

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.*

1. Introduction

The rapid integration of digital technologies into educational settings has fundamentally transformed the landscape of teaching and learning across all levels of education (Zou et al., 2025). Within this transformation, teacher educators occupy a uniquely critical position - they are responsible for developing their own digital competences and for modelling these competences to pre-service teachers, who will in turn shape the digital learning experiences of future generations (Momdjian et al., 2025). However, some research shows that newly qualified teachers report fairly poor quality and contribution of ICT training during their teacher education (Gudmundsdottir & Hatlevik, 2017). Therefore, the design and improvement of teacher training programs should be based on educational research to develop the pedagogical digital competence of student teachers (Gudmundsdottir & Hatlevik, 2017) and meet the evolving demands of digital education (Momdjian et al., 2025).

This paper reports the first stage of a capacity-building program aimed at enhancing digital literacy among teacher educators in Mozambique. This specific program is relevant because of the growing need for teachers in Mozambique to be equipped with digital education competencies across different fields. Grounded on educational research and local needs, it outlines the program's overall design. The framework that guides the program is also going to be presented.

2. Theoretical background

2.1. Developing educators' digital competences: Needs and challenges

A central pillar of university teachers' professional development is continuous training and the development of teaching competence across all dimensions. A major challenge for twenty-first-century university faculty is to remain engaged in continuous learning and research (Basilotta-Gómez-Pablos et al., 2022). In this line of reasoning, the development of digital competences among teacher educators has emerged as a significant area of scholarly inquiry and policy concern over the recent past (OECD, 2023). Teachers require, beyond general digital competencies for life and work, educator-specific digital skills to

use digital technologies effectively in teaching, as presented in the DigCompEdu, the European Framework for the Digital Competence of Educators (Redecker, 2017). However, higher education teachers acknowledge having low to medium-low digital competence and lacking certain skills—particularly those related to evaluating educational practice (Basilotta-Gómez-Pablos et al., 2022). Due to that reason, more practical and personalized training programs that respond to the needs of teachers in the digital era are needed (Basilotta-Gómez-Pablos et al., 2022).

Since each teacher's competence development depends on multiple factors, the first step in understanding teachers' training needs for the digital era is to identify their starting point and then respond to specific needs with proper training offer (Basilotta-Gómez-Pablos et al., 2022). Teachers need targeted, differentiated training to strengthen their digital competence, with a focus on pedagogical knowledge of digital resources and tools and on how to embed them effectively in teaching practice. (OECD, 2023). Additionally, it is crucial to recognize, accredit, and certify the teachers' digital competences. Implementing such processes requires valid, transparent tools not only for assessment but also for recognizing and accrediting teachers' formal, non-formal, and informal learning (Basilotta-Gómez-Pablos et al., 2022).

2.2. Digital competences development of educators in Mozambique

In Mozambique, the *Education Strategic Plan 2020–2029* promotes the use of ICT by teachers and students as interactive tools to facilitate teaching and learning, through the development of digital and multimedia curricular materials, for example (Ministério da Educação e Desenvolvimento Humano, 2020). Additionally, the *Strategic Plan for the Information Society 2019–2028* includes initiatives to train teachers and school principals in using ICT as a pedagogical tool. It proposes training and awareness-raising initiatives for teachers and school principals on the use of ICT as pedagogical tools that can improve learning and the development of Mozambican society, promoting an evolution in the teaching–learning paradigm (Conselho de Ministros, 2019).

Research shows differing levels of development in the use of digital technologies in higher education and secondary schools. In the context of higher education, a study conducted by Tumbo (2018) mapped the pedagogical use of digital ICTs by 30 specialized tutors teaching distance education at the Pedagogical University of Mozambique - Delegation of Niassa. Results revealed widespread ownership of computing devices and internet access, with usage ranging from weekly to daily (Tumbo, 2018). Tutors demonstrated considerable digital literacy, actively exploring software and web services relevant to teaching (Tumbo, 2018). These indicators suggest strong readiness for pedagogical integration of ICT in distance education and alignment with contemporary cybercultural practices (Tumbo, 2018). In contrast, and in the context of secondary education, research conducted by Caetano and Zaro (2018) showed that despite efforts to equip secondary schools with ICT, many lack adequate computers. 12 of 14 inquired schools only teach ICT theoretically, and some do not teach it at all. As a result, students graduate with unequal exposure and little practical ICT knowledge, undermining curricular goals and graduate quality (Caetano & Zaro, 2018). The previous findings reveal a clear divide between higher education and secondary education: higher education tutors show strong access and digital literacy, ready to integrate ICT pedagogically (Tumbo, 2018), while many secondary schools lack sufficient equipment and practical ICT instruction, leaving students with unequal and inadequate digital skills (Caetano & Zaro, 2018).

2.3. The role of frameworks, guidelines and standards

National and international frameworks have increasingly sought to articulate expectations for educators' digital competences and guide professional development efforts. One such framework is the DigCompEdu which aims to identify and describe these educator-specific competencies, distinguishing six different areas in which educators' digital competence is expressed, with a total of 22 competences (Redecker, 2017). This framework provides a common vocabulary and reference point for discussing digital competence while offering a progression model that recognizes different levels of proficiency (Redecker, 2017). The DigCompEdu framework has been widely adopted across European contexts and adapted for use in numerous national settings.

Also in the European context, the European Commission published *Guidelines on the ethical use of artificial intelligence and data in teaching and learning for Educators* to help teachers and school leaders make informed choices and develop the skills needed to an ethical use of AI, and leverage AI while managing potential risks (European Commission, 2026).

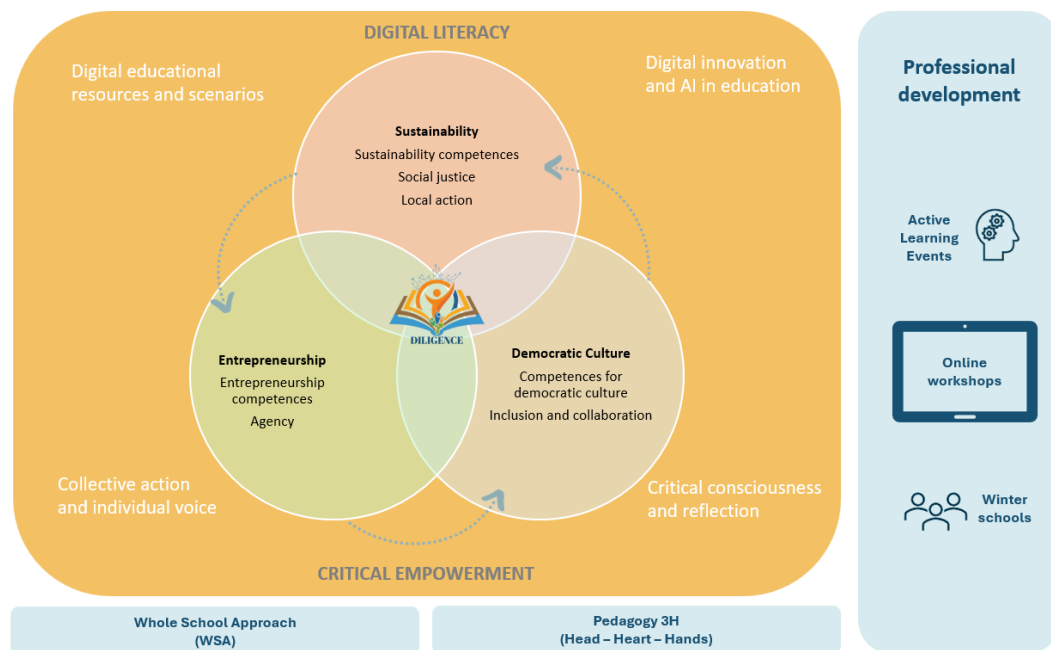
In the United States, the *International Society for Technology in Education (ISTE) Standards for Educators* provide guidance for technology integration that has been influential in education contexts (Crompton, 2023). These standards emphasize not only technical skills but also pedagogical approaches such as designing authentic learning experiences, facilitating student-driven learning, and modelling digital citizenship. Crompton (2023) found that practices aligned with the *ISTE Standards for Educators* were associated with learning gains.

However, a difficulty is that, while other education sectors long had standards for digital knowledge, skills, and dispositions for students, teachers, and administrators, the field of teacher education has only recently developed such guidelines (Carpenter et al., 2020), such as the *Teacher Educator Technology Competencies* (TETCs) (Foulger et al., 2017). TETCs were developed to define the knowledge, skills, and attitudes teacher educators need to prepare teacher candidates to become technology-using teachers (Foulger et al., 2017).

3. DILIGENCE framework: Enhancing digital literacy and critical empowerment of educators in Mozambique

This section presents the DILIGENCE framework, which will guide capacity-building of educators' digital competences aimed at critical empowerment in Mozambique (Figure 1). The framework was co-created by a collaborative team of European and Mozambican teacher educators, following discussion of Mozambique teacher educators' digital capacity needs. Additionally, the Pedagogical Steering Group of DILIGENCE' project gave relevant insights to improve the framework. The participants in DILIGENCE online training are teacher educators from three Mozambique' high school teacher education institutions - Pedagogical University of Maputo, Rovuma University, Púnguè University - and their primary teacher training institutions partners. This framework is a work in progress and will continue to evolve in response to educators' needs in a rapidly changing digital world.

Figure 1. DILIGENCE framework.



The DILIGENCE framework aims to offer a structured approach to fostering digital literacy among educators in Mozambique, as the ability to effectively, critically, and responsibly engage with digital technologies, and critical empowerment. This will enable educators and their students to become active, reflective, and socially responsible actors in an increasing digital world. The DILIGENCE framework centres on three domains to empower educators and learners: Sustainability, Entrepreneurship, and Democratic Culture. Sustainability cultivates GreenComp-aligned competences (Bianchi et al., 2022), understanding of global/local challenges, and engagement in local action to promote environmental and social responsibility. Entrepreneurship develops EntreComp-based competences (Bacigalupo et al., 2016) – such as agency, initiative, creativity, innovation, and social/civic entrepreneurship - to identify opportunities and drive positive change. Democratic Culture competences (Council of Europe, 2018) are based on values, attitudes and skills for democracy, collaboration, respect for diversity and human rights, and civic participation to prepare active, responsible citizens. This framework aims to equip young people, educators, and schools in Mozambique to respond effectively to contemporary challenges, by linking competence development, and pedagogical practices, such as the Whole School Approach (WSA) and the Pedagogy 3H (Head-Heart-Hands). Professional development for participants will be driven by a three-dimensional strategy: active learning events, an online course, and winter schools.

4. Online course structure

The online course was co-created through international collaboration among the project's partners. It is organized into 4 themes, 10 modules, and 20 online workshops (Table 1).

Table 1. Structure of the online workshops of the DILIGENCE project.

Themes		Modules	Online Workshops
Introduction		1. Project overview and introduction to the project's learning management system platforms.	1
Theme 1	Foundations of digital competences	2. to 4. Overview of digital competences foundations (Digital competences for educators, 21st century skills, DigCompEdu, Collaborative Online International Learning, Virtual Collaborative Learning).	2 to 7
Theme 2	Digital competences in learning scenarios for critical capacitation	5. Introduction to learning scenarios 6. Learning scenarios and digital tools 7. Active educational approaches in digital learning environments	8 to 13
Theme 3	Artificial Intelligence	8. Use of artificial intelligence for critical and digital training	14 to 16
Theme 4	Put into practice	9. Creation of context-focused digital learning scenarios 10. Training of future teachers and in-service teachers	17 to 20

An introductory online workshop covers the project overview and presents the project's learning management system platform. Then, each workshop will include synchronous moments and asynchronous work. The online training will run from March 2026 through February 2027.

The overall learning goals are to build teacher educators' digital competence in Mozambique to design, deliver, and evaluate technology-enhanced learning. Developing their critical empowerment ability to assess social/ethical implications of digital tools, and equip them to create context-appropriate, practice-based digital learning scenarios for training future/in-service teachers, are also desired goals.

5. Conclusion

This work reports a targeted capacity-building initiative to strengthen digital literacy and critical empowerment among Mozambique's teacher educators. Grounded in research and international frameworks (DigCompEdu, EntreComp, GreenComp), the DILIGENCE framework guides this capacity building program and integrates sustainability, entrepreneurship, and democratic culture through active, practice-oriented learning. Online workshops, active learning events, and winter schools will guide educators from foundational competences to context-specific learning scenario design, the use of AI, and the transfer of the knowledge and skills developed to their own practice.

With this capacity building program in the field of higher education, the outcomes expected are improved teacher educators' digital competences in Mozambique, and greater confidence and frequency of pedagogical technology use in their own practice. Consequently, it is expected that future teachers taught by these teacher educators will be better prepared to integrate digital tools pedagogically, demonstrate practical and ethical digital skills (including informed use of AI), design learner-centred and context-relevant digital learning experiences. The promotion of sustainability, entrepreneurship, and democratic competences with the use of digital tools in their classrooms is also an expected outcome.

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