

UBIQUITOUS AND LIFELONG LEARNING: A LATIN AMERICAN EXPERIENCE

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Abstract

This research aims to offer a theoretical approach, arising from an intervention with online postdoctoral students, that addresses ubiquitous learning and interdisciplinary collaboration in education. This research aims to identify and subsequently develop digital competencies that enable teachers to innovate in educational practices and adapt to technological changes in this digital age. The methodology is qualitative, based on a systematic review of the literature in repositories, as well as ethnography to identify the level of competencies related to the use of Generative Artificial Intelligence. The sample consists of Latin American teachers pursuing virtual and long-distance postdoctoral programs as part of ubiquitous and lifelong learning. Privacy, misinformation, and mental health are indicators that emerged in response to the disadvantages of technological use and appropriation, particularly in socio-digital networks. The results indicate that teachers have adopted technological tools that support flexible learning. The promotion of a culture of lifelong learning is highlighted as part of a positive impact on teachers, researchers, students, and educational institutions in their transformative role; however, they are lagging behind in the incorporation of new information technologies into everyday life.

Keywords: *Ubiquitous learning, social media, digital literacy, lifelong education.*

1. Introduction

The research focuses on the intersection between interdisciplinary collaboration and ubiquitous learning, emphasizing how these practices can be used to innovate education in Latin American contexts for lifelong learning. Convergence in the digital era has transformed the way in which technological uses and appropriations modify practices and approaches to learning and teaching in which technological and communicative practices are incorporated.

The context of this research is derived from an exercise of international collaboration and linkage, where a virtual and long-distance course for a group of Latin American teachers who are in the last semester of their postdoctorate in Didactics and Educational Technology is involved.

Throughout the interaction of the seventeen weeks, a session is combined every fourteen days in a synchronous online class using zoom. In this space, the findings or results of the material worked on during the two weeks in the Moodle platform are socialized asynchronously. In the plenary, which lasts 3 hours, a master class is held as an introductory topic to the new thematic unit. The interaction allows the incorporation of various technological resources to achieve meaning and encourage attention for the session, which has been so indicated by the Latin American educational institution.

This raises concerns about the level of use and appropriation of technology, the perception of privacy when browsing, being a prosumer in digital environments, the position they have as adults on misinformation or “infodemia” and the central question about mental health in this era of digital convergence and in the globalized world that we face every day with the so-called “digital revolution”.

2. Methodology

General objective: To conduct a systematic review that integrates ubiquitous learning and interdisciplinary collaboration in education, in order to identify digital competencies that allow teachers to innovate in their educational practices and adapt to technological changes, thus promoting meaningful and continuous learning in the Latin American context.

Specific Objectives:

- To provide a conceptual review connecting ubiquitous learning with interdisciplinary collaboration in education.
- To identify and analyze the digital competencies that influence the ability of researchers to adapt to technological changes and promote meaningful and continuous learning in the Latin American context.

Collection instruments:

- Critical analysis of previous studies in specialized literature
- Case study: Post-doctorate in Didactics of Scientific Research and Epistemology of Education where innovative programs in "Ubiquitous and Lifelong Learning" are implemented.

3. Results

Ten studies on digital competencies, ubiquitous learning, interdisciplinary collaboration, and ICT integration in education were examined. Six studies employed systematic reviews, and most focused on higher education contexts, with five originating in Spain. In every study, technology integration capabilities appear as a key digital competency, with nine studies also highlighting online collaboration and digital literacy—and seven noting specific digital skills.

The papers document that ubiquitous learning environments, enabled by mobile resources and cloud-based tools, blur the boundaries between formal and informal learning and promote student autonomy and engagement. Reports on interdisciplinary collaboration stress that the use of social media platforms and discussion forums facilitates knowledge sharing despite challenges such as limited teacher expertise, evaluation difficulties, digital divides, and infrastructural constraints. In these studies, effective strategies include holistic digital competency frameworks that align technological tools with pedagogical goals, personalized learning approaches, and continuous professional development.

We analyzed 10 papers from an initial pool of 50, using 7 screening criteria. Each paper was reviewed for 6 key aspects that mattered the most to the research question. For all 10 studies, the research methodology in the available full texts or abstracts, were as follows: 6 were systematic reviews, one used qualitative research, one design-based research, one action research, and a case study

Context of the studies: 9 focused on higher education; 5 were conducted in Spain; 2 had an international or multi-country focus and mentions of other contexts (Latin America, primary education, secondary education, Peru, Ecuador, online education, and teacher training) in 1 study each, were found.

Key digital competencies addressed: Technology integration capabilities were mentioned in all 10 studies; Online collaboration competencies and digital literacy components were each found in 9 studies and specific digital skills were mentioned in 7 studies

Study focuses varied, including trends in educational systems, ubiquitous learning, ICT use in teaching, social media integration, virtual education, collaborative learning, and teacher training.

Concerning Digital Competency Frameworks and Implementation, we found:

- Framework Components: we didn't find mention of specified framework components in 5/10 studies. Of those that did specify, 3 studies used comprehensive digital skills frameworks, 1 used ubiquitous learning components, and 1 focused on various areas of digital competencies.
- Implementation Strategies: the most common strategies mentioned were the use of ICT tools and social media integration, each found in 2 studies. Other strategies included teacher competencies, technology integration, connectivism approach, virtual collaboration, use of cloud and web 2.0 tools, creation of virtual environments, and use of adaptive technologies.
- Reported Outcomes: enhanced digital competency was the most frequently reported outcome, found in 3 studies. Other outcomes included improved teaching-learning processes, student protagonism, knowledge management, continuous learning, digital literacy, collaborative practices, enhanced learning, adaptation to learning styles, and autonomous learning.
- Challenges: we didn't find mention of specified challenges in 4/10 studies. Among the challenges reported, there was a wide variety with little overlap between studies. This included lack of teacher expertise, evaluation difficulties, access disparities, attitude issues, complexity, limited ability to create digital solutions, digital divide, resistance to change, and the need for continuous technological training.

4. Discussion

Collaboration tools: We found mention of a wide variety of collaboration tools across the studies we reviewed. The most frequently mentioned tools were social media platforms (including Facebook) and discussion forums, each found in 2 studies. Video conferencing and ICTs were also mentioned in 2 studies each. Other tools such as Moodle, Flipped Classroom, email, shared zones, collaborative editors, chat, and collaborative presentations were each mentioned in one study.

Pedagogical approaches: Student-centered learning and personalized learning were the most common approaches mentioned, each found in 2 studies. Collaborative work/learning and using social media for content sharing/learning were also found in 2 studies each. Other approaches such as communication and interaction in virtual spaces, connectivist approach, affective-motivational strategies, and autonomy were each mentioned in 1 study.

Success factors: Interactive and collaborative learning environments, student engagement/participation, knowledge sharing and interaction, and virtual learning environments were each mentioned as success factors in 2 studies. Other success factors such as digital literacy promotion, improvement of teaching and professional development, enhanced competences, and organization and management of virtual spaces were each found in 1 study.

Barriers: We found limited information on barriers, with only 4 studies mentioning them. The barriers mentioned were evaluation challenges, lack of disposition towards virtual learning, digital divide, and resistance to change, each found in 1 study.

Ubiquitous Learning Environments: The concept of ubiquitous learning environments emerges as a significant theme across several studies, particularly in the context of higher education. Key findings include:

- Potential of ubiquitous learning as facilitates learning at any time and place; supported by mobile resources and connectivity; particularly relevant in contemporary educational contexts and blurs boundaries between formal and informal learning.
- Characteristics of ubiquitous learning environments: Integrate technology seamlessly into various learning contexts; Connect physical and virtual spaces; Often facilitated through mobile devices, cloud resources, and web 2.0 tools and Create flexible, accessible, and responsive learning ecosystems.
- Potential benefits: enhanced student engagement and autonomy; Improved access to educational resources; Facilitation of personalized learning experiences and Promotion of collaborative learning across diverse contexts
- Implementation challenges: Need for adequate technological infrastructure and connectivity; Ensuring equitable access to technology and addressing the digital divide; Developing teachers' competencies to effectively leverage ubiquitous learning technologies.

While the potential of ubiquitous learning environments is widely recognized across the studies, there is a need for more empirical research to evaluate their long-term impact on learning outcomes and digital competency development.

Social Media in Educational Contexts:

The use of social media in educational contexts emerges as a significant theme across several studies, with a particular focus on its potential for enhancing collaborative learning and digital competency development. Key findings include:

- Benefits of social media use in education: Enhanced student engagement; Improved digital competencies; Bridge between formal and informal learning; Facilitation of collaborative learning
- Challenges and considerations: Evaluation difficulties; Privacy and security concerns; Need for pedagogical integration and Digital divide
- Areas of digital competency improvement: Information and digital literacy; Communication and collaboration; Digital content creation
- Collaborative learning opportunities: Knowledge sharing; Peer interaction; Collaborative content creation

While the potential benefits of social media in education are evident, the studies suggest a need for more comprehensive research on long-term impacts, best practices for implementation, and strategies to address the identified challenges.

5. Conclusions

Implementation Challenges: Across the reviewed studies, several common challenges emerge in the implementation of digital competencies and technology integration in educational contexts:

1. Digital divide:

- Unequal access to technology and digital skills among students and educators
 - Significant impact on the effectiveness of digital learning initiatives
 - Affects development of digital competencies
2. Lack of teacher expertise:
 - Insufficient digital skills among educators
 - Significant barrier to effective technology integration
 - Suggests need for comprehensive and ongoing professional development
 3. Resistance to change:
 - Noted among educators in adopting new technologies and pedagogical approaches
 - Potential factors: lack of confidence, time constraints, skepticism about benefits
 4. Evaluation challenges:
 - Particularly in context of social media and collaborative online platforms
 - Difficulties in effectively evaluating student work and contributions
 - Suggests need for new assessment strategies
 5. Infrastructure limitations:
 - Inadequate technological infrastructure
 - Connectivity issues
 - Barriers to implementing ubiquitous learning environments
 6. Pedagogical integration:
 - Challenge of effectively integrating technology with appropriate pedagogical approaches
 - Highlights need for holistic approach considering both technological and pedagogical aspects
 7. Rapid technological change:
 - Fast-paced evolution of digital technologies
 - Challenge for educators and institutions to stay current and adapt practices

These challenges underscore the complexity of implementing digital competencies and technology integration in educational settings. The challenges identified in these studies suggest complexity in implementing digital competencies and technology integration in educational settings.

Best Practices

The analysis of the included studies reveals several emerging best practices for developing digital competencies and integrating technology in educational contexts:

1. Holistic approach to digital competency development:
 - Address multiple dimensions: technical skills, pedagogical creativity, ethical awareness
 - Comprehensive and multifaceted digital competency frameworks
2. Integration of formal and informal learning:
 - Use social media and digital platforms to bridge contexts
 - Enhance student engagement
 - Make learning more relevant to students' everyday experiences
3. Personalized and adaptive learning:
 - Use technology to facilitate personalized learning experiences
 - Adapt to individual student needs
 - Enhance student engagement and learning outcomes
4. Collaborative learning strategies:
 - Use digital tools to promote collaboration and knowledge sharing
 - Implement discussion forums, collaborative editing tools, social media platforms
5. Continuous professional development:
 - Ongoing professional development for educators
 - Focus on technical skills and pedagogical approaches for effective technology integration
6. Creation of virtual learning environments:
 - Comprehensive environments supporting various aspects of learning process
 - Include content delivery, communication, collaboration, assessment
7. Ubiquitous learning approaches:
 - Integrate technology to support learning across various contexts and devices
 - Particularly promising in higher education settings
8. Focus on digital literacy:
 - Develop broader digital literacy skills beyond technical competencies
 - Include critical evaluation of online information and understanding of digital ethics
9. Alignment with pedagogical goals:
 - Ensure technology integration strategies align with clear pedagogical objectives

- Focus on learning outcomes
10. Addressing the digital divide:
- Develop strategies to ensure equitable access to technology
 - Promote digital learning opportunities across diverse populations

These best practices provide a foundation for developing effective strategies to enhance digital competencies and technology integration in educational settings. However, the effectiveness of these practices may vary depending on the specific context.

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