords: *Education, science, ESD, sustainability, framework.*

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CBL PROJECT AND SUSTAINABILITY – SARRIKO SUSTAINABLE: THE CHALLENGE TO REDUCE, REUSE AND RECYCLE

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Abstract
Waste generation and inadequate management represent one of the most pressing environmental challenges of contemporary societies due to their direct contribution to climate change, biodiversity loss, and resource depletion. Higher Education Institutions (HEIs), as complex socio-technical systems characterized by high population density and turnover—including students, faculty, researchers, and administrative and service staff—generate a significant material footprint associated with their academic, research, and operational activities. Within this framework, the University of the Basque Country (EHU) has positioned the 2030 Agenda as a cross-cutting strategic axis, embedding sustainability principles into governance, teaching, research, and knowledge transfer through initiatives such as *EHUagenda2030 for Sustainable Development*. Aligned with this institutional strategy, the Faculty of Economics and Business promotes the collective initiative "SARRIKO SUSTAINABLE: The Challenge to Reduce, Reuse, and Recycle." The project aims to foster a structural transformation in consumption patterns and waste management practices on campus, advancing beyond recycling performance toward waste prevention at source and measurable reductions in overall waste generation, consistent with circular economy and zero-waste frameworks. The overarching objective is to empower students as active change agents through the implementation of the Challenge-Based Learning (CBL) methodology. By integrating experiential learning, systems thinking, and collaborative problem-solving, the initiative seeks to generate feasible, scalable, and impact-oriented solutions. The project incorporates environmental performance indicators and impact assessment mechanisms to support evidence-based decision-making and facilitate the campus transition toward a more sustainable and resource-efficient model.

Keywords: *CBL, EHU, sustainability, climate change, zero-waste.*

A PILOT STUDY ON THE EFFECTS OF INVOLVING THE SECONDARY SCHOOL STUDENTS IN JAR (JUNIOR ACHIEVEMENT - ROMANIA) ACTIVITIES ON THEIR ENTREPRENEURIAL INTENTIONS

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Abstract
In an ever-evolving society, education plays a crucial role in preparing students for successful careers. Beyond the content of the mandatory school subjects, students also need additional knowledge and skills to prepare them for the labor market. Entrepreneurship education plays a significant role in developing entrepreneurial intentions among young people. The pilot study presented in this paper analyzes the effects of involving secondary school students in Junior Achievement Romania (JAR) activities. The study focuses on how participation in JAR programs contributes to changes in students' attitudes toward entrepreneurship, the entrepreneurial skills they develop, and their intentions to start a business. The study included four classes of students from two different schools in Bucharest, Romania. A comparison was made between the two student groups, and data were collected through a questionnaire administered to the students. The results show that Junior Achievement Romania (JAR) activities have a positive influence on changing students' attitudes toward entrepreneurship and on developing their entrepreneurial skills. Furthermore, the data indicates that students exposed to JAR activities exhibit higher self-confidence and show greater interest in starting a business. This pilot study serves as a starting point for future research on this topic and provides teachers and other educational stakeholders with useful recommendations regarding the role and importance of promoting entrepreneurship among young people. However, the study also has limitations, including the small number of students involved and the lack of longitudinal data.

Keywords: *Junior Achievement - Romania – JAR, entrepreneurial education, business education.*

PHYSICAL SCIENCES PRE-SERVICE TEACHERS' VR-SUPPORTED 5E INSTRUCTIONAL PRACTICES DURING MICROTEACHING OF ELECTRON CONFIGURATION

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Abstract
Teaching concepts that are abstract such as electron configuration remain challenging in Physical Sciences classrooms, particularly for pre-service teachers who are still developing their pedagogical and technological competencies. The integration of technology with inquiry-based teaching presents opportunities to support visualisation and strengthen instructional practice. This paper reports the findings of a qualitative case study exploring Physical Sciences pre-service teacher's implementation of a VR-enhanced 5E Instructional Model of Inquiry when teaching electron configuration during microteaching. The study focused on three Physical Sciences Post-Graduate Certificate (PGCE) pre-service teachers that were purposively selected from a South African university. The data was collected using lesson plans, non-participant classroom observations, semi-structured interviews, and stimulated-recall reflections. The findings from the lesson plans and semi-structured interviews indicated that pre-service teachers showed willingness to integrate VR and 5E Instructional Model during their teaching. VR was found to be effective as it promoted learner engagement, visualisation of abstract atomic structures, allowed the exploration and promoted the explanation during microteaching sessions and assisted in grasping the concept that is abstract. Challenges were identified during the implementation of the VR-enhanced 5E Instructional Model during micro-teaching such as limited instructional time allocated per pre-service teacher were not enough, technical difficulties due to lack of training, varying levels of confidence in the use of the VR tool from the pre-service teachers, and difficulties in coherently balancing the integration of all phases of the 5E Instructional Model while also implementing the VR tool. Despite these challenges being raised, the pre-service teachers also reported positive teaching experiences and recognised VR as a valuable tool for supporting inquiry-based teaching in science classrooms. The study recommends the purposeful inclusion of VR-supported inquiry approaches within teacher education programmes. Furthermore, opportunities for VR-based microteaching should be expanded to better prepare PGCE pre-service teachers for real classroom contexts and to strengthen their ability to implement inquiry-based instructional practices in Physical Sciences.

Keywords: *5E Instructional Model,* electron configuration, inquiry-based teaching, Physical Sciences, *Virtual Reality.*

INNOVATIVE TEACHING OF RENEWABLE ENERGY TECHNOLOGIES THROUGH REAL-TIME DATA MONITORING OF MICROGRIDS

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Abstract
This paper presents a virtual laboratory designed to support remote instruction on renewable energy–based microgrids within undergraduate Electrical Engineering programs. The system comprises four 100 Wp photovoltaic panels and a 400 W wind turbine generator. Microgrid data are collected through dedicated acquisition devices and stored in a time-series–optimized database. A Telegram application programming interface (API) enables access to microgrid and weather station data. Student feedback, gathered through a questionnaire, indicates high satisfaction with the virtual laboratory, with an average rating of approximately 4.5 out of 5. Participants strongly agreed that the platform enhanced academic skills and supported the achievement of program learning objectives. Overall, the virtual laboratory significantly improved students' understanding of renewable energy microgrids and constitutes an effective complement to traditional in-person laboratory instruction.

Keywords: *Interactive learning, remote access, telegram bot, graphical user interface, virtual laboratory.*

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NAVIGATING BUSINESS LANGUAGE: PRE-SERVICE TEACHERS' LOTL PRACTICES IN MULTILINGUAL CLASSROOMS

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Abstract
The Language of Teaching and Learning (LoTL) remains a critical mediator of access to curriculum knowledge in multilingual classrooms. In Business Studies, where technical terms and abstract concepts dominate, limited proficiency in the LoTL may constrain student-teachers' ability to explain content and to position themselves confidently as teachers. This paper reports on a qualitative case study that explored how Business Studies student-teachers at the University of Johannesburg experienced language proficiency during school-based teaching practice. The study was informed by Bandura's self-efficacy theory and situated in an interpretivist paradigm. Data were generated through semi-structured one-on-one interviews with three third-year student-teachers specialising in Business Studies. The data were analysed thematically. Two research questions guided the paper: how student-teachers experience language proficiency when implementing the LoTL in multilingual classrooms, and how language proficiency shapes their self-efficacy and confidence during teaching practice. The findings show that English proficiency was viewed as necessary because Business Studies content, notes, and assessment expectations are largely delivered in English. However, English alone did not resolve the problem of learner understanding. Participants reported that learners often lost the meaning of key concepts and business terminology, which required student-teachers to simplify explanations, use learners' home languages for examples, and draw on informal translation support. The findings also reveal that confidence was not only a language issue but also a content and context issue. Participants became more confident when they understood Business Studies terminology, could ask questions in supportive spaces, and could make language choices that matched learner needs. The study concludes that teacher education should strengthen the disciplinary language of academic English and Business Studies while also preparing student-teachers to use principled multilingual strategies in classrooms.

Keywords: *Business Studies, language proficiency, LoTL, multilingual classrooms, self-efficacy.*

INTEGRATING ARTIFICIAL INTELLIGENCE IN STRATEGIC DESIGN EDUCATION: EMPIRICAL EVIDENCE FROM DESIGN COURSES

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Abstract
The rapid adoption of AI tools is transforming educational practices, particularly in Strategic Design, which demand complex problem framing and strategic decision-making. This study examines AI's impact on Strategic Design education through a course experiment where students developed strategic directions for real companies via established process phases. A post-course survey (N=50) assessed AI usage and perceived utility across phases, combining quantitative (Likert-scale) and qualitative measures. Results reveal AI's highest utility in early analytical phases (company description, market/competitor analysis, trend exploration, target identification), where it accelerates information retrieval and synthesis as a cognitive amplifier, without supplanting interpretive roles. Utility declines in generative phases (opportunity definition, scenario construction, selection), where human judgment, critical thinking, and strategic framing remain essential. Findings advocate explicit AI literacy, critical evaluation, and metacognitive training in design curricula, repositioning AI as an augmentative resource contingent on students' problem-framing and output-assessment skills. This approach cultivates designers balancing human reasoning with AI support in complex strategic processes.

Keywords: *Artificial Intelligence, strategic design, critical thinking, human–AI collaboration, design education.*

STRATEGIC MODELS AND HUMAN RESOURCE CHALLENGES IN GLOBAL K–12 AI EDUCATION

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Abstract
AI education has evolved into a global necessity, extending beyond the mere classroom use of AI tools to the integration of AI literacy within K–12 curricula. In this comparative educational policy analysis, we identify four distinct adaptation models currently shaping AI education globally. (1) The Centralized Innovation Model (China) pursues technological leadership and sovereignty. While plans mandate compulsory AI education across all grades by 2025, significant regional disparities in quality persist. (2) The Pragmatic Technocratic Model (e.g., Singapore, South Korea) prioritizes economic efficiency and a "smart society" vision. Here, AI functions as both curricular content and infrastructure (Singapore) or as a dimension of digital literacy (South Korea). (3) The Decentralized Market Model (US, UK) is grounded in institutional autonomy and industry–academia collaboration. Although this facilitates rapid adaptation, the lack of central coordination can exacerbate social inequities in resource-scarce regions. (4) The Humanistic–Civic Model (EU) foregrounds regulation and ethical frameworks, though excessive regulation risks stifling innovation. Across all models, the shortage of appropriately trained teachers constitutes a critical implementation challenge. The uneven distribution of pedagogical support risks creating a new digital divide. While teacher preparedness is a pivotal variable, top-down reforms often provoke resistance, potentially undermining implementation. We conclude that integrating AI into K–12 education is not merely a curricular or technological task, but fundamentally a human resource management challenge.

Keywords: *Artificial Intelligence, elementary secondary education, digital literacy, digital divide, teacher shortage.*

INNOVATIVE EXPERIENTIAL EDUCATION: SOCRATIC GAMES FOR ALL

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Abstract
"Socratic Games for All" is an innovative experiential philosophy and artistic education program developed through the Philosophy and Art Laboratory of the National and Kapodistrian University of Athens (NKUA). The program includes two educational models: "Socrates Games" for primary school students and "The Artistic Socrates" for junior high school and high school students. Designed within the framework of doctoral and postdoctoral research under the supervision of university professors, the workshops combine philosophical inquiry, artistic expression, with emphasis on performing arts, and experiential learning to cultivate critical thinking, emotional awareness, democratic dialogue, and social participation.
The pilot experiential workshop "Socratic Games – Artistic Socrates" was implemented by members of the Philosophy and Art Program at NKUA and was based primarily on active student participation as its central pedagogical approach. The workshops aimed to encourage students to think independently, develop argumentative skills, express themselves creatively, and respect different perspectives and experiences. With Socratic dialogue, students explored philosophical concepts such as justice, freedom, friendship, happiness, responsibility, and identity by connecting them to personal experiences and contemporary social issues.

Keywords: *Socrates, experiential education, Socratic dialogue, critical thinking, dramatic skills.*

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THE ROLE OF GENERATIVE AI IN LOW-CODE ROBOTICS IN STEM EDUCATION

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Abstract
The integration of generative artificial intelligence (GenAI) tools into low-code robotics platforms is sharply changing how educational robotics is integrated in science, technology, engineering, and mathematics (STEM) education. This paper presents a combination of an empirical study and a theoretical positioning to examine the integration of GenAI into low-code robotics within STEM education. The main aim of the study is to examine how GenAI facilitates progress in learn-to-code from basic syntax mastery, such as block-based programming, to advanced system architecture design that integrates multi-agent coordination, sensor fusion, and the ethical deployment of robots in STEM disciplines. Following PRISMA 2020 guidelines, 42 studies conducted between 2022 and 2026 were reviewed from databases including Scopus, Web of Science, IEEE Xplore, and ACM Digital to establish the theoretical positioning. In the empirical study, three low-code-generated STEM robot designs and workflows were analysed deductively to provide a thick description of what is feasible. Findings from both the empirical study and the review suggest that GenAI tools can make programming more approachable for beginners by helping them get started with simple code, providing debugging support, and offering Personalised scaffolding. At the same time, these tools can help learners gradually build the confidence and skills needed to take on more complex tasks, like designing modular systems and improving their work through ongoing refinement. From the analysis of developed robots, although generative AI offers many benefits, several challenges remain when Gen AI tools are used for programming. These challenges include learners still over-relying on AI-generated responses; equity issues related to language and cultural biases that continue to surface in Gen AI responses. This gap clearly shows a need for a well-structured teaching framework that thoughtfully blends human input with Gen AI collaboration. The Implications of this review suggest the need for a conceptual pathway for GenAI-augmented low-code robotics curricula and identify directions for educators and researchers to implement and validate the proposed framework.

Keywords: *Generative AI, low-code robotics, prompt engineering, STEM education, system architecture, syntax mastery.*

TRANSFORMATIVE LEARNING FOR SUSTAINABILITY: A SYNTHESIS OF LEARNING OUTCOMES

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Abstract
Although the transformative learning outcomes have been examined in the literature, there is limited discussion of whether these outcomes differ in a sustainability context, or of the additional dimensions that sustainability learning may introduce. This paper addresses the research question of what the learning outcomes in transformative learning for sustainability are and how they can be evaluated. The analysis is based on an integrative literature review (n=14). The study presents a synthesis of transformative learning outcomes for sustainability comprising an ecologically grounded and systemic worldview, critical sustainability awareness, respect and care for others and the non-human world, motivation for sustainability action, collaborative capacity, and sustainability agency. The evaluation of these learning outcomes warrants further research.

Keywords: *Transformative learning, education for sustainable development, learning outcome, higher education, integrative review.*

LEARNERS' PERCEPTIONS OF DIGITAL TOOL USE IN BUSINESS STUDIES THROUGH DIGCOMP

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Abstract
Digital transformation agendas position digital tools as central to curriculum innovation, yet learners' experiences of these tools in Business Studies remain uneven across socioeconomic contexts. The study reported herein investigated how secondary school learners perceive and experience the use of digital tools in Business Studies, using the European Commission's Digital Competence Framework for Citizens (DigComp) as an analytical lens. A qualitative phenomenological design within an interpretivist paradigm was employed. Focus group discussions and non-participant observations were conducted with eight Grade 10 to 11 learners from two socioeconomically contrasting Johannesburg schools: a quintile 1 township public school and an inner-city independent school. Thematic analysis followed Braun and Clarke's phases and was supported by Atlas.ti. The findings suggest that digital competence is shaped by more than access to devices and connectivity. Four interrelated constructs influenced learners' engagement across the DigComp domains: digital self-efficacy, perceived usefulness of tools for business-related tasks, peer influence, and socioeconomic barriers and opportunities. Learners in the independent school described routine use of collaborative platforms and productivity applications to search for information, co-author tasks, model basic business calculations, and develop multimedia presentations. In contrast, learners in the township school reported intermittent connectivity, restricted time on shared devices, and limited guidance on software use; however, they also demonstrated resourcefulness by relying on peer support and mobile technologies to complete tasks and sustain participation. Across both settings, learners valued digital tools for strengthening conceptual understanding and making Business Studies tasks feel authentic, such as budgeting, market research and business pitches. It is concluded that bridging digital inequities in Business Studies requires both infrastructural support and pedagogical design that explicitly teaches DigComp-aligned practices, including critical information evaluation and digital safety, while building learner agency through structured, collaborative routines that can function in low-connectivity environments.

Keywords: *DigComp, business studies, learner perceptions, digital self-efficacy, digital equity.*

GRADE 11 PHYSICAL SCIENCES TEACHERS' EXPERIENCES OF USING PHET SIMULATIONS-ENHANCED INQUIRY-BASED TEACHING OF CHEMICAL CHANGE

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Abstract
This study investigated Grade 11 Physical Sciences teachers' experiences of using Physics Education Technology (PhET) simulation-enhanced inquiry-based teaching of the chemical change concept. The focus on chemical change was motivated by recurring evidence from South African national diagnostic reports, which consistently indicate that learners struggle to explain chemical processes at a sub-microscopic level. Despite the ongoing global advocation of inquiry-based teaching practices for science classrooms, its implementation still remains a challenge. The study sought to explore how teachers utilise PhET simulations to facilitate inquiry-based teaching of chemical change and to identify the contextual factors influencing their implementation of PhET simulation to support inquiry teaching of chemical change. Following the interpretivist paradigm, a qualitative case study design was adopted to conduct this inquiry on four purposively selected Grade 11 Physical Sciences teachers from four secondary schools in the Johannesburg North Circuit, Gauteng. The purposive selection criteria included their experience in teaching chemical change and use of PhET simulations to support inquiry-based teaching. Data was collected through classroom observations and semi-structured interviews. Classroom observations were guided by the FIT:COM framework which focuses on the integration of technology, pedagogy, and learner interaction. The findings revealed that Physical Sciences teachers used PhET

simulations primarily to support the visualisation of abstract aspects of chemical change, such as particle rearrangement during reactions, and to structure inquiry-based activities, including Predict–Observe –Explain. Findings from both classroom observations and semi-structured interviews further revealed that simulations supported the identification and addressing of learners' misconceptions, particularly the distinction between physical and chemical change. However, teachers' use of simulations often conformed to teacher-centred instructional approaches, which limited opportunities for learner-centred inquiry and independent exploration. Moreover, contextual factors such as limited technological resources, overcrowded classrooms, unreliable internet, and insufficient training led teachers to adopt teacher-centred approaches. Therefore, the study concludes that while PhET simulations have the potential to support the teaching of chemical change, their effectiveness depends on how they are pedagogically integrated to achieve meaningful conceptual understanding of chemical processes. It is recommended that professional development programmes focus on subject-specific strategies for using simulations in inquiry-based teaching and that schools adopt context-responsive innovations, such as shared-device use and offline simulations, to support implementation in resource-constrained environments.

Keywords: *Chemical change, inquiry-based learning, PhET simulations, technology-enhanced science teaching, teachers' lived experiences.*

INITIAL TEACHER EDUCATION AND THE DEVELOPMENT OF INTERCULTURAL COMPETENCE: THE MENTORS' PERSPECTIVE

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Abstract
In a dynamic, multicultural, and inclusive educational environment, the cultivation of intercultural competence within initial teacher education constitutes a central dimension of professional development. Grounded in the ITC model (Dimitrov & Haque, 2016) and Kolb's experiential learning cycle (Kolb, 1984), intercultural teaching competence provides a coherent theoretical framework for strengthening teacher education, particularly within programs oriented toward global engagement and social justice. This study explores mentors' perceptions of existing support, challenges, and developmental opportunities for fostering intercultural competence in initial teacher education. The research tasks were: (1) to examine mentors' experiences working with students from diverse cultural and linguistic backgrounds; (2) to identify challenges in implementing intercultural strategies; (3) to analyze the practices mentors use to support student teachers; and (4) to propose recommendations for improving intercultural approaches in teaching practice and study programs. A qualitative design was employed, using focus group interviews with seven primary school mentors in Serbia. All sessions were audio-recorded in their entirety and subsequently transcribed verbatim. The transcripts excluded references to extra linguistic features. During the coding phase and qualitative data analysis, thematic analysis was employed. A combined abductive coding approach was applied in the process of identifying and developing themes. The findings indicate the presence of two distinct discourses. The first, a humanistic discourse, frames intercultural education primarily as the affirmation and appreciation of diversity, emphasizing the inherent value of cultural plurality. The second, a transformational discourse, rests on the assumption that a culture of coexistence constitutes a dynamic and processual construct, shaped through open dialogue among teachers, students, and parents regarding tensions, inequalities, and challenges.Within these frameworks, mentors identified both effective practices and significant barriers. Effective practices include interactive and participatory methods, group discussions, project-based activities, managing sensitive parental perceptions, and reflective analyses for student teachers during practicum. The main barriers to the implementation of intercultural strategies include the lack of systemic support, limited resources, weak integration of theory and practice, and administrative constraints. The study recommends integrating intercultural content more systematically into teacher education curricula, restructuring practicum and school-based observation, providing continuous professional development for teachers and mentors, strengthening cooperation between schools and faculties of education, and fostering professional communities of practice.

Keywords: *Intercultural education, teacher education, mentors, primary school, diversity*.

INDIGENOUS RESEARCH METHODOLOGIES ADOPTION IN POSTGRADUATE RESEARCH: OPPORTUNITIES AND CHALLENGES

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Abstract
This systematic literature review examines the adoption and utilisation of Indigenous Research Methods (IRMs) in postgraduate research. Although extensive scholarship on Indigenous Knowledge Systems (IKS) has focused on their integration into teaching, pedagogy, curriculum, and policy, far less attention has been given to their use in research methodologies. This imbalance sustains a disconnect between the decolonial aspirations of higher education and the epistemic practices through which knowledge is produced. Despite the cultural relevance and epistemic value of IRMs, their application in postgraduate research remains limited due to structural, ideological, and institutional factors that continue to privilege Western research paradigms. Using the PRISMA approach, the review systematically analysed peer-reviewed journal articles published between 2010 and 2025. Studies were identified, screened, and included based on clearly defined inclusion and exclusion criteria. The review synthesised empirical and conceptual literature to identify dominant patterns, recurring challenges, and gaps relating to the adoption of IRMs in postgraduate education research. The findings indicate persistent barriers to IRM uptake. These include the absence of formal training in IRMs for postgraduate students and supervisors, limited inclusion of IRMs in research methodology curricula and textbooks, inadequate supervisory expertise, and Western-centric examination and peer-review standards that marginalise Indigenous methodologies. Additional constraints include fears of examiner bias and journal rejection, limited funding opportunities for IRM-based research, and the lack of institutional policies that formally support the use of IRMs in postgraduate research. The review recommends embedding IRMs within postgraduate research methodology curricula, strengthening supervisory capacity through targeted training, developing institutional policies and funding mechanisms that support IRM-based research, and broadening research evaluation standards to recognise epistemic diversity. It further calls for empirical studies that evaluate strategies for mainstreaming IRMs in postgraduate programmes.

Keywords: *Indigenous research methods, indigenous knowledge systems, cognitive justice, decolonisation, postgraduate research.*

EDUCATIONAL DECISION-MAKING IN CONTEXTS OF INEQUALITY: A DATA ANALYSIS OF THE GAP BETWEEN POVERTY AND ACADEMIC SUCCESS

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Abstract
The expansion of online learning in emerging economies has intensified interest in the structural determinants of student persistence. This study investigates how district-level socioeconomic configurations relate to academic risk among 3,678 students enrolled in a virtual technology program in Bogotá, Colombia. Using a cross-sectional design that integrates academic records with district-level monetary poverty rates and Gini coefficients across 19 localities, weighted Pearson correlations reveal a counterintuitive paradox: monetary poverty shows a weak, non-significant correlation with academic risk ($r = 0.157$; $p = 0.53$), whereas the local Gini coefficient exhibits a strong negative correlation ($r = -0.647$; $p < 0.01$). Low-income students in high-inequality, socioeconomically mixed localities show success rates approximately three times higher than comparable peers in homogeneously poor peripheral localities. Drawing on theories of urban opportunity structures, social capital, and the digital divide, we interpret the Gini coefficient as a proxy for access to opportunity infrastructure. Findings suggest that territorial interventions targeting digital infrastructure may be more effective for student retention than individual-level income support alone.

Keywords: *Educational data mining, urban inequality, student persistence, digital divide, evidence-based policy.*

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TEACHERS' PEDAGOGICAL PRACTICES WHEN USING INTERACTIVE WHITEBOARDS FOR INTEGRATING INDIGENOUS KNOWLEDGE IN LIFE SCIENCES TEACHING

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Abstract
This study investigated Life Sciences teachers' pedagogical practices when using interactive whiteboards (IWBs) to integrate indigenous knowledge (IK) in Grade 11 teaching and learning. Guided by Cognitive Justice and the Cognitive Theory of Multimedia Learning (CTML), the study adopted a qualitative research design. 10 Life Sciences teachers were purposively selected from schools implementing IWBs in Johannesburg and Ekurhuleni metropolitan municipalities in Gauteng province of South Africa. Data were collected through classroom observations guided by the Reformed Teaching Observation Protocol (RTOP). The study addressed the research question: What pedagogical practices are employed by Life Sciences teachers when integrating IK using IWBs? Data were analysed thematically, allowing themes to emerge from the dataset. Findings revealed that although teachers valued the integration of IK using IWBs, their pedagogical practices were largely limited to displaying static images and videos rather than utilising interactive features to support meaningful engagement with IK. Additionally, teachers experienced challenges including limited IK-aligned digital resources, technical and infrastructural constraints and this showed lack of insufficient professional development. These challenges restricted the effective pedagogical use of IWBs for culturally responsive teaching. As such, this study recommends ongoing professional development focused on pedagogical integration of IK using IWBs, the development of IK-specific digital resources compatible with IWBs, and improved school infrastructure. Notably, the study was limited to a small qualitative sample within one province, which restricts generalisability. Therefore, future research should include multiple provinces and examine the influence of IK integration using IWBs on learner engagement and academic performance.

Keywords: *Life Sciences, qualitative research, cognitive justice, interactive whiteboards, indigenous knowledge.*

DEGROWTH PEDAGOGY IN MANAGEMENT AND BUSINESS EDUCATION

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Abstract
This study addresses the research question of what constitutes the fundamental elements of degrowth pedagogy in management and business education, and how are these elements manifested across the micro, meso and macro levels. The analysis is based on an integrative literature review (n=15). The findings suggest that degrowth pedagogy is inherently oppositional and defines itself through resistance. Specifically, the study identifies the following fundamental elements of degrowth pedagogy: (1) ecocentrism and ecological literacy; (2) an understanding of the historical, value-laden and political nature of social systems; (3) critical thinking and questioning; (4) multi-paradigmatic thinking and imagination; (5) dialogue and reflection; (6) experiential and transdisciplinary learning contexts; and (7) conviviality, care and emancipatory capacities. Resistance to the growth paradigm, alongside the thinking and enactment of degrowth, emerges as a cross-cutting theme. Degrowth pedagogy remains an emerging field of study, and its relationship to related educational perspectives warrants further elaboration.

Keywords: *Degrowth, post-growth, pedagogy, management and business education, integrative review.*

CHALLENGES IN ADAPTED PHYSICAL EDUCATION IN MAINSTREAM AND SPECIAL SCHOOLS IN THE BRICS COUNTRIES

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Abstract
Despite policies supporting inclusive education, the practical application of Adapted Physical Education remains inconsistent in the BRICS nations (Brazil, Russia, India, China, and South Africa). This study explored the challenges in implementing Adapted Physical Education in mainstream and special schools across the BRICS countries with the purpose of making recommendations for good practice. Using Bronfenbrenner's Ecological Systems Theory and the Cultural-historical Activity Theory, a qualitative approach was followed within an interpretive paradigm to examine barriers at various systemic levels, including policy implementation gaps, resource constraints, and teacher training deficiencies. The findings indicate that while BRICS countries have legislative frameworks supporting Adapted Physical Education, practical implementation is hindered by inadequate infrastructure, insufficient teacher training, limited curriculum support, and societal perceptions undervaluing Adapted Physical Education. Russia appears to have more structured Adapted Physical Education programmes, whereas Brazil, India, China, and South Africa report greater inconsistencies in policy enforcement. Participants emphasised the need for increased government funding, professional development, and community awareness to enhance Adapted Physical Education accessibility. The study highlights the necessity of bridging the gap between policy and practice, advocating for comprehensive teacher education, resource allocation, and cultural shifts to support Adapted Physical Education. The findings contribute to the discourse on inclusive education and provide recommendations for strengthening Adapted Physical Education implementation in BRICS nations.

Keywords: *Adapted Physical Education, BRICS countries, barriers, inclusive education, special education.*

INTERCULTURAL AND DIASPORIC EDUCATION IN RURAL SCHOOLS: NARRATIVES AND DRAWINGS ON MIGRATION AND BELONGING

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Abstract
This study examines the integration of diasporic and intercultural education in rural primary schools in Spain, focusing on how students represent migration and cultural diversity through narratives, drawings, and audiovisual production. Using Grounded Theory and a participatory ethnographic approach, it involved 56 sixth-grade students from two schools in Aragón, together with teachers, migrant families, and the school community (Hernández Carrera, 2014; Balcázar, 2003; Gholami, 2025). The study combined artistic production and pedagogical intervention. Students created narratives and drawings on migration and interculturality, analyzed through content analysis and used to develop an animated short film. Semi-structured interviews and classroom observations complemented these materials, exploring integration processes and belonging. Findings show that diasporic education fosters empathy, participation, and intercultural learning while transfor Ming classroom dynamics and curricular practices (Gholami, 2023; Nieto, 2017; Banks, 2013). Students' drawings and the audiovisual project enabled emotional expression, identity construction, and reflection on migration (Fernández–Labayen et al., 2022; Macleroy & Shamsad, 2020). The study also identifies challenges such as linguistic and cultural barriers, peer grouping by cultural affinity, and limited teacher training. Although policy frameworks promote inclusion, implementation remains uneven, highlighting the need for stronger curricular and pedagogical integration of interculturality (Gholami & Costantini, 2025; Vidal Prado, 2023).

Keywords: *Intercultural education, diasporic education, migration, drawings, belonging.*

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LEARNING MATHEMATICS THROUGH INTEGRATION OF MUSIC ACTIVITIES

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Abstract
This study examines the impact of music on mathematics learning for first grade students, focusing on the role that rhythm, melody, and musical activities play in the acquisition of basic mathematical concepts. In primary education, especially in first grade, students face challenges in understanding numbers, simple operations, and spatial-temporal relationships. Integrating music into the learning process represents an innovative approach that promotes motivation, concentration, and active involvement of students. The study is based on contemporary pedagogical literature and concrete practices implemented in the classroom, where songs, rhythmic games, and exercises with musical elements are used to reinforce concepts such as counting, comparing numbers, addition, and subtraction. The results show that the use of music has a positive impact on improving memory, developing logical skills, and creating a more engaging and collaborative learning environment. Participants of the study are first grade teacher and professor of music education (authors of the study) 60first grade students of elementary public school of Gjakova, Kosovo. The methodology of the study is the participatory action research. The intervention program is based music activities. For the study were used qualitative and quantitative data collection techniques: interviews with teachers, and tests and observation. The results from this study will explain that the use of music activities can improve student's skills learning mathematics. In conclusion, the paper emphasizes that music is not just an entertainment tool, but an effective pedagogical strategy that can increase the quality of learning in mathematics in the primary cycle, contributing to the comprehensive development of children.

Keywords: *Musical activities, interdisciplinary, mathematic learning, motivation.*

PRE-SERVICE TEACHERS' PERCEPTIONS AND EXPERIENCES OF USING SMARTBOARDS TO PROMOTE ACTIVE LEARNING DURING TEACHING PRACTICE

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Abstract
This study explored pre-service teachers' perceptions and experiences of using smartboards to promote active learning in South African classrooms during teaching practice. Grounded in Mayer's Cognitive Theory of Multimedia Learning (CTML), the research employed a qualitative design, and semi-structured interviews were administered to five final/fourth-year PSTs at a South African university, who had completed 20 weeks teaching practice over the four years of B.Ed. programme. Findings were analysed using thematic analysis. Findings revealed that participants held positive perceptions of smartboards' potential to foster engagement, collaboration, and differentiated instruction. However, most participants reported feeling inadequately prepared to use smartboards effectively in their teaching practice. Limited training, insufficient hands-on experience during their teacher education programme, and inadequate mentorship during teaching practice were identified as key factors contributing to this lack of preparedness. In addition, participants highlighted several contextual challenges that constrained effective implementation, including technical difficulties, limited access to functioning equipment, lack of technical support, and time constraints within lessons. The study recommends enhancing teacher training curricula to include pedagogically focused, hands-on smartboard teaching and stronger school-university collaboration. This will better equip future teachers to implement smartboard-supported teaching and learning strategies confidently and effectively.

Keywords: *Smartboards, pre-service teachers, active learning, teaching practice, multimedia learning.*

THE APPLICATION OF ASSISTIVE TECHNOLOGY IN A SPECIAL PROGRAM FOR ACQUIRING COMPETENCIES IN ACTIVITIES OF DAILY LIVING

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Abstract
Assistive Technology (AT) is increasingly recognised as a key factor in supporting students with developmental disabilities, particularly in the context of acquiring competencies in activities of daily living. Despite a growing body of literature on the effects of AT, practical accounts of its application in special education programs remain scarce, hindering its implementation in everyday professional practice. The aim of this paper is to describe the diversity of assistive technology needs among students with multiple disabilities enrolled in a special program and to present practical ways to implement AT during group work, with an emphasis on the importance of individualised adaptation. The study was conducted at the Centre for Education and Rehabilitation Goljak in Zagreb. The participants were four students from an educational group aged 7 to 11 years with multiple disabilities. A needs assessment was carried out using the WATI (Wisconsin Assistive Technology Initiative) instrument, which is based on the SETT framework and covers communication, motor skills, sensory abilities, organisation, and leisure. Following the assessment, activities for acquiring daily living competencies were designed and implemented using available AT, including Big Points and Talking Brix2 communication devices, GoTalk4+, iTalk4, talking photo albums, switch-operated toys, and a tablet with ICT-AAC applications. Data were analyzed using a qualitative method. The results indicate significant heterogeneity in AT needs within the same educational group, confirming the need for an individualised approach. In all students, increased motivation for participation, longer sustained attention on tasks, and more frequent initiation of expressive communication were observed when using AT. The presented activities demonstrate that the same educational content can be acquired in different ways through various forms of AT, tailored to each student's motor, cognitive, and sensory abilities. The paper emphasises that implementing AT is not a one-time activity but a continuous, collaborative process that requires the professional competencies of educational rehabilitators, systematic assessment, and environmental support. In conclusion, the high-quality, individualised application of AT in special programs can significantly contribute to the development of functional competencies and to increased autonomy and quality of life for students with developmental disabilities.

Keywords: *Assistive Technology, special education program, activities of daily living, individualized approach.*

GRADE 10 SOUTH AFRICAN LEARNERS' EXPERIENCES DURING FACE-TO-FACE AND ONLINE LEARNING – IMPLICATIONS FOR SOCIAL INTERACTION

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Abstract
Learning in South Africa is characterised by unequal access and a diversity of cultures and languages within a single classroom, which influences social interaction. As technology becomes more sophisticated and readily available in classrooms, the question arises of whether digital tools influence social interaction to support learning. With Social Learning Theory being the primary lens, this study explored how South African grade 10 learners experience social interaction in face-to-face and online classrooms. In the context of multilingual, ongoing inequalities in resources and infrastructure, the study examined how modelling, feedback, and reinforcement differ across the two modalities. Learners from six schools were asked to complete a survey measuring teacher-learner interaction, peer interaction, classroom environment, technology-mediated interaction, and perceived social interaction in learning. Learners generally reported positive views across the variables above (M = 3.28–3.74). Face-to-face learners reported stronger peer interactions and teacher-learner relationships, as well as a more positive classroom environment, than those in online learning. Correlations showed a strong association between the classroom environment and both peer interaction (r = .61) and teacher-learner interaction (r = .51), whereas technology-mediated interaction

was split into two factors. The logistic regression classified 84.4% of learners and identified peer interaction (B = -2.07, p = .002), age of the learner (B = -1.66, p = .27), home language (B = -0.96, p = .004) and repeated grades (B = -3.06, p = .006) as significant predictors of modality. This study makes a unique contribution by providing context-specific empirical evidence on how modelling, observation and reinforcement are supported in South African secondary schools. The study also highlights the vulnerability of peer interaction in online schools, the importance of the affective classroom environment for meaningful interaction, and the need for intentional design to recreate social interaction contexts in online classrooms. This study offers insights for curriculum planners, teachers and school leaders who plan to integrate technology meaningfully while maintaining the relational foundations of effective learning.

Keywords: *Social interaction, classroom atmosphere, teaching and learning relationships, secondary schools, technological tools.*

SPACED LEARNING IN SECONDARY SCHOOL: A CROSS-BORDER TEACHING PROPOSAL

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Abstract
Spaced learning is a teaching methodology that structures time to optimize students' attention, concentration, and long-term memory consolidation. Kelley and Whatson (2013) developed this approach to investigate whether delivering brief inputs at structured intervals could facilitate the encoding of complex information into long-term memory. This methodology frames the educational setting as a dynamic environment capable of fostering students' active engagement and metacognitive awareness. Building on these premises, this study aims to design and test a spaced learning pathway within upper secondary education, specifically targeting core subjects in vocational institutes for food and wine services and hospitality. The objective is twofold: to enhance learning outcomes in vocational subjects and to promote inclusion and school well-being, which are central to educational quality and academic success. The five-phase educational intervention comprises three cognitive input sessions interspersed with two breaks featuring distracting activities. Within this framework, motor activity plays a strategic role, supporting knowledge consolidation by integrating bodily experience with cognitive processes. This approach is particularly relevant from an inclusive perspective, as it may prove especially effective for students with special educational needs, fostering a more accessible, participatory, and motivating learning environment. Operationally, the pathway alternates lesson time with ten-minute sessions of motor activities and interactive games, aiming to support a more effective, relaxed, and meaningful learning process. Applying spaced learning to vocational subjects in food and wine studies and hospitality is thus intended not only to strengthen technical skills but also to positively influence participation, inclusion, and perceived well-being. The experimental research will be conducted over two years, involving a sample of 500 students equally distributed between Italy and Tunisia. Through this comparative and transnational perspective, the study seeks to analyze the methodology's effectiveness across different educational contexts, contributing to the scientific debate on innovative teaching strategies oriented toward academic success, inclusion, and the promotion of well-being at school.

Keywords: *Inclusion, physical activity, school well-being, spaced learning, upper secondary school.*

TEACHING AND LEARNING

THE SYLLABLE KNOWLEDGE VACUUM: ESTABLISHING BASELINE SYLLABLE AWARENESS AMONG JAPANESE UNIVERSITY EFL LEARNERS

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Abstract
Despite years of English instruction, Japanese university English as a foreign language (EFL) learners demonstrate persistent difficulties with English syllable structures. This difficulty is often attributed to mora-based first language (L1) interference. However, research documenting these learners' baseline syllable knowledge is lacking. A study was conducted that examined pre-instructional syllable awareness among 511 Japanese university students across four proficiency levels using open-ended definitions and a syllable counting task. Results revealed a striking though unsurprising knowledge vacuum: more than two-thirds of the participants could not define "syllable" at all, and most definitions showed vague or incorrect understanding. The syllable counting task yielded similarly high non-response rates for both English (22.3%) and Japanese words (22.9%), with no statistically significant difference between word origins. Uniform difficulty across proficiency levels suggests an absence of fundamental syllable concept knowledge rather than mora interference, thereby indicating that effective instruction and interventions would likely benefit from including initial explicit concept introductions and explanations.

Keywords: *Baseline assessment, Japanese EFL learners, mora interference, phonological knowledge, syllable awareness.*

BEYOND SUSTAINABILITY: DESIGNING A REFLECTIVE SELF-ASSESSMENT FRAMEWORK FOR HIGHER EDUCATION

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Abstract
Educational responses to ecological challenges have traditionally been guided by sustainability, green values, and circular economy discourses. While these frameworks have played a crucial role in mitigating environmental harm, they remain insufficient for achieving deep systemic transformation. The next step - a paradigm shift beyond these established approaches - is regenerative thinking. Importantly, regenerative thinking does not replace sustainability or circularity; rather, it builds upon these foundations to move past harm reduction toward actively restoring, renewing, and enabling the flourishing of ecological and social systems. In higher education, advancing this shift is particularly critical, as universities shape the knowledge, values, and agency of future professionals who will lead regenerative practices. This study addresses the question: How can students reflect their regenerative thinking? It focuses on the development of a reflection tool that supports students in reflecting on their learning processes and the adoption of regenerative perspectives. Narrative methodologies are employed to capture participants lived experiences and connect them with relevant theoretical frameworks. Data were collected during a Regenerative Research Camp involving 9 participants (2 international and 7 from Finland) and analyzed using inductive content analysis. Building on existing models of sustainability learning and reflective assessment, the study proposes a conceptual framework to inform the design of the reflection tool. The aim is to advance pedagogical practices in higher education by supporting learners in developing regenerative mindsets that enable them not only to sustain but also to actively regenerate ecological, economic and social systems.

Keywords: *Regenerative thinking, self-assessment, higher education.*

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MENTAL HEALTH DURING DOCTORAL STUDIES

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Abstract
The general health of students in Germany has deteriorated significantly between 2015 and 2023. In addition to extensive changes in the higher education system, such as increasing internationalisation and digitalisation, as well as study-related factors such as exam and performance pressure, social and political crises such as the consequences of the COVID-19 pandemic and the Middle East conflict also have an impact on the psychosocial stress experienced by students. Furthermore, intersectional inequalities based on socio-structural characteristics (e.g. chronic illness, sexual orientation) within higher education institutions can influence the development and maintenance of mental health and thus have individual effects on (mental) health equity. Doctoral students are also affected by these developments. The diverse challenges they encounter during their doctoral studies can lead to individual and structural overload due to various factors and impair their mental health. As a result, doctoral students have an increased risk of mental illness, such as anxiety disorders and depression, compared to the general population. As educational institutions, universities are becoming increasingly aware of their responsibility to create a health-promoting environment in order to recognise the effects of crises and disadvantages within their organisational structures and to take these into account by shaping their university culture accordingly. As a result, universities increasingly see themselves as actors in health promotion and anchor the associated values in their self-image, e.g. in the form of a Student Health Management (SHM) system. Based on this approach, this article presents the research project 'Mindful Campus' (MinCa). MinCa aims to strengthen the mental health literacy (MHL) of students and doctoral candidates and to establish an SHM system at the university in order to create a health-promoting environment and integrate it sustainably into the university structures. The continuous inclusion of the perspectives of students and doctoral candidates is essential in this context. The planned presentation and the resulting article will therefore explore how supporting the individual development of MHL, especially among doctoral candidates, can contribute to developing a participatory approach that structurally enables the integration of MHL in order to establish sustainable SHM at the university. To illustrate this, the planned article will present anchor examples from primary data: a qualitative study with ten semi-structured, problem-oriented interviews with doctoral students, which were analysed using theoretical coding according to Flick (2017).

Keywords: *Health promotion, mental health, mental health literacy, health management for doctoral candidates, participation.*

ENHANCING STEM EDUCATION: EVALUATING EFFECTIVE TEACHING STRATEGIES IN PRE-SERVICE TEACHER EDUCATION

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Abstract
Scientists and Science Educators have promoted Science, Technology, Engineering, and Mathematics (STEM) education for at least two decades. Although STEM education is well-defined, there is no consensus on how to effectively integrate Science, Technology, Engineering, and Mathematics in primary and middle schools, where subjects are taught in silos. This two-year collaborative action research study was conducted by a Mathematics educator and a Science educator to investigate the effectiveness of STEM teaching strategies used in a teacher education program in Canada. The teaching strategies included Science and Math integration using lectures, workshops, and projects that utilized the Engineering Design Process and Coding. The instructors co-designed and implemented STEM teaching strategies and collected data from student teachers. Forty middle school pre-service teachers participated in the study. Data collection involved pre- and post-surveys, focus groups and student projects. The study's findings show that the STEM teaching strategies employed in the course significantly improved pre-service teachers' confidence and preparedness to use an integrated approach to STEM teaching. The study's findings add to the literature on transformative STEM teaching among pre-service teachers.

Keywords: *STEM teaching strategies, science and mathematics integration, teacher education, pre-service teachers, science education.*

REINVENTING STEM PATHWAYS IN MEXICAN UNIVERSITIES

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Abstract
Mexican higher education is facing a turning point in STEM fields (Science, Technology, Engineering, and Mathematics). In several public universities, both demand and graduation efficiency show clear signs of weakening, even as the global productive environment increasingly requires highly qualified technological profiles. This article analyzes how university training can be aligned with Mexico's emerging technological needs, drawing on the case of the Universidad Autónoma Metropolitana (UAM), Azcapotzalco campus, and its Division of Basic Sciences and Engineering (DCBI). A quantitative-documentary and institutional approach is adopted, combining internal statistics (2017–2024) on applicants, admitted students, and graduates with administrative records related to academic interruptions, the rigidity of the trimester-based model, academic tutoring, and faculty aging. The data show that at UAM Azcapotzalco, the number of applicants decreased from 28,682 in 2017 to 21,525 in 2023, while within the DCBI the number of graduates fell from 679 in 2018 to 442 in 2022. It is argued that this trend cannot be explained solely by external shocks (e.g., the pandemic), but rather by internal dynamics that affect academic trajectories, time to degree completion, perceptions of institutional stability, and linkages with the productive sector. In a context of nearshoring, digitalization, and advanced manufacturing (World Economic Forum, 2023), the article proposes four lines of transformation: flexible, competency-based pathways with certifiable intermediate exits; hybrid and work-integrated programs; strategic use of artificial intelligence for tutoring, early detection of academic lag, and curricular updating; and more transparent, employability-oriented university–industry partnerships.

Keywords: *STEM education, public universitie, engineering, academic innovation, UAM.*

BRIDGING THEORY AND PRACTICE FOR EQUIPPING STUDENT TEACHERS FOR MULTIGRADE CLASSROOM

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Abstract
Multigrade teaching is prevalent in South African rural classrooms due to low learner enrolment that influences staff establishment. Although there is a theoretical standing incorporated into the teacher education curriculum, however, pre-service teachers find it difficult to apply it in multigrade class realities. Given that multigrade teaching demands distinctive pedagogical knowledge and adaptive teaching strategies. The aim of this study is to investigate how the theoretical and practical elements of multigrade module content contribute to student teachers' readiness for multigrade teaching. A qualitative research design was employed, within an interpretivist paradigm which acknowledges that reality is socially constructed, and knowledge is best understood through the subjective experience of the individual. Purposive sampling was used to select 25 student teachers enrolled for a multigrade module in Learner Support. Data were generated through the semi-structured individual interviews method, which allowed participants to respond to questions related to their learning experiences in relation to their application in multigrade classrooms. Thematic analysis was used to interpret the data, revealing key themes such as pedagogical understanding, resource management, and contextual adaptability. The findings demonstrate that multigrade teaching significantly contributes to bridging the gap between theory and practice by fostering reflective thinking, collaboration, and an appreciation of classroom diversity. Nevertheless, participants expressed the need for increased practical exposure and contextualized learning opportunities. The study concludes that aligning the multigrade module content more closely with real- classroom experiences can enhance student teachers' professional preparedness and pedagogical competence.

Keywords: *Learner support, multigrade teaching, multigrade classroom, student teachers.*

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DEVELOPING INCLUSIVE PRAXIS AMONG TEACHER TRAINEES ON INCLUSIVE PRACTICES THROUGH ENGAGEMENT PROFESSIONAL LEARNING COMMUNITIES

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Abstract
The provision of learner support services to learners that are experiencing barriers to learning is continuing to be a matter of concern. Among the challenges that impede support provision is inadequacies in learner support teacher training which leads to inconsistencies between theory, pedagogies and classroom practices. The aim of this study is to bridge the gap between learner support theory and its application through professional learning communities formed by learner support teacher trainees and learner support lecturers. Methodologically, this study employed PALAR design within a transformative paradigm and photovoice was used as a data generation method to first establish how does module content currently capacitates teacher trainees with the ability to apply learner support in real-life situations. A voluntary purposive sampling strategy was used to recruit 25 learner support student trainees. Findings revealed 1) identifiable gaps between what the content says and how to apply it; 2) A need for in-service opportunities while still in training and 3) practical collaborative initiatives where different stakeholders work together for the benefit of learners experiencing barriers to learning. This study highlighted the invaluable students' voice on the content embedded in their training materials.

Keywords: *Inclusive praxis, inclusive practices, PALAR, professional learning.*

REFLECTIVE WRITING IN NURSING STUDENTS' CLINICAL INTERNSHIP AND LEARNING: A LITERATURE REVIEW

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Abstract
Reflective writing is increasingly used in nursing education as a strategy to support learning during clinical internships, however its educational impact and optimal implementation are still being debated. This narrative literature review explores how reflective writing influences nursing students' learning processes and identifies conditions that enhance or limit its effectiveness. A structured search was conducted in MEDLINE, CINAHL and Google Scholar (August 2025 and January 2026), without time restrictions, including English- and Italian-language qualitative, quantitative and mixed-methods studies focused on reflective writing in clinical education. Study selection followed title/abstract and full-text screening, supported by reference and citation tracking; methodological quality was appraised descriptively to support interpretation of findings. The synthesis highlights consistent evidence for the role of reflective writing in promoting metacognitive development, critical thinking and emotional awareness, while findings regarding direct improvements in clinical performance are more heterogeneous. Reflective writing appears most effective when guided by structured prompts, integrated into curricula, and supported by trained educators providing constructive feedback. Conversely, unstructured approaches and high perceived workload may reduce student engagement and learning value. Overall, reflective writing represents a meaningful educational strategy when embedded within supportive pedagogical frameworks. Educators are encouraged to adopt guided reflective models and create psychologically safe learning environments to facilitate deeper reflection and professional growth during clinical training.

Keywords: *Reflective writing, nursing students, nursing education, learning, clinical internship.*

DISABILITY AND EARLY CHILDHOOD EDUCATIONAL SERVICES: A STUDY ON FUTURE EDUCATORS' PERCEPTIONS OF INCLUSIVE DESIGN

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Abstract
National, European, and international regulations increasingly articulate the principle of inclusion within early childhood educational services by emphasizing the importance of ensuring effective accessibility, enhancing children's learning processes, and improving the quality of relationships developed within these contexts. The overarching goal is to enable all children to actively participate in culturally meaningful and high-quality experiences from the earliest years of life. Within this framework, adopting an inclusive approach to the design and implementation of educational processes is essential in order to promote autonomy, self-determination, and the development of competencies for every child. From an inclusive perspective, educational design in early childhood services plays a crucial role, as it allows practitioners to anticipate the intended effects of pedagogical actions while taking into account children's characteristics and the ways in which environmental and relational arrangements may generate such effects. Educational design must therefore be multidimensional, considering children in their entirety, within their system of relationships and living contexts. The person, understood as a network of relationships, is embedded within an ecosystem of affective, social, and cultural bonds, which calls for an ecological perspective on development and a global, integrated, and multimedia view of pedagogical action. Starting from these premises, the study aims to analyze future educators' perceptions, representations, and expectations related to the design of inclusive pedagogical interventions, with particular reference to children with disabilities. The sample consists of students enrolled in the Bachelor's Degree in Education (Early Childhood Education curriculum) at the University of Salerno. A quali-quantitative questionnaire was administered within the course *Inclusive Design within Early Childhood Educational Services*, in order to explore levels of awareness, self-perceived competencies, and emerging training needs related to inclusion. The findings reveal a heterogeneous landscape of educational practices observed during internships. The most frequently reported approach concerns individualized or adapted activities indicating a general sensitivity toward differentiation. A significant proportion of responses highlights the absence of structured inclusive design, while only a limited number of cases described good inclusive practices characterized by intentional design, accessible materials and coherent organizational strategies. These results suggest that, despite the formal endorsement of inclusive principles, inclusive educational design in early childhood educational services remains unevenly implemented and largely dependent on individual initiative. The study underscores the need to strengthen both initial and in-service educators' training, promoting inclusive design as a reflective, shared, and documented pedagogical process capable of supporting the full participation of all children, particularly those with disabilities.

Keywords: *Early childhood educational services, educational design, disability, inclusion.*

STUDENT VOICES: AN EXPLORATION OF AFRICAN-STUDENT AGENCY TO INFORM TEACHING AND LEARNING PRACTICES

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Abstract
At national universities in South Africa, various events during the past years indicate that students are encumbered by their disposition of being poor and historically disadvantaged. It is widely acknowledged that students from rural geographical areas experience the university space as alienating and not resonating with their life worlds. In this qualitative paper, I respond to Fataar's (2019) idea of the ´misrecognised´ university student in the South African context. My focus on students coming from historically disadvantaged communities aims to contribute to ongoing debates about decoloniality in the university sector. The problem to be addressed in this paper is the misalignment between the critical horizontal knowledge of historically disadvantaged students and the knowledge codes of the university relating to learning, curriculum, and pedagogical practices. Therefore, I argue that if universities reframe their institutional practices they could possibly engage students in their intellectual growth. In this paper, I am guided by the aim to explore how students from historically disadvantaged communities use their critical

horizontal knowledge to connect with the disciplinary and transdisciplinary knowledge of the university to enhance critical specialized consciousness in becoming of ethical humans. In response to the aim, I locate my arguments in African student agency theory, which argues for a dialectical acknowledgement of historically disadvantaged students living in the shadows of the university. The study used nine participants chosen through purposeful sampling and snowballing from two campuses of one university. All the selected participants came from historically disadvantaged areas from different provinces in South Africa. I used the analysis of two survey instruments: an autobiographical reflection/writing and a semi-structured interview. The data collected were analysed through the model suggested by Henning (2004). Students used their critical horizontal knowledge as a stepping stone to access the cultural capital embodied in the formal structures of the university. Reframing the core institutional function of the university to align better with diverse student bodies can lead to academic success of university students.

Keywords: *African student agency, critical horizontal knowledges, historically disadvantaged, South Africa, teaching and learning practices.*

COMPARING FLIPPED AND TRADITIONAL CLASSROOMS FOR GENDER EQUITY IN CHEMISTRY ACHIEVEMENT: A SOUTH AFRICAN CONTEXT

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Abstract
Despite reforms, gender gaps in science, especially chemistry, persist in under-resourced South African schools, with geography, socio-economic status, and teaching practices further disadvantaging female students. Despite the promise of flipped classroom (FC) pedagogy to improve achievement, concerns remain that these innovative methods might widen gaps, as research on FC in these schools, disaggregated by gender, is scarce. The study compared FC with traditional face-to-face (F2F) instruction to assess whether FC improves equity and narrows achievement gaps among Grade 12 organic chemistry students. Participants were randomly divided into two equal groups: Group 1 (52 females, 48 males; FC) and Group 2 (48 girls, 52 boys; F2F). Each group was taught all organic chemistry concepts by one male and one female teacher over seven weeks in Term 1, 2021, before writing a validated organic chemistry test to assess their achievement. No pretest was given since students were learning organic chemistry for the first time. Data were analysed using descriptive statistics and a two-way ANOVA (independent variables: gender [male, female]; instruction [FC, traditional F2F]; dependent variable: test score). All skewness values for test scores fell within the normal range (-1 to +1). Levene's test showed homogeneity of all variances ($p > .05$). Tests of between-subjects effects showed gender had an insignificant impact on test scores, $F(1, 196) = 1.07$, $p > .05$, $\eta^2 = 0.005$, with males' mean ($M = 34.90$, $SD = 19.32$) slightly higher than females' ($M = 33.08$, $SD = 17.34$). A significant main effect of the instruction method was observed, with Group 1 outperforming Group 2. However, the interaction between instruction and gender was not statistically significant, $F(1, 196) = .001$, $p > .05$, $\eta^2 = 0.000$. Group 1 females had higher estimated marginal means ($EMM = 40.54$, $SE = 2.31$) than Group 2 ($EMM = 25.00$, $SE = 2.409$), and the difference was statistically significant ($p < .05$). Similarly, for males, Group 1 ($EMM = 43.04$, $SE = 2.409$) was significantly higher than Group 2 ($EMM = 27.39$, $SE = 2.314$) ($p < .001$). The EMMs for males' and females' test scores in Groups 1 and 2 were similar, with p-values > .05, indicating FC does not worsen gender disparities and can improve or maintain equity in chemistry achievement. Findings support extending the FC approach across various contexts to prevent the widening of the gender gap in chemistry while enhancing achievement in under-resourced South African schools.

Keywords: *Flipped classroom, gender equity, chemistry achievement.*

HUMANISTIC EDUCATION TODAY: LITERARY INTERPRETATION AS A PATH TO AUTHENTICITY AND INDEPENDENT THINKING

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Abstract
In today's global information society, employers seek graduates who can manage complex tasks, approach problems from multiple perspectives, make informed decisions, and demonstrate skills appropriate to their professional field. At a time when discussions about the importance of humanistic education are taking place across various forums, an important question emerges: can literature contribute to the development of such competencies? To what extent can the study of literature support originality and independent thinking when technological tools – especially artificial intelligence – significantly influence and reshape our cognitive habits? This paper aims to demonstrate the potential of literary education to cultivate deeper forms of critical thinking while fostering authenticity, creative reasoning, and personal cognitive development. In this context, literature – both national and foreign – provides an epistemological and pedagogical environment in which these abilities can be meaningfully nurtured. Through complex narrative structures, diverse voices, and situations that prompt ethical and moral reflection, literary texts encourage students to reflect on perspective, context, and identity in an integrated way. They offer a cognitive-emotional space in which readers encounter otherness, explore ambiguity, and acquire distinctive interpretative strategies that cannot be automated or delegated to technology. This potential is particularly evident in migrant and transnational literature, which provides the foundation for the theoretical and didactic concept presented in this paper, aiming to contribute to current professional and societal reflections on the role and relevance of humanistic education. We give particular attention to how literary interpretation can stimulate the development of critical thinking, enhance sensitivity to subtle and implicit layers of meaning, and strengthen the individual capacities through which people construct their understanding of the world and their place within it.

Keywords: *Critical thinking, literary interpretation, authenticity, humanistic education.*

AGILE METHODOLOGIES TO FOSTER TRANSVERSAL COMPETENCIES IN AGRICULTURAL MECHANIZATION EDUCATION: A PILOT EXPERIENCE

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Abstract
This pilot study examines the integration of the SCRUM framework into the practical component of the *Sustainable Agricultural Mechanization* course at the Universidad Politécnica de Madrid (UPM), with the aim of enhancing both technical learning and transversal competencies. Students were organized into four teams to design and deliver field-based sessions on key mechanization topics, using SCRUM roles, sprints, and AGILE tools. Quantitative results show consistently high scores in organizational and management competencies (7.65–10.00), demonstrating that students effectively defined objectives, managed tasks, and coordinated activities within the AGILE structure. Technical learning outcomes were positive in three of the four practices (mean scores >7), although the Seeding session revealed reduced technical performance (4.81) due to limited preparation time caused by scheduling constraints. Qualitative feedback further highlighted challenges in peer management, communication, and leadership when coordinating large groups in field settings. These findings suggest that SCRUM can be successfully adapted to field-based engineering education, promoting student autonomy, engagement, and the development of transversal competencies. However, as the results derive from a single implementation, they should be interpreted as preliminary. Future iterations across consecutive academic years—integrating the improvement actions identified in this pilot—will be necessary to confirm the robustness of the approach, refine its application, and determine its long-term impact on both technical learning and professional skill development in agricultural engineering.

Keywords: *Educational innovation, active learning, student-led, teamwork, transversal skills.*

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NAVIGATING LEARNING IN THE MIDST OF POLYCRISIS: EXPLORING THE IMPLEMENTATION OF RESILIENCE-BUILDING STRATEGIES TO REDUCE SCIENCE ANXIETY, IMPROVE SELF-EFFICACY AND ENHANCE LONG-TERM STEM PERFORMANCE FOR SUSTAINABILITY

Sakyiwaa Boateng
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Abstract
This study explores the implementation of resilience-building strategies to reduce science and mathematics anxiety, strengthen self-efficacy, and enhance long-term STEM performance among preservice teachers in a historically disadvantaged institution of higher learning. Situated within the broader context of global and local polycrisis, characterised by socio-economic inequality, educational disparities, and systemic marginalisation, the project responds to persistently high levels of science and mathematics anxiety among students from rural and low socio-economic backgrounds. Grounded in resilience theory and social justice-oriented pedagogy, a qualitative case study design was employed. A structured professional development programme was implemented to support STEM lecturers in integrating resilience-informed and inclusive teaching practices into their classrooms. Data were generated through semi-structured interviews with lecturers and students, reflective journals, focus group discussions, and classroom observations. Thematic analysis was used to explore participants' lived experiences of anxiety, coping, and pedagogical transformation. Findings reveal that creating humanising, dialogic classroom spaces enabled students to openly articulate their anxieties and to reconstruct their identities as capable science and mathematics students. Participants described shifts from fear and avoidance toward increased confidence, persistence, and active engagement. Lecturers reported greater awareness of students' socio-emotional realities and intentionally adapted their teaching to connect scientific knowledge to students' lived experiences. The study recommends embedding resilience-informed pedagogy within lecturer professional development programmes, institutionalising socio-emotional support structures in STEM curricula, and advancing equity-driven policies that recognise the structural roots of science and mathematics anxiety.

Keywords: *Science anxiety, mathematics anxiety, resilience, polycrisis, STEM education, sustainability, social justice.*

INTENSIVE PARTICIPATORY ACTION LOOP WITH YOUTH

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Abstract
To support young women's participation and development of agency in a community makerspace, the AAMASE project researchers and participants developed and employed participatory design principles, activities and tools. While these principles, activities, and tools are shared briefly, this paper focuses on the Intensive Participatory Action Loop (IPAL) innovation developed and implemented to ensure that youths' experiences of the pedagogical practices and curricular materials were centered in the final manifestation/iteration of the curricular guide. This paper presents the method as well as data and analysis of young women's participation in the innovation. The IPAL activities presented here took place over a three-day intensive data collection with three youth participants and three researchers (including an undergraduate student). Multiple innovative methods were used to gather and explore youth insights into the near final draft of the activities and curricular guide. Youth engaged in artifact creation (timelines of their participation), interviews, whole group discussions, reactions to quotes from adult mentor interviews, and a making activity. This data was used to create a final iteration of the curricular materials and to inform future trainings to ensure the centrality of the youth voice.

Keywords: *Participatory design, youth, maker education, agency.*

INNOVATING BIOLOGY EDUCATION IN PHYSIOTHERAPY: A MULTICULTURAL, INCLUSIVE, PROJECT-BASED WORKSHOP

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Abstract
Within the framework of the Teaching Innovation Strategies promoted at Universidad San Pablo-CEU, an educational innovation project was developed at the School of Medicine for first-year students enrolled in the Physiotherapy degree. This program welcomes a highly heterogeneous and multicultural student population and is taught in both Spanish and English. A recurrent challenge identified among Physiotherapy students is the perceived lack of relevance of basic science subjects (particularly Biology) to real-world clinical practice, which can negatively affect motivation and learning outcomes. To address this issue, an innovative workshop was designed for the Biology course (first semester), which integrates Cell Biology and Biochemistry through a cross-disciplinary and applied approach. The main objective of the project was to promote active, dynamic learning strategies that enhance student engagement while fostering the development of transferable skills essential for clinical decision-making in future physiotherapy practice. An inclusive, multicultural activity centered on gastronomy was implemented using Project-Based Learning and clinical case methodology. Students were provided with a dossier describing fictional characters whose names and profiles reflected specific physical activity levels or pathological conditions. These characters were intentionally designed to allow students to establish connections between cellular, biochemical, tissue, and organ-level alterations. Each student was assigned a character and asked to select a traditional dish from their country of origin that would be nutritionally appropriate for the character's metabolic condition, with the aim of improving their physiological state. Students analyzed the biochemical and cellular implications of the selected dish, identified the affected tissues and organs, and justified their choices based on scientific reasoning. The activity concluded with the submission of individual dossiers and an oral presentation, followed by a guided group discussion that encouraged peer feedback, critical thinking, and the exploration of alternative approaches. Student feedback, collected through online questionnaires, was highly positive. Outcomes included increased motivation and engagement with the Biology course, improved academic performance, and enhanced creativity, empathy, tolerance, and cultural awareness. Overall, this innovative workshop successfully demonstrated the clinical relevance of basic sciences for Physiotherapy students while promoting digital competence, internationalization, appreciation of cultural heritage, healthcare and sustainability. Additionally, the activity fostered an inclusive and collaborative classroom environment, contributing positively to students' academic and professional development throughout their university studies.

Keywords: *Project-based learning, internationalization, transversality, physiotherapy, biology.*

REASONING THROUGH REPRESENTATION: THE ROLE OF DRAWING IN MODEL CONSTRUCTION IN PRIMARY PHYSICS

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Abstract
This study investigates the epistemic role of drawing in primary science classrooms, conceptualizing it as a semantic tool that mediates the transition from concrete experience to abstract conceptualization. Building on socio-constructivist and multimodal perspectives, drawing is framed not as a mere representational outcome but as a generative semiotic practice through which children externalize, negotiate, and reorganize their emerging scientific models. Our classroom-based research in primary physics education shows that drawing operates as a proto-modeling device: it enables students to move from what has been described as "physical babbling" toward progressively structured explanatory systems. In this process, the pictorial register functions analogously to its documented use in early algebra, where visual representations support the shift from arithmetic reasoning to relational and structural thinking. In both domains, drawing sustains reasoning through representation—where conceptual insight emerges in the act of inscription—and

reasoning from representation—where the produced artifact becomes an object of collective reflection, revision, and validation. We observed that the pictorial medium supports children in managing the dual epistemic demands of correspondence (alignment with observed phenomena) and coherence (internal consistency within the emerging representational system). Intellectual realism frequently characterizes these productions, as students depict not only what they see but what they consider conceptually relevant. In this sense, drawing functions as a conceptual change strategy: it renders implicit models visible, making intuitive ideas and resources available for discussion and restructuring. At the same time, our analysis highlights potential didactic pitfalls, including procedural reductionism (where drawing collapses into task reproduction) and semiotic hybridization without shared conventions, which can hinder model stabilization. The findings therefore, underscore the need for intentional multimodal orchestration across pictorial, verbal, and symbolic representations. When pedagogically scaffolded, drawing becomes a powerful ontological disambiguator and a central mediator in the construction of robust scientific knowledge in primary education.

Keywords: *Scientific reasoning, drawing, semantic tool, physical babbling, multiple representations.*

AI AND INTERNET USE AND THEIR ASSOCIATION WITH MEMORY AND COGNITIVE AUTONOMY IN PRE-UNIVERSITY EDUCATION IN ROMANIA

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Abstract
This paper examines the relationship between the use of the internet and artificial intelligence (AI) and cognitive processes related to memory, critical thinking, and cognitive autonomy in the context of pre-university education in Romania. The motivation for this research stems from the rapid expansion of digital technologies, which, while optimizing access to information and educational processes, may reshape users' cognitive strategies, particularly through memory externalization and reduced engagement in deep information processing. The study combines a theoretical review of recent literature with an empirical component conducted between December 2025 and January 2026, based on a sample of 313 respondents (students and teachers) from the counties of Dâmbovița, Ilfov, and Cluj. Data were collected through an online questionnaire and analyzed using quantitative methods, including hierarchical clustering (Ward.D2 method, Euclidean distance) and inferential statistical tests (ANOVA, Chi-square, Wilcoxon), in order to identify distinct cognitive and behavioral patterns. The results reveal the existence of three differentiated cognitive profiles: (1) an adaptive profile, characterized by moderate use of AI and relatively high cognitive autonomy; (2) a profile predominantly associated with teachers, marked by critical use of technology and high cognitive autonomy; and (3) a profile specific to students, characterized by a high tendency toward memory externalization and lower cognitive autonomy. Statistical analyses indicate significant differences between clusters in terms of cognitive autonomy ($p < .001$), while age does not significantly explain cluster membership ($p > .05$), suggesting that cognitive strategies and attitudes toward technology are more relevant than demographic factors. The findings should be interpreted in light of methodological limitations, including the use of self-reported data and the cross-sectional nature of the study, which does not allow for causal inferences. Nevertheless, the study provides a relevant contribution to understanding how AI use is associated with transformations in cognitive strategies in education and highlights the need for AI literacy, critical thinking development, and differentiated educational interventions.

Keywords: *Artificial Intelligence, memory, cognitive autonomy, education, learning.*

A QUALITATIVE INQUIRY INTO TRANSGRESSIVE PEDAGOGICAL PRACTICES AND THEIR ROLE IN ADDRESSING ANXIETY AND SOCIAL INEQUALITY IN STEM EDUCATION

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Abstract
Anxiety in Science, Technology, Engineering, and Mathematics (STEM) remains a persistent challenge within higher education, disproportionately affecting students from historically marginalised and under-resourced educational contexts. Such anxiety undermines students' confidence and academic performance and further reinforces existing social inequalities and barriers to meaningful participation in STEM fields. This qualitative inquiry examines the implementation of transgressive pedagogical practices as an intervention strategy to alleviate STEM-related anxiety and nurture resilience among preservice teachers at a South African institution of higher learning. The study was grounded in a transformative, social justice-oriented pedagogical theory, engaging STEM lecturers in a structured professional development programme that trained them to integrate coping strategies into their teaching practice as forms of transgressive pedagogy. The intervention unfolded through a series of workshops designed to create awareness of preservice teachers' lived experiences of STEM anxiety. Participants were encouraged to openly share their fears, academic struggles, and past negative encounters with STEM subjects, creating a safe and humanising learning space that disrupted traditional power dynamics within teacher education. Data were generated through reflective journals, focus group discussions, workshop artefacts, and semi-structured interviews. Using thematic analysis, the findings reveal that transgressive pedagogy promotes emotional safety, strengthens academic identity, and promotes agency among preservice teachers. Participants reported increased confidence, improved coping capacity, and a shift from a self-doubt–oriented perspective to one rooted in possibility, confidence, and sustained resilience. The study, therefore, contributes to a more equitable and inclusive teaching and learning culture in higher education. Implications for teacher education, curriculum transformation, and long-term STEM participation are discussed.

Keywords: *Anxiety, resilience, social justice, transgressive pedagogy.*

EVALUATION OF THE TUNNEL ENGINEERING COURSE LEARNING AND TEACHING WITH AI APPLICATION

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Abstract
As the powerful generative artificial intelligence (AI) is increasingly reshaping education modes, the education today is crucially intertwined with technology, such as in terms of educational content and pedagogy. It is vital to integrate AI in education to adapt to the potential of generative AI unsettling and upending in learning and teaching practice. However, in his transforming process, there is short of mature experience from practice to make the AI application increasingly effective, such as in terms of specific course learning and teaching. Here is the practice of the Tunnel Engineering course learning and teaching evaluation with the AI application under consideration. The evaluation focus on the student capacity building processes in AI-applied learning environments, with special reference to the cultivation of critical thinking. The experiences from the course learning and teaching procedures indicate that students are skillful in AI application to sample information to finish objective issues, while most of the students could not effectively manage the subjective issues, in which personal judgement and decision-making with various information are involved. When taking the advantages of AI application in this professional course learning and teaching, we should timely assess the potential misleading or temporary prosperity induced by the abundant multi-functional information that is blurring student cognition developing.

Keywords: *Evaluation, tunnel engineering course, learning and teaching, AI application.*

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UBUNTU-INFORMED MENTORSHIP MODEL: AFRICA PERSPECTIVES

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Abstract
This qualitative case study investigates the application of Ubuntu philosophy in doctoral supervision within South African universities, aiming to transform hierarchical supervisory dynamics into relational, dignity-affirming partnerships. The study examines how Ubuntu principles are reflected in daily supervisory practices and identifies organisational and interpersonal barriers that hinder their adoption. Adopting an interpretivist paradigm, the study employs a multiple-case design involving five supervisor-candidate groups from diverse disciplines, with data collected through semi-structured interviews and analysed thematically. Findings reveal four key themes: the clash between hierarchical and relational paradigms, mutual accountability as a foundation for trust, holistic support that acknowledges the whole person, and the dialogic co-construction of knowledge. While Ubuntu-aligned practices fostered collaborative dynamics and epistemic reciprocity, institutional barriers such as excessive workloads and neoliberal academic norms often undermined these efforts. The study contributes to a decolonial supervision model that integrates relational foundations, dialogic processes, and institutional enablers, challenging Eurocentric mentorship frameworks. By centring African epistemologies, this research advances the decolonisation of doctoral pedagogy and offers practical strategies for equitable, contextually responsive mentorship in higher education. The proposed model not only addresses power asymmetries but also redefines supervision as a mutually accountable, holistic partnership, thereby enriching global discourses on transformative academic mentorship.

Keywords: *Ubuntu-informed mentorship model, supervisor-candidate relationships, gatekeeper supervision model.*

WHERE LIGHT MEETS SHADOW: COMPARATIVE ANALYSIS OF HOLOCAUST EDUCATION IN ISRAELI AND AMERICAN CHILDREN'S LITERATURE

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Abstract
Across cultural and national contexts, educational systems play a central role in shaping how young learners first encounter traumatic historical events, a challenge that is particularly pronounced in the case of the Holocaust. This article examines how contrasting collective memories, Israel's heroic-national memory of the Holocaust and the American framing of the Holocaust as a universal moral event, are transmitted to young children through picture books centered on the Jewish holiday of Hanukkah. Based on a comparative analysis of 34 Israeli Holocaust picture books for early childhood, representing the full corpus published to date, and 20 books available to young readers in the United States, the study is situated within the global shift marked by the 2000 Stockholm Declaration, which positioned Holocaust education within an international moral discourse. The analysis demonstrates how children's literature actively constructs collective memory rather than merely reflecting it. Attention to narrative and poetic strategies reveals distinct pedagogical orientations in the two corpora. In American texts, Hanukkah is often reconfigured through familiar cultural symbols: candles, dreidels, and familial warmth, that function as affective mediators, framing the Holocaust within a gentle, nostalgic tone aligned with multicultural "holidays of light" discourse and inclusive educational settings. By contrast, Israeli works mobilize Hanukkah to reinforce a heroic-Zionist narrative that links ancient Jewish resistance to modern sovereignty. The miraculous dimension of the holiday is subordinated to themes of agency, national renewal, and collective responsibility, positioning the Holocaust within a broader framework of identity formation and civic socialization. By comparing these literary traditions, the study illuminates how curricular contexts and cultural narratives shape children's earliest encounters with the Holocaust and contributes to broader discussions of early Holocaust education that balance historical responsibility, developmental sensitivity, and cultural specificity.

Keywords: *Pedagogical ideology, elementary education, children's literature, cultural narratives, holocaust representation.*

INTEGRATING MULTICULTURAL PERSPECTIVES WHEN TEACHING HUMAN IMPACT ON THE ENVIRONMENT IN GRADE 11 LIFE SCIENCES

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Abstract
This paper explores the integration of multicultural perspectives in the teaching and learning of the Grade 11 Life Sciences topic *Human Impact on the Environment* within South African schools. Grounded in Ladson-Billings' Culturally Responsive Pedagogy and Vygotsky's social constructivist theory, the study adopts a qualitative interpretive research design to examine how culturally responsive approaches influence learner engagement and understanding of environmental issues. Data were generated through semi-structured interviews with three Life Sciences teachers, lesson observations, and focus group discussions with learners from three multicultural high schools in Gauteng Province. Thematic analysis revealed that teachers integrated multicultural perspectives through indigenous environmental practices, locally relevant and global case studies, and culturally informed classroom debates. Learners reported increased engagement, a stronger sense of inclusion, and improved ability to relate scientific concepts to their lived experiences. However, challenges such as limited instructional time, inadequate resources, insufficient teacher training, and tensions between cultural beliefs and scientific explanations constrained effective implementation. The findings suggest that integrating multicultural perspectives enhances the relevance and inclusivity of Life Sciences education by connecting scientific knowledge to learners' cultural and environmental contexts. The study concludes that sustained professional development, culturally inclusive curriculum materials, and stronger policy support are essential to promote equitable and culturally responsive science teaching that advances environmental awareness and sustainability education.

Keywords: *Multicultural perspectives, life sciences education, human impact on the environment, culturally responsive pedagogy, indigenous knowledge systems.*

INTEGRATION OF INDIGENOUS KNOWLEDGE IN THE TEACHING OF 'ANAEROBIC RESPIRATION' IN GRADE 11 LIFE SCIENCES

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Abstract
Indigenous Knowledge (IK), which encompasses the cultural practices, experiences, and knowledge systems of local communities, plays an important role in making science education more relevant and meaningful to learners. In the South African context, the Curriculum and Assessment Policy Statement (CAPS) advocates for the integration of Indigenous Knowledge Systems in Life Sciences teaching. However, the integration of IK into science classrooms remains limited, particularly in abstract topics such as anaerobic respiration. Anaerobic respiration is a fundamental biological process that is often perceived as difficult and abstract by learners, resulting in challenges in conceptual understanding. To address this challenge, the use of culturally familiar contexts drawn from IK has the potential to enhance meaningful learning. The study explored Life Sciences teachers' perspectives on the integration of IK in the teaching of anaerobic respiration in Grade 11. Guided by a qualitative research approach and framed within a phenomenological research design, data were collected from five Grade 11 Life Sciences teachers from different provinces in South Africa using online open-ended questionnaires. The data were analysed using thematic analysis. The findings revealed that teachers recognise the value of Indigenous Knowledge in promoting learner engagement and contextualised understanding through practices such as traditional beer brewing and food fermentation. However, the study also found that limited teacher training, insufficient resources, and a lack of clear policy guidance constrain effective classroom integration. The findings highlight the need for targeted professional development, resource provision, and stronger collaboration between schools and communities to support the meaningful integration of IK in Life Sciences teaching.

Keywords: *Anaerobic respiration, contextualised learning, indigenous knowledge, life science teaching.*

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HOUSING AS A LABORATORY OF SOCIAL DESIGN: SPATIAL APPROACHES AND NARRATIVES IN HIGHER EDUCATION

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Abstract
This article examines housing as a laboratory of social design in higher education, focusing on its pedagogical value within interior architecture education. Rather than approaching housing as a purely technical or typological issue, the study considers it a complex social and experiential field linked to dignity, access, care, everyday life, and the relationship between individual and community. The paper draws on theoretical content analysis of literature on housing, social design, and human-centered design, combined with teaching material from the Department of Interior Architecture of the University of West Attica, with particular emphasis on the courses Spatial Approaches and Spatial Narratives. The analysis shows that these two courses articulate complementary educational logics: the first emphasizes research, function, users, and spatial organization, while the second highlights meaning-making, narration, and the interpretive dimension of space. On this basis, the paper proposes a five-phase pedagogical model of the design process, including problem identification, interpretive research, concept formation, spatial application, and reflection with knowledge sharing. The study argues that housing can function as a productive field for socially oriented, research-informed, and critically reflective design education, while the studio may be understood as a learning community that fosters both spatial thinking and social awareness.

Keywords: *Social design, housing, interior architecture studios, pedagogical model, knowledge sharing.*

STUDENT-LED HEALTH WORKSHOPS: A LONGITUDINAL SERVICE-LEARNING MODEL FOR HEALTH EDUCATION IN HOMELESS SHELTERS

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Abstract
Increased health literacy has been linked to better long-term health outcomes. However, poor health literacy has been reported among people experiencing homelessness, contributing to lower health autonomy and greater reliance on emergency healthcare services. To address this gap, students at the University of Washington developed the Education Transforming Community Health (ETCH) program. This student-led service-learning program delivers health education workshops in homeless shelters. The purpose of this study is to evaluate the feasibility of developing and implementing a student-led health literacy program in shelter settings. From 2016 to 2026, undergraduate students were recruited and trained in trauma-informed engagement, intersectionality, and inclusive communication. Volunteers progressed through a structured Shadow-Support-Lead model designed to build teaching confidence and leadership skills. Workshops were conducted weekly (except June-August) at several homeless shelters in Seattle and covered topics such as nutrition, mental health, preventative care, and navigating free healthcare resources. Educational materials were also distributed through a publicly accessible website. Volunteer session logs were recorded through the TrackItForward platform. Additionally, a qualitative thematic analysis of volunteer reflections was conducted to identify patterns in shelter resident engagement and volunteer development. Since 2016, ETCH has involved over 140 student volunteers across six homeless shelters and logged 646.5 hours of educational outreach. Qualitative findings indicated consistent engagement among shelter residents, including participation in discussions, asking questions about personal health concerns, and retaining printed materials for use. Volunteers also reported progressive subjective confidence and skill development through the Shadow-Support-Lead structure. These findings suggest that student-led health education workshops are a feasible and promising model for improving access to health information while simultaneously supporting experiential learning for students.

Keywords: *Health equity, community engagement, health literacy, service-learning, homelessness.*

DIFFERENCES IN ORAL MOTIVATION AMONG JUNIOR HIGH SCHOOL STUDENTS IN THE DIGITAL AGE

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Abstract
This study investigates English oral self-directed learning motivation among 1,680 Chinese junior high school students, drawing on Self-Determination Theory (SDT; Ryan & Deci, 2020) and Bourdieu's capital theory. Oral motivation is conceptualised as a multidimensional construct comprising intrinsic motivation, extrinsic motivation (instrumental, social, normative), and amotivation. A convergent mixed-methods design combined validated questionnaires with 61 semi-structured interviews. Three hypotheses were tested: (H1) digital capital, family cultural capital, and school digital teaching positively correlate with motivation; (H2) significant group differences exist across urban/rural location, school type, and family SES; and (H3) digital capital's usage dimension shows the strongest correlation with intrinsic motivation. Overall motivation was moderate (M = 3.21), with extrinsic motivation (M = 3.35) exceeding intrinsic motivation (M = 2.98). All hypotheses were supported. All three capital forms correlated positively with motivation (r = 0.40–0.46), and urban, key-school, and high-SES students demonstrated significantly higher motivation. This study's original contribution lies in simultaneously modelling all three capital forms as predictors of SDT-informed oral motivation dimensions across multiple sociodemographic gradients in a large national sample. Findings call for targeted interventions enhancing digital skills, family language environments, and school digital support—especially for rural, ordinary-school, and low-SES students.

Keywords: *English oral motivation, digital capital, family cultural capital, group differences, junior high school students.*

BRIDGING CAPS POLICY AND ASSESSMENT PRACTICE FOR CRITICAL THINKING IN EKURHULENI NORTH ECONOMICS

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Abstract
South African Economics teachers are expected to develop learners who can analyse economic information, solve problems and make informed decisions, yet the 2024 National Senior Certificate Diagnostic Report shows that many candidates still struggle with higher-order questions that require analysis, comparison and explanation. This paper examines how FET Economics teachers in Ekurhuleni North understand and enact critical thinking within CAPS-aligned teaching and assessment, and which classroom, assessment and learner-context conditions enable or constrain this work. Guided by an adapted Paul and Elder critical-thinking framework, the study used a qualitative phenomenological design within an interpretivist paradigm. Data were generated through semi-structured interviews with three Economics teachers from public schools in Gauteng and document analysis of the Economics CAPS and the 2024 NSC Diagnostic Report. The interview data were coded thematically using Braun and Clarke's approach, with the framework's elements of thought and intellectual standards used as sensitising concepts. Findings show that teachers understood critical thinking as deep analysis, questioning, problem-solving and reasoned judgement. They attempted to promote it through learner-centred routines, including case studies, group discussion, budgeting tasks, scenario-based questions and explicit work with instructional verbs. However, these routines were constrained by curriculum pacing, overcrowding, limited resources, assessment practices that still privilege recall, uneven professional development and learner home-context pressures. The paper argues that critical thinking in Economics cannot be strengthened by policy intention alone; it requires assessment tasks, rubrics and professional learning communities that make reasoning visible within real classroom conditions.

Keywords: *Critical thinking, economics assessment, instructional verbs, CAPS, teacher pedagogy.*

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ORGANIZATIONAL ISSUES

WHY IS ENVIRONMENTAL EDUCATION IMPORTANT IN PRESCHOOL IN THE 21ST CENTURY?

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Abstract
Environmental education of preschoolers is not just a trendy direction in pedagogy. It is the education that forms the ability of children to understand and love the world around them and take care of it. Introducing nature to preschoolers is an important way of educating them in terms of environmental culture. It is important to lay the foundations of environmental education from early childhood as the main personality traits are laid in preschool age. Ecological education of preschool children is one of the fundamental problems of the theory of education and it is of paramount importance for educational work. In this study, we will examine why preschool environmental education is important in the 21st century. Within the scope, we benefited from many studies and articles and included important opinions. In order to understand the subject well, we first explained the subjects of environment and environmental education. I talked about why environmental education is important in preschool and what conditions should be met for children and included exemplary activities to improve environmental education in preschool. We researched what has changed in environmental education in this century and why environmental education is important. Finally, we expressed our own ideas and views on environmental education in the 21st century.

Keywords: *Environmental education, nature, childhood, preschool children.*

INSTITUTIONAL INEQUALITY AND GOVERNANCE CHALLENGES IN MEXICAN PUBLIC UNIVERSITIES

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Abstract
Mexican public universities have faced recurrent strikes and institutional disruptions, revealing deep-rooted governance and salary inequality challenges. This paper examines structural tensions within one of Mexico's most significant public universities, focusing on salary inequality, faculty aging, and governance conflicts. Using payroll records and demographic data, the analysis reveals widening disparities between senior administrative officials and certain academic personnel compared with the rest of the workforce. While top gross annual salaries exceed US $222,222.00, the institutional median remains near subsistence levels, fostering mistrust, labor unrest, and institutional fragmentation. This study draws on institutional payroll data, demographic trends, and documented events since the 2019 strike at the Universidad Autónoma Metropolitana (UAM), which lasted 92 days. It examines breaches of the Collective Bargaining Agreement, the growing reliance on highly paid managerial personnel ("personal de confianza"), and hiring patterns that undermine long-term academic sustainability. The findings highlight systemic contradictions in universities that publicly advocate social equity while internally reproducing economic hierarchies—inequalities that persist today. The academic workforce is rapidly aging: the average age of tenured professors is 60 years, over 20 % are above 70, and 54.9 % are older than 61, whereas only 12.8 % of the Mexican population is older than 60. Institutional data show a decline from 3,088 tenured professors in 2018 to 2,771 by the end of 2024. Without regulatory reforms, transparent salary structures, and strategic investment in early-career academics, public universities risk deteriorating academic quality, losing labor legitimacy, and weakening institutional credibility. This paper argues that higher education governance must prioritize equitable resource redistribution and long-term planning.

Keywords: *Higher education policy, salary inequality, institutional governance, academic sustainability, organizational change.*

EDUCATION AS A DOUBLE-EDGED WEAPON – SIGNIFICANCE AND CHALLENGES OF EDUCATION IN RURAL AND TRIBAL GIRLS' LIVES

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Abstract
This paper, based on my doctoral thesis, explores the significance of education in the lives of rural and tribal girls in India, situating it within a conceptualisation of education as a double-edged "weapon". It starts by critiquing the popular discourse on girls' education which paints an overly positive picture of the "triumphs" of educating girls, especially those located in the Global South, in bringing about social and economic progress. This discourse not only instrumentalises girls as indicators of national progress and development, it also fails to acknowledge the unique social as well as material challenges faced by marginalised girls in accessing and participating in formal education. Further, this discourse cannot fully capture the depth and nuances of marginalised girls' engagement with education, the significance education holds in their lives, and the questions it raises from a social justice perspective. Employing a participatory methodology that centres the voices and experiences of rural and tribal girls from the Nashik district of Maharashtra, India, this paper analyses the material and structural factors mediating girls' access to formal education, and the challenges as well as possibilities they produce for girls to go to school. Further to this, the paper also explores how education becomes another disciplinary structure in their lives, and the ways in which girls negotiate, resist, or reimagine their relationship to education in order to interrupt dominant narratives of education as an unquestioned vehicle towards progress. In doing this, this paper reimagines education as simultaneously a weapon of "destruction" linked to existing structures of power, as well as a weapon of "de-construction", enabling those who encounter it to "deconstruct", i.e. become aware of as well as collectively formulate critical and creative strategies to challenge the structural webs enmeshing all of us. Through this reimagination, I hope to nuance the connections made between education, development, and progress, which can inform education policy and programming from a social justice perspective. Finally, by highlighting the voices of marginalised girls who are silenced within development scholarship and policy discourse, the paper hopes to centre girls as knowledge producers and experts on their own lives and education, and create new methodological pathways for amplifying marginalised girls in education discourse and policy.

Keywords: *Girls' education, rural girls, participatory research, education policy.*

SCALING PERSISTENCE THROUGH STRUCTURED GOVERNANCE: INTEGRATING AI-ENABLED DIAGNOSTICS IN A HIGH-ENROLLMENT GATEWAY COURSE

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Abstract
Gateway courses function as critical persistence junctures in higher education, yet prevailing intervention models remain reactive, atheoretical, and insufficiently integrated into instructional decision-making. This paper introduces the Structured Governance Integration Model (SGIM), a domain-specific instantiation of the Human-Governed AI Operating Architecture™ (HG-AIOA), which embeds AI-enabled diagnostics within a four-layer governance structure to transform AI insight into authorized, equitable, human-executed instructional action. The study was conducted across four consecutive quarters of BUS100: Introduction to Business at Strayer University ($n > 2,700$ records) using a mixed-methods longitudinal design. SGIM deployment was associated with ~90% course completion rates sustained across three terms as enrollment tripled from approximately 500 to 1,400 students. The Learning Archetype Assessment (Carroll, 2023), anchoring the SGIM Diagnostic Layer, predicted persistence with high accuracy: in Quarter 3, only six students completing both intake instruments failed to finish the course. These findings reframe AI effectiveness in education as a governance property rather than a technological one, establishing HG-AIOA and SGIM as scalable, institutionally viable frameworks for aligning AI capabilities with human oversight in real-world learning environments.

Keywords: *AI governance, student persistence, gateway courses, learning archetypes, higher education.*

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INSTITUTIONAL SELF-EVALUATION AND CONTINUOUS IMPROVEMENT IN A PUBLIC TECHNOLOGICAL INSTITUTE: PROGRESS AND CHALLENGES WITHIN THE SEAES FRAMEWORK

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Abstract
Institutional self-evaluation has become a central mechanism of educational management in higher education, particularly in public institutions facing increasing demands for accountability, relevance, and quality assurance. This article analyzes the experience of a public technological institute in Mexico that implemented a comprehensive self-evaluation process within the System for Evaluation and Accreditation of Higher Education (SEAES). Adopting a critical educational management perspective, the study examines how self-evaluation functions as a governance tool to support continuous improvement, strategic decision-making, and academic leadership. A documentary and analytical methodology was employed, using institutional reports, quantitative indicators related to student trajectories, faculty professionalization, employability, and program performance, as well as qualitative evidence of social impact and institutional practices. The results show significant progress in aligning professional training with labor market needs and integrating environmental sustainability across programs. However, persistent challenges remain in terms of student completion rates, explicit incorporation of equity and inclusion, and the sustainability of external accreditations. The article argues that while SEAES provides a robust managerial framework, its effectiveness depends on strong internal governance structures, systematic monitoring, and a mature quality culture capable of transforming evaluation results into institutional learning and continuous improvement.

Keywords: *Institutional self-evaluation, educational management, continuous improvement, quality assurance, SEAES.*

THE PREDICAMENT OF MIDDLE LEADERSHIP IN SCHOOLS-NAVIGATING THE TENSIONS BETWEEN PEDAGOGY AND ADMINISTRATION

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Abstract
Middle leadership (ML) in schools epitomizes a critical yet a contested vital area where teaching and learning priorities and leadership and management accountabilities overlap. Middle leaders are sandwiched between the school management teams (SMT) and classroom teachers and expected to advocate for teaching and learning while fulfilling leadership and management and perform administrative duties at the same time. This amphibian expectation frequently builds constraints that dent who they are as professionals, task distribution, and ability to effect meaningful educational influence and change. This paper draws on both international and South African viewpoints to critically scrutinize the predicament of ML by traversing the tensions between pedagogy and administration. The discourse is anchored on three main theories of distributed leadership, role conflict, and concepts of instructional leadership. It foregrounds the attempt by middle leaders to reconcile their pedagogical obligation with the increase of administrative responsibilities, often resulting in the attention and priority of one area over the other. The international literature highlights common obstacles across numerous schooling systems. In South Africa unique challenges shaped by policy restructuring, unequal resource distribution and access, and systemic accountability frameworks are exposed by the literature review. The conclusion of the paper proposes strategies to support middle leaders through dedicated professional development, clearly defining their roles, and introducing policies that bring a balance between administrative responsibility and pedagogical leadership. In so doing, the paper contends that when properly supported, ML has the potential to change school culture and improve teacher leadership contributing and leading to enhanced learner academic outcomes.

Keywords: *Middle Leadership (ML), distributed leadership, role conflict, emotional labour, pedagogy.*

CASE STUDIES AS A TOOL FOR DEVELOPING ENTREPRENEURIAL SKILLS: COLLABORATION BETWEEN UNIVERSITIES AND INDUSTRY

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Abstract
Analysis of theoretical and empirical discourse allows to state that entrepreneurial skills and competences can no longer be treated only as professional competences, necessary only in certain areas. Today they are perceived as general, transversal competences, relevant in any field of activity or profession, as well as in personal life. For this reason, the development of entrepreneurial skills and competences should be included in most study programmes (especially in universities of applied sciences) or as a separate study subject (compulsory or freely chosen/free optional), or as a topic, or as a part of the study philosophy, which would be implemented through study methods, techniques, tools, resources, etc. In 2025 research was conducted at Šiauliai State Higher Education Institution (SVK). The participants of the research were students and teachers involved in entrepreneurship education. The research aimed to identify the main factors of entrepreneurship education that have the greatest positive impact on the development of students' entrepreneurial competencies, and to provide recommendations to higher education institutions (HEI) in the field of student entrepreneurial competencies development. The research showed that both when studying a separate study subject dedicated to entrepreneurship education and when integrating entrepreneurship education topics into other study subjects, the most positive impact is achieved by the applied study methods, among which the case analysis method occupies a special place. As the research showed, the case analysis method not only perfectly develops entrepreneurial skills and competencies, but also provides excellent opportunities for students to get acquainted with real-life situations, learn to solve them and thus be better prepared for real professional activities during their studies. The case analysis method also creates favourable conditions for cooperation between HEI and industry. As shown by the analysis of the results of the research such cooperation is beneficial for all the aforementioned partners in the study process: both students and the HEI and business enterprises. The solution of cases proposed by companies – as real practical situations, real business challenges – is not only a means of motivating and involving students. The solutions proposed by students, according to company representatives, often are applied in companies. The recommendations presented in the article will enable the improvement of the process of developing students' entrepreneurial skills and competencies, and the practical examples of the application of the case analysis method at the institution will likely encourage HEI teachers to pay more attention to the development of students' entrepreneurial competencies.

Keywords: *Entrepreneurial skills and competencies, case studies, higher education, university and industry collaboration, management of teaching/learning process.*

STRENGTHENING EDUCATIONAL PLANNING AND MONITORING SYSTEMS: INSTITUTIONAL CAPACITY BUILDING IN SÃO TOMÉ AND PRÍNCIPE

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Abstract
Educational planning, monitoring, and statistical systems are critical levers for strengthening governance, equity, and accountability, particularly in low-resource and aid-dependent contexts. In small island developing states such as São Tomé and Príncipe, persistent structural constraints—limited technical capacity, fragmented data systems, and reliance on external cooperation—restrict the effective use of data in policy processes. This paper examines a capacity-building initiative developed within the ERGUES Project (2024–2026), positioning it as an empirical case to analyse how training interventions interact with institutional conditions. The study is grounded in capacity development and evidence-informed policy perspectives, conceptualising capacity as a systemic construct that integrates individual competencies, organisational practices, and data use cultures. Methodologically, it adopts a qualitative case study design, combining document analysis, observation of training sessions, and structured participant feedback collected across modules. The analysis focuses on the design and early implementation of a modular

training programme targeting ministry technicians and decision-makers. The programme deliberately articulates conceptual input, applied data work, and policy-oriented case analysis to bridge the well-documented gap between technical knowledge and its institutional enactment. Moving beyond satisfaction metrics, the study mobilises indicators related to changes in data use practices, perceived applicability to decision-making processes, and the identification of organisational constraints. Findings demonstrate high engagement and strong perceived relevance, particularly in enhancing participants' recognition of data as a strategic resource for decision-making. However, the results also expose structural limitations that constrain impact, including insufficient analytical depth, limited digital infrastructures, and weak inter-departmental coordination. Crucially, the study evidences a persistent misalignment between individual capacity gains and institutional conditions, underscoring the limits of training-centred approaches when not embedded in broader organisational change processes. The paper advances the argument that capacity building in educational governance requires an integrated approach that aligns training with institutional reconfiguration, data system consolidation, and collaborative governance practices. By critically examining both advances and constraints, this study contributes to a more nuanced understanding of capacity development in resource-constrained systems and offers analytically grounded directions for future interventions.

Keywords: *Educational planning, monitoring and evaluation, institutional capacity, ERGUES, São Tomé and Príncipe.*

SECURITY, STRUCTURE AND LEARNER VARIABILITY: CORE DETERMINANTS OF TEACHING PROCESSES IN CORRECTIONAL EDUCATION

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Abstract
Teaching in correctional institutions takes place in both an educational and a criminal justice environment. In correctional institutions, security dictates the daily schedule, making the situation more difficult for teachers, who face serious challenges due to the closed institutional environment and the specific characteristics of the target group (Malvaso, Day & Boyd, 2024). The diverse psychosocial and learning needs of students in correctional institutions require a pedagogical approach that differs from the strategies used in traditional schools (Flores & Barahona López, 2021; Gagnon et al., 2025). In my research, during autumn of 2025, I asked teachers and educators at four juvenile detention centers in Hungary (Budapest, Rákospalota, Aszód, Debrecen) using semi-structured interviews. I conducted 32 interviews with teachers and analyzed them using Atlas.ti software. In this presentation, I will present the main findings of the interviews, focusing on the differences compared to traditional teaching in a regular school. The interviewees' responses can be divided into four main groups: teachers expressed their opinions on the differences in the teaching process, the closed environment, the curriculum, and the characteristics of the target group. According to the interviewees, teaching in correctional institutions is fundamentally determined by a closed, strict set of rules and the primacy of security protocols. Security regulations limit the range of pedagogical tools available and the organization of student interactions and often interrupt the continuity of teaching. The results of the interviews coincide with the findings of the literature regarding the focus of correctional education. The interviewees confirm that education is often more important than teaching itself, that the nature of teachers' administrative and organizational tasks differs from that in traditional schools, and that the work of teachers in correctional institutions is primarily determined by safety regulations, which overshadow a significant part of the usual school administration. According to teachers, the level of the curriculum in reformatory education must be lowered due to the significant knowledge and skill deficits of the students, as young people who end up in reformatories have serious knowledge gaps. The extremely heterogeneous composition of the students also poses a serious challenge, as young people arrive with different levels of prior schooling, resulting in complex educational needs. Based on the results of interviews with teachers, I will present how teaching in a correctional facility differs from teaching at other schools and what pedagogical strategies can be successful in this environment.

Keywords: *Correctional facility, teacher, difference, method, Janus face.*

TRANSFORMATIVE LEADERSHIP PRAXES FOR AFRICAN INDIGENOUS LANGUAGE REVITALIZATION THROUGH POLICY INITIATIVES

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Abstract
Recent debates indicate that, although African Indigenous Languages (AILs) are significant in fostering cultural identity, and contributing to the transmission of unique knowledge, worldviews and traditions, the critical role of these languages is endangered. Significantly though, the United Nations (UN) affirmed 2022-2032 as the International Decade of Indigenous Languages (IDIL), drawing consideration to the revitalization and protection of indigenous languages across the globe. This paper aimed to cast a microscopic eye on transformative leadership (TL) praxes for AIL revitalization through policy initiatives. Through the lens of Ubuntu-inspired Linguistic Justice Philosophy (ULJP), texts in the *Pan South African Language Board* (PanSALB) *Language Policy* and the *Report of the South African Human Rights Commission* (SAHRC) on indigenous languages were dissected, having applied a human rights-based conceptual analysis. The conceptual insights derived from the analysis showed that educational leaders should dismantle language standardization and foster hybrid language practices toward shaping the visibility and use of marginalised languages. To provide clarity regarding these findings, this paper proposes a Transformative Leadership Language Revitalization Framework (TLFRF), showcasing how indigenous language revitalization can be considered as dignity-affirming and relational. The paper recommends that the revitalization of AILs should be considered as motivating African people to honour their history, embrace the present and silhouette a future founded on cultural pride, justice and dignity.

Keywords: *African indigenous languages, policy initiatives, revitalization, transformative leadership.*

GOVERNING TRANSNATIONAL QUALITY AND RESEARCH PARTNERSHIPS IN TRANSDISCIPLINARY PROGRAMMES: CHINA-ITALY INSIGHTS

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Abstract
The expansion of transnational education and research collaborations increases organizational complexity in universities, particularly in transdisciplinary programmes, where epistemic traditions, assessment norms, and cultures diverge. Coordinating such programmes across countries, such as China and Italy, amplifies misalignment risks in academic standards and research outputs, which are valued differently across disciplines and national evaluation systems. This paper presents a case study of a China-Italy undergraduate programme in Engineering-Industrial Design, drawing on the authors' empirical involvement, documentary evidence, partnership mappings, and triangulated thematic analysis, it examines curriculum and assessment alignment as well as research strategies within the context of disciplinary and national differences. The results show that compliance-based quality assurance and opportunity-led partnerships are necessary yet insufficient. Quality assurance often decouples from core academic practices like curriculum design, assessment, pedagogy, and faculty development. Research internationalisation risks leading to fragmented collaborations and misaligned publications without coordinated support. The undergraduate programme thus needs two integrated governance functions: Academic Quality & Transnational Alignment for curricular coherence, standards equivalence, assessment mediation, and site/partner coordination; Research Development & Strategic Partnerships for network building, partnership integration, and bridging research trajectories credible in both Chinese and Italian systems. This differentiation avoids overload while coordination fosters a unified academic identity. The study offers an empirical characterisation of alignment challenges in China-Italy transdisciplinary engineering-design programmes and a practical governance framework to enhance institutional capacity for collaboration and coordination.

Keywords: *Transnational higher education, academic quality, strategic partnerships, transdisciplinarity, China-Italy.*

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CARING FOR THOSE WHO CARE: PROFESSIONAL WELL-BEING AND BURNOUT AMONG EDUCATORS IN THE LEPS PROGRAMME IN ITALY

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Abstract
It is widely acknowledged that care work and educational support, which unfold within complex emotional landscapes, are among the professions at risk of burnout. This vulnerability is closely linked to the centrality of interpersonal relationships in educational practice, particularly in contexts characterised by high relational intensity. The contribution focuses on the experience of LEPS, namely the minimum levels of social services and provisions that public administrations are required to provide nationwide. In particular, the focus is on LEPS PIPPI Programme aims to guarantee every child the right to harmonious development within stable, safe, and supportive family environments through educational support for parents. Engaging with, observing and managing situations involving vulnerability, suffering and material and non-material poverty exposes care professionals to significant emotional, cognitive, psychological, behavioural and identity-related risks. Based on this premise, this paper presents the results of a questionnaire given to educators and social workers involved in implementing the LEPS PIPPI programme. The aim is to investigate the emotional and relational impact of educational work within an intervention model that focuses on relationships with families, home-based work, co-constructing educational support pathways and integrated work within multidisciplinary teams. The study specifically explores perceptions of emotional workload, professional satisfaction, stress, and protective factors, as well as formal and informal support networks. The questionnaire consists of both closed and open questions and seeks, on the one hand, to capture practitioners' perceptions of care work within the LEPS PIPPI framework and, on the other, to encourage reflection on ways to strengthen organisational and training provisions focused on the well-being of care workers. Indeed, caring for those who care represents an essential component of educational welfare policies and practices. This is to prevent the risks inherent in the educational profession and enhance the effectiveness of interventions for families and children in vulnerable contexts, in line with a community empowerment and educational sustainability perspective.

Keywords: *Educational care, burnout, professional wellbeing, community pedagogy, prevention.*

MONITORING AND CONTROL PROCESSES INFLUENCING SOCIAL SCIENCES LEARNER PERFORMANCE IN SOUTH AFRICAN PRIMARY SCHOOLS

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Abstract
Effective curriculum management is a significant element of learner achievement. The study explores how monitoring (instructional support and teacher self-reflection) and control (accountability and policy compliance) processes in Grade 7 Social Sciences affect learner performance in primary schools within the Free State Province, South Africa. Grounded in Social Interdependence Theory, the research examines how collaborative dynamics between teachers and management foster positive interdependence to enhance educational outcomes. Adopting a qualitative phenomenological design within an interpretivist paradigm, data were collected through seven semi-structured individual interviews — comprising six Grade 7 Social Sciences teachers and one Department Head— across six primary schools. The study found that strong monitoring encourages professional growth, but systemic barriers such as inadequate infrastructure, inconsistent feedback, and stakeholder disengagement, often induce negative interdependence, undermining curriculum delivery.

Keywords: *Curriculum management, monitoring and control processes, learner performance, education in social sciences, primary schools.*

NAVIGATING UNKNOWN ACADEMIC EXPECTATIONS - SEEN THROUGH FIRST YEAR STUDENTS' LENSES

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Abstract
Beginning university studies often brings various mixed feelings of enthusiasm and uncertainty, particularly among first year students navigating unknown academic expectations, uncertain social integration, and sometimes yet-to-be-found self-identity in a new environment and even a whole new location. The paper observes first-year students' anticipatory feelings prior to entering university and contrasts these with their experiences during the first year at the uni. By examining the gap between expectations and reality, the study illuminates how students perceive their transition, and which aspects of university life require more support from educators and institutions. The data draw from thematic reflections collected during a phase of the orientation, where students were asked to articulate their pre-entry concerns and later evaluate how these concerns aligned with their actual experiences. The findings are triangulated through interviews. The work is to be concluded in the next few weeks, before the end of March. The analysis is expected to reveal a recurring set of fears: managing academic workload, feeling insufficiently prepared compared to peers, social isolation, and uncertainty about navigating institutional systems and practices, based on previous notions. Notably, students also occasionally, express doubts regarding self-discipline and balancing autonomy with responsibility, factors closely tied to emerging academic identity. The findings are hopefully able to show that while some fears persisted, many diminished as students encountered supportive learning communities, clearer guidance, and more flexible pedagogical structures. Peer interaction, freely on campus and amongst the 'tutor groups', structured introductory tasks, and transparent communication from teachers are features that are planned to encounter these phenomena. Hopefully they are able to play a key role in reducing anxiety and fostering a sense of belonging. However, whether certain concerns, such as time management and long-term academic self-efficacy, will remain as challenging as it seems to be anticipated, will be deemed at a later stage. Still, these may be seen as suggesting areas where early interventions could be strengthened. The paper contributes to ongoing discussions about student transitions by highlighting the importance of aligning institutional practices with students' emotional and cognitive readiness. Understanding first year students' perceptions offers educators valuable insight into how first-year learning environments can be designed to mitigate fear, promote confidence, and support students' early academic trajectories. The results may encourage universities to develop more explicit transition pedagogies that emphasize clarity, community, and guided autonomy.

Keywords: *First-year-students expectations, starting university, student guidance.*

LITERACY DEVELOPMENT IN JUVENILE CORRECTIONAL SETTINGS: EVIDENCE-BASED STRATEGIES AND CHALLENGES

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Abstract
Reading skills play a crucial role in cognitive development, academic success, and social integration. International research highlights that, although poor academic performance and reading skills are not direct causes of criminal behaviour, the proportion of young people with deficiencies in these areas is disproportionately high in correctional facilities. One way to reduce crime and recidivism is to provide young inmates with high-quality education that places a strong emphasis on developing reading skills. Research shows that there is a correlation between low educational attainment, low literacy levels, poor language and communication skills – especially reading comprehension difficulties – and high rates of crime and recidivism. Illiteracy is a common characteristic among juvenile offenders, with research examining the reading skills of this population reporting that young people in correctional facilities read at an average fourth-grade level (Brunner, 1993). Although illiteracy and low reading performance are not necessarily direct causes of crime, improved literacy through quality education in correctional facilities has been shown to reduce recidivism rates. I conducted a comprehensive search in several international databases (e.g., EBSCO Discovery Service, Web of Science, Scopus), focusing on English-language publications. The search terms consisted of the following combinations of keywords: ("juvenile

delinquency" OR "juvenile offenders" OR "youth offenders") AND ("pedagogy" OR "teaching" OR "teaching strategies" OR "teaching methods") ("qualitative" OR "quantitative" OR "mixed method"). In addition, I manually reviewed the references of relevant articles (snowball method) to find relevant studies on the topic. In my presentation, I examine what we know about the psychological and pedagogical significance of reading skills, whether there is a correlation between learning difficulties and deviant behaviour, what challenges need to be considered in reading skills development programs, and what positive examples and initiatives are known internationally. In my presentation, I attempt to synthesize the most important findings in international literature and present best practices that have been implemented in the field of reading skills development programs for young people. My research shows that improving the reading skills of young people in correctional facilities is far from hopeless; meaningful progress can be achieved even within limited time and challenging conditions. This, however, requires professionally grounded, intensive, individually tailored, and motivating programmes. When juvenile offenders experience improvement and success, their confidence grows and new possibilities open for them. Thus, reading development in correctional settings is not only a pedagogical task but a long-term social investment that contributes to reduced crime and improved life prospects.

Keywords: *Correctional facility, reading, literacy development.*

WORKSHOPS

TEACHERS AND STUDENTS

PREPARING TEACHERS TO ACHIEVE EDUCATIONAL EQUITY: LEARNING FOR ALL STUDENTS

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Abstract
Classrooms throughout the world are more diverse. Students differ in their language, culture, affluence, ability/disability, prior knowledge, religious beliefs. An educational system that requires same age peers learn the same content at the same time (i.e., the traditional grade level system) works against supporting the diversity of learners. This workshop will outline and provide opportunities to practice some of the critical elements teachers need competence with, in order to create personalized classrooms.

Keywords: *Inclusive education, personalized instruction, equity.*

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PROJECTS AND TRENDS

TAMING CHATGPT (AND OTHER AI BEASTS): DESIGNING A GENAI CODE OF CONDUCT FOR MEANINGFUL LEARNING

Jeroen Lievens
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Abstract
More than three years after the paradigm-breaking release of ChatGPT 3.5 in November 2022, many higher education institutions still struggle to position themselves towards GenAI. They are understandably reluctant to embrace tools that allow students to outsource cognitive processes and potentially bypass key learning outcomes. Yet a blanket ban is not realistic either, as GenAI is rapidly becoming indispensable in professional practice. Many institutions have therefore gravitated towards general policies calling for "responsible use." Well-intentioned as these may be, they often leave students uncertain about what is permitted. Some avoid GenAI altogether for fear of misconduct, while others use it liberally, creating uneven learning conditions. Moreover, generic policies may clash with teachers' intended learning outcomes: GenAI may undermine the learning value of some tasks while enriching it for others. What is needed is a clear and precise, yet flexible, framework that adapts to varied learning objectives while remaining consistent across courses. A customizable GenAI Code of Conduct — a document with a fixed structure but adaptable elements — offers such a solution. In this workshop, participants will explore how to develop and implement such a code collaboratively, ensuring student support and staff buy-in rather than imposing a top-down policy. Through discussion, collaborative critique, and hands-on guided design activities, we will explore effective content and formatting, drawing on a code co-developed by the engineering faculties of KU Leuven and Hasselt University (Belgium). Participants will leave with a first draft tailored to their particular context and a clear pathway to build support and integrate it across their faculty.

Keywords: *Generative Artificial Intelligence, ChatGPT, technology in education, educational policy, higher education.*

SAVING THE PLANET BY SAVING ENVIRONMENTAL EDUCATION. WHAT CAN ARTS-BASED PEDAGOGY OFFER?

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Abstract
Climate change has produced the hottest summers, worst droughts, wildfires and flooding ever recorded. Yet, Environmental Education (EE) and Education for Sustainable Development (ESD) have largely failed to generate levels of eco-literacy and citizen action necessary to address the climate crisis. In this interactive workshop the aims, systemic policies and pedagogy of EE and ESD are critically examined using a paired and snowballed group activity. Participants from all educational disciplines (maximum 32) and all age phases are welcome. Pairs are given a statement about aims, policies and practices of EE and ESD to debate, and then join a pair who have debated a corollary of that statement. As groups of four, emerging issues about relative effectiveness of EE and ESD approaches are argued and summarized by the workshop leader. Examples of Arts-Based Pedagogy (ABP) are shown that address issues emerging from group feedback. Participants work in pairs on different questions providing foundations for research to explore how ABP in EE might operate at different levels of the educational system. Participants leave with a sense of how the educational research and teaching communities might work together to help reinvigorate Environmental Education, providing routes for young people to act responsibly for sustainable futures. At a time when the turn to neoliberal populism is taking hold, threatening greening actions, this workshop is most timely. Bringing Environmental Education back to core principles of working for social justice, environmental protection, and addressing climate change are essential priorities for saving the planet.

Keywords: *Environmental education, sustainability, arts-based pedagogy.*

FACILITATING CLASSROOM DIALOGUE IN SEXUALITY EDUCATION THROUGH GAME–BASED LEARNING AND GENAI

Valeria Bruno[1], Giorgio Gaudio[2], Jeroen Lievens[3], & Björn Sjödén[4]
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Abstract
The purpose of this workshop is to explore how the content of human-to-human interactions compares to human-to-GenAI interactions, in the context of facilitating dialogue on topics related to Comprehensive Sexuality Education (CSE). CSE varies greatly between countries but generally fails to connect meaningfully to pupils' lived experiences. We introduce a new educational tool – the SexEdTalk card game – that facilitates open and age-appropriate conversations about sexuality in a safe, scientifically grounded, yet playful way. The game aims to foster: i) knowledge about sexual topics; ii) mutual understanding, respect, and empathy; and iii) insights into ideologically normative constructs and their consequences. It includes four decks: "Let's find out", 40 questions and answers; "Situations", 30 hypothetical experiences to discuss how to help or overcome difficulties; "True or False", 40 sentences to dismantle sexual myths; and "Let's talk about…", 10 keywords on specific topics often avoided. Because young people nowadays often turn to GenAI chatbots for advice on sexual topics, ChatGPT is introduced in the workshop as a virtual interlocutor. ChatGPT's answers and feedback will then be compared to those of the workshop participants and evaluated regarding: i) factual correctness; ii) social awareness and empathy; and iii) embedded ideological constraints or constructs. Based on these findings, participants will reflect on the broader pedagogical and ethical implications of using a GenAI tool as a persona to spark, moderate, or enrich class discussions. The workshop is designed for teachers working with students aged 14 and over and will include a maximum of 20 participants.

Keywords: *Sexuality, card game, ChatGPT, educational tool, teachers.*

A CASE STUDY ON TRAUMA-INFORMED CULTURALLY RESPONSIVE TEACHING: CORE CONCEPTS FOR SCHOOL PROFESSIONALS

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Abstract
Purpose: This workshop addresses the critical need for educators and helping professionals to develop competencies in supporting students affected by adverse childhood experiences (ACEs), intergenerational trauma, and socio-political adversities. Participants will acquire practical skills in implementing trauma-informed and culturally responsive (TICR) approaches within educational settings. *Background:* The workshop integrates the National Child Traumatic Stress Network's 12 Core Concepts for Understanding Traumatic Stress Responses (12 CCs) with SAMHSA's trauma-informed principles. Through problem-based learning (PBL), participants explore ecological factors influencing trauma response and recovery while developing strategies to mitigate secondary traumatic stress among educators and helping professionals. *Key Points:* Participants will: (1) apply the TICR framework to diverse educational contexts; (2) analyze multisystemic trauma impacts on student response and recovery; (3) consider risk and protective factors across ecological systems; and (4) identify TICR strategies to support educators, helping professionals, and students. *Methodology:* The 45-minute workshop employs a structured PBL approach comprising three phases: (1) didactic presentation introducing TICR framework and 12 CCs; (2) small-group case analyses using one case vignette and applying select CCs as analytical lenses for critical reasoning and case conceptualization; (3) small-group synthesis of insights and opportunities for participants to apply TICR framework to their own settings. *Participants:* Educational professionals including teachers, counselors, social workers, psychologists, and administrators. Maximum of 40 participants, ideally seated in groups to maintain optimal small-group dynamics.

Keywords: *Trauma-informed, culturally responsive, problem-based learning, secondary trauma.*

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TEACHING AND LEARNING

INTEGRATING ARTIFICIAL INTELLIGENCE INTO THE QUESTION FORMULATION TECHNIQUE (QFT)

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Abstract
Harvard University's Question Formulation Technique (QFT) is a useful tool that promotes reflection, critical thinking, and inquiry by engaging students in asking, analyzing, and reformulating their own questions. With the growing prevalence of AI, proponents of the QFT have wondered whether, and how, AI might be integrated into the QFT without diminishing student agency. This workshop aims to examine how adding AI to the QFT can explore additional perspectives and reveal blind spots in student questioning. This 30-minute workshop demonstrates how AI can complement, rather than replace, student inquiry when added to the QFT. Participants will examine how AI can deepen critical thinking skills by helping students compare their self-generated questions with those produced by AI, analyze differences, and identify new directions for inquiry. The workshop also highlights how AI can generate questions from alternative viewpoints, encouraging learners to consider multiple perspectives and nuanced ideas. The workshop is structured around interactive activities. Participants will first experience the QFT without AI. Next, they will engage in the QFT *with* AI, using tested prompts to generate additional questions and perspectives. Participants will then analyze and discuss the traditional and AI-aided QFT processes, as well as participant- and AI-generated questions, with attention to pedagogical implications. Through this process, participants will leave with strategies for blending the QFT with AI to foster deeper inquiry and critical engagement while maintaining student agency. This interactive workshop (max. 20 participants) is intended for those interested in promoting innovative questioning and inquiry. AI expertise is not required.

Keywords: *Question Formulation Technique, Artificial Intelligence, inquiry, critical thinking, pedagogy.*

AUTHOR INDEX