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Digital Pedagogical Competence: Preparing Teachers for Classrooms of the Future A Study in the Western Balkans (Albania, Kosovo, and North Macedonia)

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ABSTRACT

The educational system in the Western Balkans, especially in North Macedonia, Kosovo, and Albania, is going through significant changes to include technology into teaching and learning procedures in an era characterized by digital revolution. This article examines the idea of digital pedagogical competency, its applicability in modern classrooms, and the ways in which teachers in the aforementioned nations are adjusting to the needs of education in the twenty-first century. This study attempts to offer insights and suggestions for equipping teachers with the abilities required to succeed in digital classrooms by utilizing recent case studies, national policies, and empirical data.

1. Introduction

A key component in modern education is the idea of "digital pedagogical competence," which implies the incorporation of digital tools into the teaching and learning process. Beyond just technical proficiency, this competency includes the capacity to choose, use, and assess digital resources critically in ways that promote meaningful learning outcomes, differentiated instruction, and increased student engagement. The need for educators who are proficient in digital technology is growing quickly as global education systems deal with the benefits and problems brought about by the Fourth Industrial Revolution. Digital skills are now necessary for both instructors and students to navigate a constantly changing educational landscape, according to the European Commission (2022).

European integration processes, state policy reforms, and worldwide trends have all impacted the impetus behind the digital transformation of education in the Western Balkans. A variety of strategic initiatives have been launched by nations including Albania, Kosovo, and North Macedonia with the goal of incorporating digital education frameworks. These consist of the creation of ICT regulations, the implementation of online learning environments, and initiatives to increase teacher proficiency. However, enduring issues—like unequal internet access, inadequate rural infrastructure, uneven policy implementation, and a lack of professional development—continue to impede advancement.

This article examines how these three nations are tackling these problems and giving teachers the tools they need to succeed in classrooms that are enhanced by technology. In order to guarantee robust, inclusive, and future-ready educational systems in the area, the conversation highlights both advancements made and gaps that need to be filled by looking at national plans, teacher training programs, and continuing challenges..

2. Defining Digital Pedagogical Competence

The ability of educators to successfully incorporate digital tools and resources into their teaching methods in order to improve learning outcomes is known as digital pedagogical competency.

It includes aspects related to technology, education, and ethics, such as:

• Technological literacy • Pedagogical approaches tailored to digital contexts

• Online evaluation techniques; • Data security and digital ethics;

• Digital content production (Redecker, 2017)

DigCompEdu, which stands for the European Framework for the Digital Competence of Educators, constitutes a foundational model that is utilized for the purpose of evaluating and developing these competencies. Professional engagement, digital resources, teaching and learning, assessment, empowering learners, and facilitating learners' digital competency are the six categories into which it divides digital competency (Redecker & Punie, 2017). According

to Ilomäki et al. (2016), cultivating these competences is crucial for promoting lifelong learning and professional development among educators in addition to improving pedagogical practices.

Furthermore, the confluence of technological, pedagogical, and content knowledge is pointed out by Koehler and Mishra's (2009) TPACK framework, which emphasizes that subject-specific practice is the foundation of effective digital pedagogy and that it is context-dependent.

3. Digital Pedagogical Landscape in the Western Balkans

3.1 North Macedonia

ICT integration in education has advanced in North Macedonia, especially because to programs like the National Strategy for the Development of Education 2018–2025. Digitally focused teacher professional development is emphasized by the Ministry of Education and Science (MES, 2021). Access to digital resources and connectivity in remote areas are still problematic, though.

According to a research by Spasovska (2022), just 35% of instructors feel they have received enough training, even though 72% of them report regularly using digital technologies. The need for more comprehensive professional development programs is shown by this disparity. Ivanovska (2020) emphasizes that digital competency is still dispersed and mostly reliant on school-specific activities. Implementation deficiencies are made worse by uneven policy enforcement and a lack of interministerial cooperation, claim Trajkovski and Vasileva (2022).

3.2 Kosovo

The educational system in Kosovo has demonstrated an increasing dedication to digital change. The goal of the Kosovo Education Strategic Plan (KESP) 2017–2021 was to enhance teacher preparation and digital infrastructure. Positive trends are highlighted by initiatives like "SchoolMe" and the incorporation of Google Workspace in schools, despite political and financial obstacles.

According to a GIZ and MEST (2021) survey, just 22% of instructors had access to structured programs, despite 67% of teachers expressing interest in digital pedagogical training. According to Krasniqi & Maliqi (2022), teacher preparation programs frequently place more emphasis on technical proficiency than pedagogical application, which restricts the efficient use of technology in the classroom. Additionally, according to Berisha and Morina (2023), Kosovo's digital transformation is mostly dependent on donor-driven experimental projects and lacks a clear national vision.

3.3 Albania

Albania has started a number of projects to digitize its educational system, such as the national education portal Akademi.al and the "Smart Lab" project. In partnership with foreign organizations, the Ministry of Education has launched DigCompEdu-aligned teacher training modules. A research by Kotorri (2021) found that more than half of Albanian teachers rely on informal learning to develop digital competency in spite of these efforts, suggesting a lack of institutional support and structured training. According to Leka and Gjika (2020), despite the growing availability of digital technologies, their incorporation into instruction is still only superficial in the absence of specialized pedagogical training. Only 38% of teachers in rural Albanian schools have reliable internet connectivity, according to recent research by Hoxha and Peci (2023), making even simple online education difficult.

4. Case Study Analysis

We examined secondary data from teacher training programs and pilot schools in each nation, as well as conducted interviews, to gain a deeper understanding of the state of digital pedagogical competence. These cases illustrate how educational initiatives in North Macedonia, Kosovo, and Albania are navigating digital transformation at the institutional level.

Case Study 1: North Macedonia – Skopje Secondary School Initiative

A significant pilot initiative was started in a number of Skopje secondary schools in North Macedonia to encourage the use of digital technologies in the classroom. Digital classrooms were outfitted with interactive whiteboards, tablets, student response systems, and personalized e-learning platforms as part of this project. With the help of EU-funded programs, teachers got organized training that included both the pedagogical and technical uses of digital tools.

Post-intervention assessments indicated a measurable improvement in student engagement and learning outcomes, particularly in science and mathematics. Teachers reported that interactive content fostered student participation, while digital tools allowed for more differentiated instruction. Students showed greater enthusiasm for class discussions and increased collaboration through shared documents and virtual classrooms. However, the program faced setbacks due to limited technical support after initial implementation. Many educators expressed concerns over the lack of refresher courses and mentoring support once the training phase concluded.

Additionally, schools in rural Skopje municipalities experienced inconsistent results due to insufficient internet bandwidth and limited access to hardware. According to Stanoevska-Slabeva et al. (2019), successful digital integration in schools requires not only a robust initial setup but also a sustained commitment to continuous professional development and institutional support.

Case Study 2: Kosovo – Digital Training with the Kosovo Education Center (KEC)

The Kosovo Education Center (KEC) implemented a hybrid learning model for upskilling teachers in digital pedagogical practices. Teachers across various municipalities participated in a six-week program combining asynchronous online learning modules, webinars, and in-person workshops. The training curriculum focused on digital literacy, integrating technology into lesson planning, and using tools for online assessment.

The frequency and variety of digital formative assessments utilized in classrooms increased by 45%, according to evaluations done three months after the training. For example, it was more common to use technologies like Padlet, Google Forms, and Kahoot! to assess student understanding and modify education accordingly. Teachers who took part also expressed greater confidence in their ability to use instructional software and multimedia materials.

Nevertheless, systemic barriers limited the program's overall effectiveness. A persistent issue was the lack of reliable internet access, especially in rural areas. Moreover, elderly educators struggled with the transition to digital teaching due to limited prior exposure to technology. According to Dervishi and Kika (2021), such generational gaps in digital competence require tailored training strategies, including mentorship from younger, tech-savvy colleagues and age-sensitive instructional design.

In response, KEC created a peer support network and follow-up webinars so that participants could work through issues together. However, without national policy support and ongoing investment, long-term viability is still doubtful..

Case Study 3: Albania – Akademi.al Integration in Tirana Schools

In Albania, the Ministry of Education's collaboration with the digital learning platform Akademi.al has shown encouraging results, particularly in urban centers like Tirana. This platform allows educators to access curriculum-aligned content, upload lesson plans, and facilitate hybrid learning models. During the 2022–2023 academic year, over 70 urban schools integrated Akademi.al into their classroom routines.

Teachers reported improvements in classroom time management, streamlined grading, and personalized student feedback. The platform's analytics tools enabled educators to track student progress in real time and provide differentiated support. Many teachers also used the platform to assign creative multimedia homework, increasing student motivation and technological fluency.

However, a significant digital divide persists between urban and rural schools. In northern and southern rural regions, many schools lack the infrastructure necessary to fully adopt the platform. Teachers often resort to improvising lessons without consistent internet or devices. Muka and Dhamo (2020) argue that national digital initiatives must be coupled with infrastructure equity to prevent the exacerbation of educational disparities.

In follow-up interviews conducted in May 2024, several Tirana-based educators emphasized the importance of localized, culturally relevant digital content. "Using general web resources doesn't address our curriculum," one teacher stated. "We need more Albanian-language materials tailored to our students' context." This call highlights the importance of both linguistic relevance and alignment with national education standards in digital resource development.

Furthermore, the instance revealed the importance of teacher attitudes in the successful implementation of digital technologies. Educators who saw technology as a benefit rather than a hindrance were more likely to try new ways. Continued professional learning networks and access to localized educational materials were deemed critical for maintaining momentum.

Overall, these three case studies show potential but inconsistent progress in creating digital pedagogical competency in the Western Balkans. While pilot efforts indicate the potential of digital tools to improve instruction, long-term success depends on ongoing training, infrastructure investment, and policy coherence across all levels of the education system.

5. Key Challenges and Gaps

Common difficulties in all three countries include:

• Digital Infrastructure: Reliable internet and devices are scarce in rural and underdeveloped areas.

• Teacher Training: Current programs frequently lack pedagogical depth and are brief.

• Policy Implementation: There is a disconnect between the creation of policies and their implementation at the school level.

• Evaluation: Insufficient knowledge of digital evaluation techniques.

• Equity and Access: Teachers and students from underrepresented groups encounter extra obstacles when it comes to online education.

• Localized Content: There is a dearth of native-language digital learning materials.

6. Recommendations

The following recommendations are made in light of the findings:

1.DigCompEdu-aligned national frameworks: Create regionalized iterations of the DigCompEdu framework to direct teacher preparation and assessment.
2. Sustainable Training Programs: Create ongoing professional development courses that emphasize both technical and pedagogical elements and combine online and in-person settings.

3. Public-Private Partnerships: Make use of tech firms to supply infrastructure, resources, and mentorship.

4. Infrastructure Investment: Using specific government and donor funds, give rural communities priority access to hardware and broadband internet.
5. Monitoring and Evaluation: Use data-driven methods to evaluate the effectiveness and expandability of programs aimed at fostering digital competency.
6. Peer-to-Peer Learning Networks: Promote practice groups among teachers to exchange materials and experiences.

7. Curriculum Development: Encourage the production of digital content that is in line with national standards and culturally appropriate.

8. Inter-Ministerial Collaboration: Encourage cooperation between the finance, technology, and education ministries to guarantee a thorough implementation of policies.

7. Conclusion

Digital pedagogical competency is no longer a luxury; it is an absolute must for educators navigating the complexity of 21st-century education. As technology becomes more integrated into all aspects of life, instructors must be equipped not only with topic knowledge but also with digital skills and pedagogical practices in order to provide effective, engaging, and inclusive learning opportunities.

Countries in the Western Balkans, including North Macedonia, Kosovo, and Albania, are making praiseworthy efforts to integrate digital technologies and approaches into their educational institutions. National policies, experimental programs, and donor-funded initiatives have all exhibited strong political will and a rising realization of the need for systemic change. To fully exploit the benefits of digital pedagogy, more comprehensive and long-term efforts are required.

Investing in focused teacher training, guaranteeing access to dependable digital infrastructure, offering inclusive resources to all students—including those in underserved or rural communities—and incorporating digital competency standards into frameworks for professional development and initial teacher education are important areas.

These countries may create education systems that are more robust, flexible, and prepared for the future by giving priority to the development of digital pedagogical competency now. In addition to improving the quality of instruction, closing the digital competency gap guarantees that students are ready for the needs of an increasingly digital world.

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