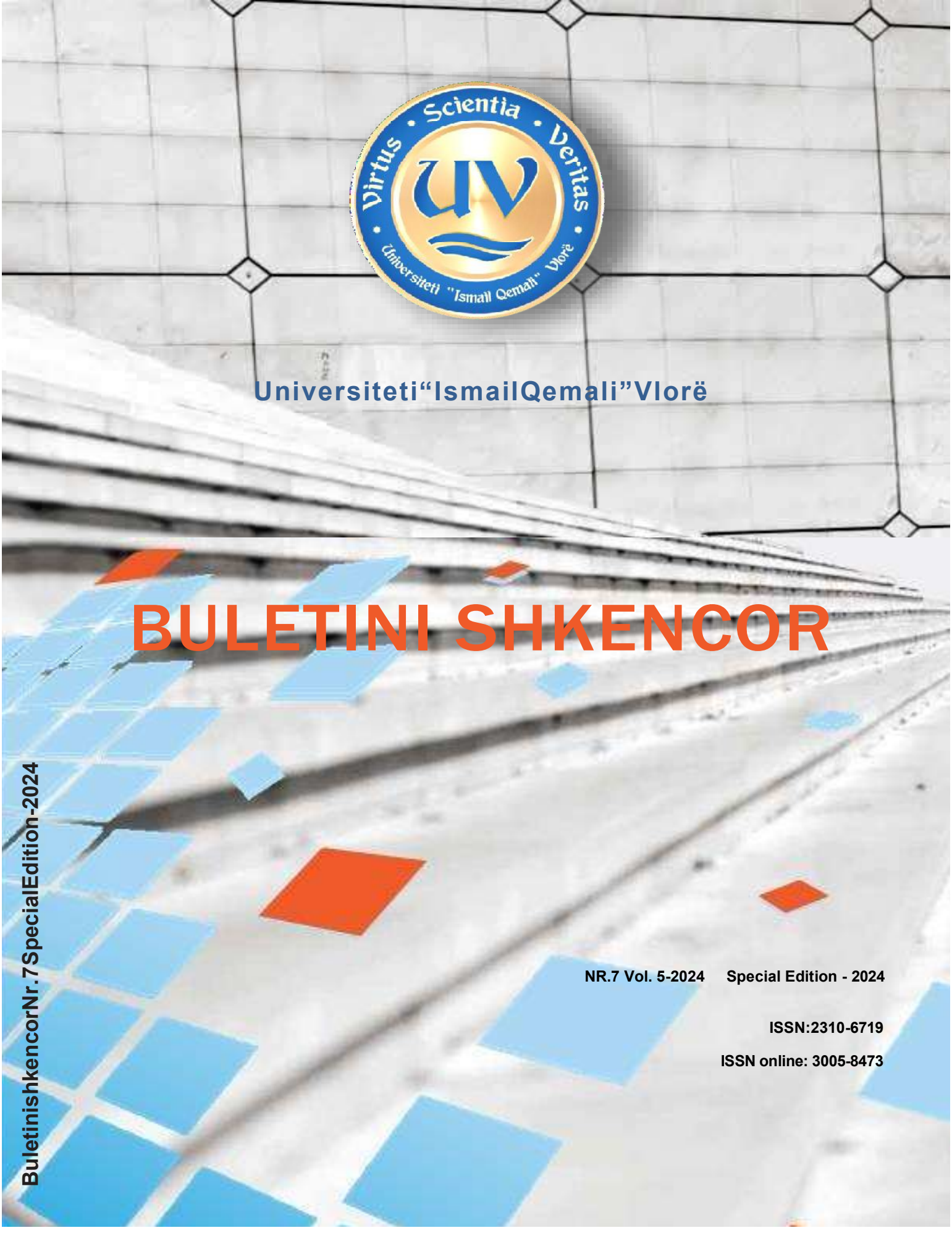

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About

On October 10, 2024, the University of Vlore hosted the international conference of the CRED4TEACH project, titled **"Building Competencies: Microcredentialing for Teacher Growth and Excellence."** The event took place at the "Ali Asllani" Conference Hall and was dedicated to promoting microcredentials as a vital tool for the professional development of teachers in Albania. Funded by the European Commission through the Erasmus+ Program, the conference emphasized the transformative potential of microcredentials in enhancing teaching competencies and aligning with the new qualification framework for teachers in the country.

The conference brought together a diverse group of participants, including academic representatives from partner universities of the CRED4TEACH project, microcredential experts, innovative teachers, and academic staff. Each contributor shared their work and insights on the role of microcredentials in advancing teacher professional development. The conference also served as a dissemination platform for the outcomes of the CRED4TEACH project and a forum for discussing strategies to support the implementation of the new teacher qualification framework.

The program was thoughtfully designed to include a mix of registration sessions, keynote addresses, and parallel presentations. It commenced with opening remarks and greetings from representatives of education authorities, followed by expert presentations on the importance of microcredentials in education. The event featured 15 presentations by academic experts, project partners, and teachers, focusing on practical applications of microcredentials and their implications for education in Albania. These sessions were structured into parallel tracks, allowing participants to present their findings in either Albanian or English within a 10-minute time frame.

In addition to fostering intellectual discussions, the conference emphasized the importance of participation as a professional milestone for teachers. Participants, regardless of whether they presented a paper, were awarded certificates of attendance. Moreover, all presented works were eligible for publication with an ISBN, providing an opportunity to further disseminate the knowledge and findings shared during the conference.

The significance of the conference extended beyond academic discourse, as it highlighted the importance of continuous professional development for teachers in enhancing their teaching portfolios. Representatives from key educational institutions, including the Ministry of Education and Sports, ASCAP, ZVA Vlore, and DAR Fier, participated in the event, reinforcing its relevance and impact.

The conference also showcased the potential of microcredentials to address the evolving demands of the education sector. By providing tailored and flexible learning opportunities, microcredentials empower teachers to acquire and validate specific skills, ultimately improving their effectiveness in the classroom. This aligns with the broader goals of the CRED4TEACH project to foster innovation and excellence in teaching through structured professional development.

In conclusion, the CRED4TEACH conference underscored the critical role of microcredentials in equipping teachers with the competencies needed to thrive in a rapidly changing educational landscape. By bringing together educators, researchers, and policymakers, the event not only celebrated the achievements of the CRED4TEACH project but also charted a path forward for integrating microcredentials into the professional development framework for teachers in Albania. This collaborative effort stands as a testament to the transformative power of education and the shared commitment to fostering excellence in teaching.

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Systematic Analysis of Research on MOOC-Based Micro-Credentials in Teacher Professional Development

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Abstract

The systematic analysis of MOOC-based micro-credentials in teacher professional development over the past decade represents a critical intersection of innovative educational practices and the evolving needs of educators. The PRISMA guidelines were used to identify the 47 peer-reviewed studies and then a thematic content analysis was employed to be able to identify benefits, challenges and common characteristics in best practices of MOOC-based micro-credentials in teacher professional development. The results indicate a significant correlation between participation in these programs and improved competencies among educators, although the direct impact on student outcomes remains an area of contention within the literature. The review further underscores the necessity for aligned support structures and collaborative learning environments to maximize the effectiveness of MOOCs in professional training contexts. Overall, the exploration of MOOC-based micro-credentials in teacher professional development not only emphasizes their potential to reshape educational practices but also reveals critical insights into the design and implementation of effective learning experiences. The increasing focus on micro-credentials reflects a broader shift towards recognizing and validating diverse learning pathways, crucial for adapting to the dynamic requirements of the modern educational landscape.

Introduction

Teacher professional development is widely recognized as a cornerstone of effective education systems, directly impacting teaching quality and student outcomes. Research highlights that ongoing professional development enables teachers to stay abreast of evolving pedagogical strategies, integrate emerging technologies, and adapt to diverse learner needs (Darling-Hammond et al., 2017). For instance, studies reveal that well-structured teacher professional development programs improve teacher confidence, instructional practices, and classroom engagement, fostering a more student-centered learning environment (Desimone & Garet, 2015). However, traditional teacher professional development models often fall short in addressing the complexities of modern education. Constraints such as limited resources, inflexible schedules, and geographical barriers hinder access for many educators, particularly those in underserved or remote areas (Avalos, 2011). These limitations underscore the need for innovative approaches to professional development that are not only scalable but also accessible and adaptive to individual teachers' contexts.

In response to these challenges, researchers have emphasized the potential of scalable and technology-enhanced training solutions. Digital platforms, such as MOOCs and micro-credentialing systems, offer personalized learning experiences that empower teachers to select content relevant to their professional goals. Scalability is achieved by leveraging online resources, reducing logistical constraints, and allowing educators to engage with materials at their convenience. Furthermore, personalized options supported by data-driven insights enable targeted interventions that address specific skill gaps (Kennedy, 2014). These advancements hold promise for creating more equitable access to high-quality teacher professional development, particularly for marginalized and geographically isolated teachers. Thus, there is a pressing need to reimagine teacher professional development through scalable, accessible, and personalized models, ensuring that every educator has the tools and support necessary to thrive in today's dynamic educational landscape.

Micro-credentials serve as a stackable certification of assessed learning, designed to validate specific skills and competencies. They are often recognized for their flexibility and focus on practical applications, making them particularly suited for educators looking to engage in lifelong learning (Foley et al., 2019). Research indicates that these credentials support professional development by providing accessible and fast-track options for obtaining recognized qualifications, thereby fostering a culture of continuous improvement among educators (Varadarajan et al., 2023). However, the literature on micro-credentials remains sparse, with many questions regarding their applicability, quality assurance, and integration into traditional educational frameworks (Hunt et al, 2019).

In recent years, Massive Open Online Courses (MOOCs) have emerged as a transformative force in education, especially in the context of professional development for teachers. Originally introduced in 2008, MOOCs provided unprecedented access to educational resources, allowing learners to enroll in a vast array of courses without incurring traditional tuition costs (Misra, 2018). As the landscape of higher education evolves, the integration of micro-credentials—shorter, modular learning experiences—has gained traction as a

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complementary approach to traditional degree programs. These micro-credentials are particularly appealing for professionals seeking to enhance their skills or transition to new career paths (Foley et al., 2019; Hunt, 2019).

The intersection of MOOCs and micro-credentials presents unique opportunities for teacher professional development. MOOCs, often categorized into xMOOCs and cMOOCs, offer different learning experiences—ranging from structured courses to collaborative, self-directed learning environments (Varadarajan et al., 2023). The advantages of MOOCs in teacher professional development include cost savings, improved accessibility, and the ability to develop essential teaching and digital skills (Sargent et al, 2023; Varadarajan et al., 2023). Moreover, studies have shown that participation in MOOCs can lead to improved educational outcomes, as teachers who engage in these programs often exhibit enhanced competencies and pedagogical practices. Despite these benefits, there are challenges associated with the implementation of MOOCs and micro-credentials in teacher professional development. Factors such as low completion rates and varying levels of student engagement necessitate a critical evaluation of MOOC effectiveness, and the methodologies used for assessing their impact (Verstelle & Shimshon, 2022). As educational institutions continue to explore innovative delivery methods, understanding the role of micro-credentials within the framework of MOOCs will be essential for advancing teacher professional development in a rapidly changing educational landscape.

Thus, the main goal of this study is to examine and synthesize research on the role of MOOCs-based micro-credentials in teacher professional development. More specifically the study was conducted to seek the answers to the following questions:

1. What are the potentials and challenges of utilizing MOOC-based micro-credentials in teacher professional development?
2. What are the common characteristics in best practices of adopting MOOC-based micro-credentials in teacher professional development?

Methodology

A systematic analysis based descriptive method was employed in this study. The choice of systematic analysis stems from its ability to provide an in-depth understanding of the 'how' and 'why' of the phenomena being studied, especially in contemporary contexts that require a nuanced understanding of bounded conditions and unique situational contexts (Zawacki-Richter, 2020). The research was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, which emphasize transparency and reproducibility in systematic reviews. Figure 1 provides a visualization of use of the PRISMA guidelines.

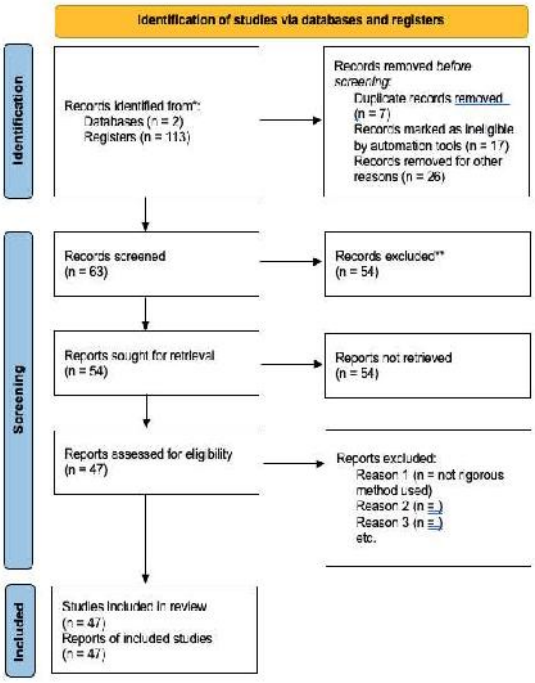

Fig. 1. PRISMA flow diagram used for article inclusion

In August 2024, a comprehensive search was performed in Web of Science and Scopus databases, focusing on articles published between January 1, 2014, and July 31, 2024. The initial search yielded 113 studies, which were screened for relevance according to predetermined inclusion and exclusion criteria, resulting in a final dataset of 47 articles suitable for analysis. The criteria for identifying the articles included articles (1) published in peer-reviewed journals, (2) in English, (3) available in full-text format. Main keyword phrases were included in the Boolean operator search: "micro-credential" or "microcredential", "MOOCs", "MOOC-based micro-credentials" and "teacher training", "in-service training" or "teacher professional development". Meanwhile those conference papers, non-peer reviewed studies and articles just related to pre-service teacher training were exploded from the list.

Findings

The reporting of the results was organized into two sections addressing the research questions.

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Benefits

This study highlights the effectiveness and benefits of MOOC-based micro-credentials in enhancing teacher professional development (TPD), particularly focusing on accessibility, personalized learning, and stackability.
MOOC-based micro-credentials significantly increase *accessibility* to professional development opportunities by transcending traditional geographic and logistical barriers. Teachers, especially those in underserved or remote regions, can access high-quality training materials and resources via internet-enabled platforms. Studies have shown that MOOC-based systems enable a diverse cohort of educators to engage in professional learning without requiring extensive travel or time away from work. This accessibility ensures equity in TPD, as educators with varying levels of institutional support or financial resources can benefit equally.
Another key advantage of MOOC-based micro-credentials is their capacity to provide *personalized learning experiences*. Advanced data analytics and adaptive learning technologies within MOOC platforms allow educators to tailor their learning journeys to specific needs and professional goals. For example, teachers can select modules aligned with their subject areas, skill gaps, or interests, thereby enhancing engagement and the relevance of the content. This personalized approach leads to higher satisfaction and better integration of acquired skills into teaching practices.
The *stackable nature* of micro-credentials offers teachers a flexible pathway to accumulate professional learning over time. Unlike traditional certifications that require upfront commitment to a full program, micro-credentials allow educators to earn recognition for incremental achievements. These credentials can often be combined to build towards larger qualifications, such as postgraduate certificates or degrees. This modularity empowers teachers to adapt their professional development efforts to their schedules and evolving career goals, making lifelong learning more feasible and sustainable.

Challenges

One significant issue with MOOC assessments is the *recognition* and *transferability* of the qualifications obtained. Despite participants being awarded certificates or badges for completing courses, these credentials are frequently not recognized by traditional educational institutions for admission or credit purposes (Varadarajan et al, 2023). This discrepancy underscores the lack of confidence in the *assessment quality* by MOOC providers themselves, leading to skepticism regarding the overall effectiveness of MOOCs in validating participants' learning achievements beyond basic comprehension. Moreover, the assessment frameworks used in MOOCs, particularly in cMOOCs (connectivist MOOCs), often prioritize peer assessment and immediate feedback rather than formal evaluations. While this approach can foster communication and collaboration among participants, it raises questions about the academic validity of the knowledge acquired, as the informal learning that occurs may not meet established academic standards.
In the realm of micro-credentials, establishing *reliable evaluation criteria* is crucial. Effective assessments must employ sensitive rating scales and ensure evaluators align their scores with established benchmarks to maintain consistency and accuracy. The rapid evaluation of submissions is essential, particularly for candidates who may need to revise and resubmit their work based on initial feedback (Chen, 2020). Maintaining continuity in evaluation is vital for minimizing candidate frustration and ensuring that feedback remains relevant and constructive. Nevertheless, measuring outcomes in professional development programs often relies on participant satisfaction as a key indicator of effectiveness, which does not necessarily correlate with actual improvements in teaching practices or student outcomes. This gap highlights the need for a more structured approach to assessing the impact of professional learning initiatives, as development is a complex, multifaceted process requiring rigorous evaluation methods (Duchaine, 2019).

Characteristics of Best Practices

Blended learning, modular design, and peer support and collaboration were identified as the common characteristics of the current best practices related to the MOOC-based micro-credentials for teacher professional development.
Blended learning refers to a learning model in which learners mainly participate in online activities and come together for only required face-to-face learning activities. Face-to-face sessions are often conducted as hybrid mode so that those who are not able to come to in-person meetings can access the activities remotely. Teachers can access theoretical content online through MOOCs at their own pace while engaging in practical, interactive sessions in their local contexts. This dual approach enhances knowledge transfer and application by allowing educators to contextualize online learning within real-world teaching environments. Additionally, the blended model supports continuous professional development without disrupting teaching schedules, thereby maximizing participation and engagement.
The *modular design* is also a common characteristic in the best practices of the MOOC-based micro-credentials.

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It allows professional development content to be delivered in smaller, manageable units. This design empowers teachers to focus on specific competencies or topics that are immediately relevant to their professional needs. Research suggests that breaking down content into smaller units reduces cognitive load, facilitates deeper understanding, and promotes incremental skill acquisition. Modularization also allows educators to assemble their learning paths progressively, aligning with their schedules and long-term career goals.

The study also showed that integrating *peer interaction* within MOOCs cultivates a collaborative learning environment where teachers can share experiences, exchange best practices, and provide mutual support. This collaborative approach not only enriches the learning experience but also helps in contextualizing theoretical knowledge into practical classroom applications. For instance, a study on a MOOC designed to support Greek-language secondary education teachers in implementing collaborative writing activities with Google Docs found that peer interaction and mutual support were crucial in promoting active engagement and the development of learning design abilities (Koukis & Jimoyiannis, 2019). MOOC-based platforms offer rich opportunities for peer support and collaboration, crucial for teacher professional growth. Discussion forums, group projects, and peer assessments embedded within these MOOCs create virtual professional learning communities where teachers can exchange ideas, share best practices, and offer constructive feedback. Such interactions foster a sense of belonging and motivate participants to engage more actively. Peer support also enhances learning outcomes by encouraging collaborative problem-solving and mutual accountability.

Conclusion

The systematic analysis of MOOC-based micro-credentials highlights their transformative potential for teacher professional development. Integrating MOOCs and micro-credentials into pre-service and in-service teacher training is not only necessary but also highly beneficial. These models offer scalable, flexible, and accessible pathways for teachers to acquire and demonstrate specific competencies aligned with their professional needs. By facilitating personalized, modular learning experiences, MOOCs and micro-credentials address the diverse requirements of educators and enable continuous skill development in a rapidly evolving educational landscape. Incorporating these innovative approaches into teacher training programs can strengthen the overall quality and relevance of professional development.

However, realizing the full potential of MOOC-based micro-credentials requires strategic partnerships among various stakeholders, including educational institutions, governmental bodies, and private organizations. Collaboration is essential to establish standardized frameworks for the recognition and validation of micro-credentials, ensuring their credibility and portability across different contexts. Furthermore, incentivizing teacher participation through financial support, career advancement opportunities, and professional recognition is critical to fostering widespread adoption and sustained engagement. By addressing these key factors, stakeholders can create a robust ecosystem that leverages the advantages of MOOCs and micro-credentials, ultimately enhancing the teaching profession and improving educational outcomes globally.

This systematic analysis of MOOC-based micro-credentials in teacher professional development also underscores the need for further research to advance both theoretical understanding and practical implementation. Based on the findings;

- Future research should focus on longitudinal studies to evaluate the sustained impact of micro-credentials on teachers' skill acquisition, classroom practices, and student outcomes. While existing studies provide insights into short-term benefits, a deeper understanding of how micro-credentials influence long-term professional growth and educational effectiveness is critical. Such studies should also investigate how micro-credentials integrate into broader professional development and training programs, examining their scalability, adaptability, and alignment with institutional and systemic goals.
- To enhance the effectiveness of MOOCs for teacher professional development, research should explore innovative design approaches. The integration of artificial intelligence (AI) for personalized learning pathways, adaptive learning technologies to cater to diverse needs, and gamification elements to foster engagement and motivation are particularly promising. Additionally, the development of MOOCs that emphasize experiential learning and collaborative activities could improve both the quality and relevance of the professional development experience. Research should assess the impact of these design innovations on teachers' learning outcomes and engagement levels.
- Another critical area for investigation is the establishment of international recognition standards for MOOC-based micro-credentials. As these credentials gain traction in professional development, research should focus on identifying frameworks that ensure their validity, credibility,

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and portability across different educational systems and geographic regions. Collaboration among policymakers, accreditation bodies, and educational institutions is necessary to develop globally accepted standards that enhance the utility of micro-credentials in the teaching profession.

By addressing these research priorities, the academic community can contribute to the refinement of MOOC-based micro-credentials and their integration into teacher professional development. This will not only improve the quality and accessibility of professional learning but also support the development of globally competent and adaptive educators.

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An AI based tool designed and developed as an on-going research project by Stanford University, entitled as STORM. It is an AI tool designed by computer scientists to generate Wikipedia-like entries within minutes. STORM stands for Synthesis of Topic Outlines through Retrieval and Multi-Perspective Question Asking. More information can be found at https://storm.genie.stanford.edu/

The main rationale behind the usage of this AI tool was to test the tool, generate a quick review based on actual studies and references, and use better English to express the ideas.

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Rethinking the training ofin-service teachers in Portugal through Micro-credentials

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Extended Abstract

This short paper introduces an innovative programme for the training of in-service teachers through micro-credentials (MCs). This programme offers an alternative solution to the traditional training of teachers by combining scalability, pedagogical innovation and a more flexible and accessible approach to teachers' upskilling, aligned with national strategies and European goals (Caetano, Casanova & Moreira, 2023).

The professional development of in-service teachers addresses significant challenges within the Portuguese education system, such as an ageing workforce, declining teacher recruitment, and the urgent need for continuous professional learning. By 2030, approximately 50,000 teachers are expected to leave the profession, exacerbating existing teacher shortages (EU, 2023). This situation highlights the critical need to upskill current teachers, particularly those who lack formal teaching qualifications. Currently, Universidade Aberta (UAb) offers the "Curso de Profissionalização em Serviço" (CPS), a traditional programme specifically designed for in-service teachers with six or more years of teaching experience, which has been in place since 2018.However, this programme requires updating to better meet the needs of teachers and address the evolving demands of the contemporary educational landscape in Portugal.

The new MCprogrammecan adopt a modular, micro-credential framework, enabling the same target group of teachers to progressively develop and certify their pedagogical competences. Spanning two or three semesters and providing 60 ECTS credits, the programme is delivered via asynchronous distance education, utilising platforms such as Moodle (focus on learning) and Wiseflow (focus on assessment). The training programme incorporates a diverse range of learning activities based on Laurillard's six learning types: acquisition, inquiry, practice, production, discussion, and collaboration (Laurillard, 2013). This diversity ensures meaningful and impactful learning experiences, emphasising practical application and collaborative learning to enable immediate classroom implementation.

The MC programmeshould be designed to prioritise critical areas such as technology in education, digital competences,artificial intelligence, curriculum development, supervision, school leadership, and pedagogy. The proposed programmeis aligned with national priorities for modernising education and offers participants the flexibility to tailor their learning pathways while balancing professional responsibilities. While many MCs can be adapted from existing approved curricula, others can be bespoke, designed to address specific teacher's needs. The ultimate objective is to achieve the formal recognition by the Ministry of Education, positioning this programme as a replacement for the current CPS.

Over the past five years, UAb has certified more than 20,000 students in lifelong learning programmes, with 3,000 certifications issued specifically for micro-credentials. This extensive expertise in delivering micro-credential programmes underpins the institution's capability to ensure the success of this initiative.

In summary, the MC programme for in-service teachers training, unlike traditional courses that often cover broad subject areas, is designed to address specific, actionable skills that teachers can immediately apply in their practice. For example, a teacher might pursue a micro-credential in using artificial intelligence to personalise learning experiences. This targeted approach ensures that professional development is aligned with the practical challenges and opportunities teachers encounter in their practice.

Furthermore, the MC programmeincludes evidence-based assessment activities, requiring participants to demonstrate mastery of the skills they have acquired and/or developed. This provides a tangible and credible way for teachers to showcase their competences. As education continues to evolve, the demand for lifelong learning and skill adaptation is becoming increasingly critical. Micro-credentials represent a modern and effective solution for in-service teachers, equipping them with the tools they need to enhance their practice and respond to the changing demands of their profession (Scott et al., 2024).

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Gaps in the Quality Assurance of Micro-Credentials

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Abstract
Micro-credentials (MC) have emerged as a flexible, personalised approach to skills development, offering opportunities for learners to upskill or reskill in a more focused and accessible manner, while enabling employers to address specific skills gaps efficiently. Despite their rising potential to transform education and workforce development, significant questions surrounding quality assurance persist. Issues related to the standardisation, transparency, and transferability of MC pose challenges for both learners and employers seeking to validate and recognise them across different contexts. This paper examines the critical gaps in the quality assurance of MC. Through an analysis of existing literature, this study highlights the pressing need for robust frameworks and alignment mechanisms that guarantee the quality and value of MC. Furthermore, it highlights the importance of collaboration between educational institutions, industry partners, and policymakers in building a sustainable infrastructure that ensures the integrity and portability of MC within the broader educational and employment landscape.

Introduction

The rise of micro-credentials represents a major shift in global education, offering a flexible, affordable alternative to traditional degrees. They allow learners to quickly gain specific skills for the evolving job market. Micro-credentials are known by various names, such as nanodegrees, micromasters, and alternative credentials, with diverse definitions ranging from academic certificates to digital badges, reflecting their wide range of formats and purposes (Van der Hijden & Martin, 2023; Virkus, 2019).
Brown et al. (2021) note that "micro-credentials" first appeared in Google searches in 2013. They are small, certified learning achievements that verify a learner's skills or knowledge, gained through study, work, or life experience. Awarded after short courses or recognition of prior learning (Van der Hijden & Martin, 2023), micro-credentials address societal, personal, or labor market needs. Owned by the learner, they are shareable, transferable, and can stand alone or complement other credentials, backed by QA standards (EC, 2022; UNESCO, 2022).
Cote and White (2020, p. 8) identify challenges within traditional education that MC have the potential to address: 1) the long duration of study programs; 2) the relative inflexibility of programs; 3) inadequate recognition of prior learning; 4) slow or limited innovation in pedagogy; 5) insufficient student supports for career-readiness; 6) weak alignments to labour market needs; and 7) limited commitment to online and digital-enabled learning.
Micro-credentials offer flexible, short-term learning options, often online, allowing individuals to reskill or upskill for specific career goals. They can certify prior learning and adapt to diverse backgrounds, focusing on industry-relevant skills. Delivery modes vary, with an emphasis on digital badging (Steel et al., 2022). In Europe, MCs primarily aim to enhance labor market competitiveness (Lantero et al., 2021), while in Canada, 74% of providers prioritize access to further education (Duklas, 2020). MCs are widely used by universities, online platforms, and industry to meet evolving workforce skill needs (Brown et al., 2021). However, their rapid growth has raised concerns about QA standards, which are key to ensuring credibility and value (Brown & Duart, 2024).

Gaps in the Quality Assurance of Micro-Credentials

Traditional higher education follows strict QA standards overseen by accrediting bodies. However, MC, being short-term and skills-focused, often lacks such oversight, creating gaps in consistency and recognition. Research has identified several challenges in the QA of MC (Ahsan et al., 2023; Brown & Duart, 2024; Van der Hijden & Martin, 2023; Varadarajan et al., 2023; Wheelahan & Moodie, 2024). These can be grouped as follows:

1. Regulatory and framework gaps:
   - Absence of standardized frameworks and evaluation mechanisms.
   - Fragmented or insufficient regulatory frameworks.
   - Lack of comprehensive national legislation.
2. Quality Assurance mechanisms:
   - Inconsistent or immature QA practices across sectors.
   - Inadequate or insufficient QA mechanisms.
   - Limited engagement or response from QA agencies.
   - Significant variation in assessment and validation methods.
3. Integration with existing systems:
   - Challenges in integrating MC with existing education and training systems.

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- Difficulties ensuring long-term recognition and portability across industries and educational institutions.
- Underdeveloped multi-actor ecosystem supporting micro-credentialing.

4. Stakeholder engagement and alignment:
   - Inadequate engagement with key stakeholders.
   - Inconsistent alignment with industry standards and expectations.
   - Gaps in public accountability and transparency.
5. Conceptual and research gaps:
   - Lack of common definitions and terminology.
   - Limited research on the effectiveness and impact of MC.

Many institutions lack clear regulations for developing and assessing MC, affecting their credibility (Ahsan et al., 2023; Brown & Duart, 2024). A key issue is the absence of national legislation defining MC and QA standards (Brown & Duart, 2024). With wide variation in structure, length, and assessment methods (Selvaratnam & Sankey, 2021), it is challenging to establish a unified standard. This variability creates inconsistencies in quality and recognition, complicating effective QA processes (Ahsan et al., 2023).

Existing QA mechanisms may not be adequately adapted to address the unique characteristics of MC, resulting in challenges to ensuring their quality and reliability (Ahsan et al., 2023). In many OECD jurisdictions, external QA agencies have not specifically addressed MC-related QA considerations. While some countries have adopted common QA frameworks, many still lack specific standards or requirements for MC (Brown & Duart, 2024). A significant gap also exists in the recognition and portability of MC across educational institutions and industries (Van der Hijden & Martin, 2023).

QA protocols for MC often lack transparency, with unclear documentation of competencies, outcomes, and assessments. This inconsistency fuels skepticism among employers and institutions, limiting their reliability (Ahsan et al., 2023). Unlike traditional programs with rigorous assessments, MC often uses less intensive methods. A survey of over 500 US employers found that while MC are valued, assessing their quality remains a challenge (Brown & Duart, 2024).

The lack of rigorous assessment and QA for MC raises doubts about the validity of the skills claimed, reducing trust in both academic and employment sectors (Ahsan et al., 2023). This weakens their credibility, leaving institutions with inconsistent practices. As a result, learners and employers often question the quality of these credentials (Brown & Duart, 2024). Brown and Duart (2024) stress the importance of integrating MC into existing QA systems to avoid added administrative burdens.

Although MC are intended to meet specific industry needs, current QA frameworks often lack mechanisms to ensure continuous alignment with evolving industry requirements. This gap can lead to MC becoming outdated, reducing their practical value for both employers and learners. Moreover, the involvement of key stakeholders - such as employers and industry representatives - in the design and assessment of MC is often insufficient, leading to a disconnect between educational offerings and labor market demands (Ahsan et al., 2023). To ensure MC remain relevant to both labor market needs and educational standards, there is a growing need for greater involvement from various stakeholders, including learners, employers, and industry partners, in the QA process (Brown & Duart, 2024).

The absence of a universally accepted global definition for MC complicates the development of consistent QA standards and practices. This lack of clarity contributes to disparities in the perception and evaluation of MC (Brown & Duart, 2024; Zhang & West, 2020). Further empirical research is necessary to assess the effectiveness of MC in achieving desired learning outcomes and to understand their impact on employability and career progression (Ahsan et al., 2023).

These gaps underscore the urgent need for further research and the development of rigorous QA frameworks and practices to strengthen the credibility and effectiveness of MC within the educational landscape (Ahsan et al., 2023; Brown & Duart, 2024). Failure to address these challenges may result in MC falling short of providing learners with meaningful, recognised pathways for personal and professional development, ultimately limiting their impact on employability and career advancement.

Current Efforts in Quality Assurance of Micro-credentials

QA is a key barrier to the wider adoption of MC (Brown & Duart, 2024). Recent initiatives by policymakers, regulatory bodies, and education providers at various levels have sought to address this. For example, the European Commission developed a refined MC definition and roadmap through consultations (EC, 2020; Orr et al., 2020), while the Microbol project explored MC integration in the European Higher Education Area (Lantero et al., 2021). The European MOOC Consortium also created an MC framework, emphasising internal QA processes of higher education institutions (EMC, 2019).

A growing number of HEIs, including those in the Erasmus+ European Universities initiative, are working on defining and implementing MC. The European Consortium of Innovative Universities (ECIU) has

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focused on MC, aligning its approach to QA with the European Commission and the Microbol project. Projects like the Erasmus+ co-funded "Stacking Credits and the Future of the Qualification" (STACQ), led by Nuffic, have supported institutions in evaluating and recognising MC. STACQ developed an online tool assessing criteria such as QA, verification, level, learning outcomes, workload, testing, and identification (ENQA, 2023). These initiatives aim to standardise competencies, assessment criteria, and documentation requirements for MC, yet widespread adoption remains a challenge due to varying local requirements and regulatory environments (EMC, 2019; ENQA, 2023; EC, 2020; UNESCO, 2022).

The research identifies several countries that exemplify best practices in the QA of MC (e.g. Australia, Canada, the Netherlands, Spain, the United Kingdom, Malaysia). These countries have made intentional decisions to adopt common standards and frameworks for the QA of MC (Brown & Duart, 2024). The study by Brown and Duart (2024) outlines several key lessons learned regarding the QA of MC: 1) Importance of clear definitions; 2) Need for robust QA frameworks; 3) Integration with existing QA systems; 4) Stakeholder engagement; 5) Continuous improvement and monitoring; 6) Addressing gaps in information; and 7) Collaboration among QA agencies. These lessons underscore the need for a coordinated approach to QA in the context of MC, which is essential for their successful integration into the educational landscape.

Conclusions

While MCs present significant opportunities for flexible, targeted learning and lifelong skill development, their full potential is hindered by considerable QA challenges. The absence of standardised QA frameworks, inconsistencies in recognition and assessment, and a lack of transparency are key obstacles that must be addressed to enhance their credibility and value. Coordinated efforts at national, regional, and global levels are essential to develop unified standards, foster transparency, and ensure greater stakeholder engagement. Educational institutions, employers, and accrediting bodies must collaborate to create scalable, rigorous QA processes that support the credibility and long-term recognition of MC. Only through these concerted actions can MC realise their potential as a meaningful and integral part of modern educational and professional pathways, providing learners with reliable and recognized tools for career advancement and personal growth.

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Global Micro-credentials trends and best practices in education

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Abstract. Nowadays knowledge quickly becomes outdated, and traditional higher education does not guarantee high qualifications throughout life. It is necessary to retrain and update your knowledge constantly. It is most convenient to do this annually in the form of short courses lasting several credits. Students trust that an industry micro-credential will help them secure a job. Educational technology is constantly evolving. Tools that were recently considered state-of-the-art, like SMART Boards or essential LMS platforms, are being overtaken by more advanced technologies such as AI-driven adaptive learning platforms, virtual reality classrooms, and interactive mobile apps. Educators and students must continuously update their knowledge and skills to use these new tools effectively. Teaching standards and certification requirements are continually updated to reflect new educational priorities and research. Educators who do not engage in professional development may find themselves out of touch with current best practices, academic standards, or technological advancements. Micro-credentials are the most affordable way for many professionals to keep their skills current and in demand by employers.

Keywords*: micro-credentials, short course, skill, qualification, professional certificate.*

Introduction

In today's rapidly evolving world, knowledge is quickly becoming outdated, and traditional higher education alone can no longer guarantee lifelong qualifications. The workforce now demands continuous learning and skill updates to stay competitive. Micro-credentials, which are short, focused qualifications aimed at specific skills, have emerged as an effective solution to this problem. These credentials, offered by universities, online platforms, and professional organizations, allow learners to stay current in their fields and meet the demands of rapidly changing industries. This paper will explore the global trends, best practices, and future prospects of micro-credentials in education.

The Growing Need for Micro-credentials

One of the critical reasons for the rise of micro-credentials is the increasingly short lifespan of knowledge. As industries evolve due to technological advancements, the skills taught even a few years ago can quickly become obsolete (OECD skills outlook 2021: Learning for life, 2021). For instance, programming languages and tools used in computer science programs may become irrelevant within just a few years as new technologies emerge. Similarly, fields such as data science and artificial intelligence are advancing at a breakneck pace, and professionals must constantly update their knowledge to remain relevant. Traditional degrees, which may take several years to complete, need to catch up with the rapid pace of change. As a result, micro-credentials offer a more flexible and timely way to acquire new skills.
The COVID-19 pandemic further accelerated the demand for micro-credentials, particularly in education. As educators were forced to adapt to online and remote learning environments, the need for new skills in technology and pedagogical approaches became critical. Traditional lecture-based instruction was quickly supplemented or replaced by interactive and student-centered methods, such as blended and project-based learning. This shift highlighted the importance of continuous professional development for educators, many of whom turned to micro-credentials to acquire the necessary skills.

Global Trends in Micro-credentials

Although the term micro-accreditation became popular only in 2016 (seeFig. 1), the rise of micro-credentials is a global phenomenon, with institutions around the world adopting this flexible form of education. According to a 2024 report by Coursera (Micro-Credentials Impact Report, 2024), 51% of global education institutions offer micro-credentials. North America is leading the charge, with many universities and professional organizations providing a wide range of industry-recognized micro-credentials, particularly in the

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fields of IT, healthcare, and business. Europe has also seen significant growth, partly driven by the European Commission's initiatives to promote lifelong learning and upskilling. Meanwhile, countries in the Asia-Pacific region, such as Australia and India, are embracing micro-credentials to address skills shortages in technology and engineering fields.

Micro-credentials' popularity is also reflected in the rise of online learning platforms. Massive Open Online Course (MOOC) providers like Coursera, edX, and FutureLearn have significantly expanded their micro-credential offerings. These platforms offer various industry-aligned courses, allowing learners to acquire skills in a flexible, accessible format. For instance, Coursera reported a 73% year-over-year increase in enrollments for professional certificates and microcredentials in 2020, demonstrating the growing demand for these qualifications.

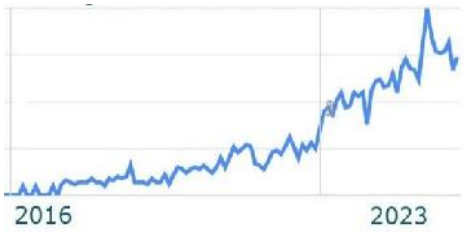

Fig. 1. Google trends for "micro-credentials".

Data from Coursera's Report(Advancing Higher Education with Industry Micro-Credentials, 2024) revealed that learners without traditional degrees took the same time to acquire critical skills as their degree-holding counterparts. This finding highlights the growing acceptance of micro-credentials as a valid form of professional development, even for those without formal higher education qualifications.

Best Practices in Micro-credential Programs

For micro-credentials to be effective, they must be aligned with industry needs and designed with flexibility and accessibility. One of the essential best practices is to collaborate with industry experts and employers when designing micro-credential courses. This ensures that the skills taught are relevant and valued by employers, increasing the employability of learners. Additionally, micro-credential programs should be designed to accommodate different learning styles and preferences. For example, courses can be delivered through multiple modes, including visual aids for visual learners, podcasts and recorded lectures for auditory learners, and hands-on projects for kinesthetic learners.

Another critical aspect of successful micro-credential programs is flexibility. Modular course design, where courses are broken into smaller, self-contained modules, allows learners to progress at their own pace and fit learning into their busy schedules. Self-paced learning and competency-based education are also essential features, as they enable learners to focus on mastering specific skills rather than spending a fixed amount of time on a course. This is particularly important for working professionals who must balance education with job responsibilities.

Furthermore, micro-credentials should incorporate modern assessment methods that go beyond traditional exams and written assignments. Newer approaches, such as gamified assessments, real-time feedback, and practical projects, can provide a more accurate measure of a learner's skills and knowledge. Digital badges, which can be easily shared on professional networks like LinkedIn, provide a verifiable way for learners to demonstrate their competencies to potential employers.

Technology plays a critical role in the development and delivery of micro-credential programs. Online learning platforms, virtual classrooms, and AI-driven adaptive learning technologies are making education more accessible and personalized than ever before. For example, virtual learning environments (VLEs) allow learners to engage with course materials from anywhere in the world, while AI can be used to tailor learning experiences based on individual progress and preferences.

Moreover, technology enables new assessment forms beyond traditional exams and essays. Gamified assessments, real-time feedback, and practical projects provide more accurate measurements of a learner's skills and knowledge. Digital badges, which can be easily shared on professional networks like LinkedIn, provide verifiable proof of a learner's accomplishments and can enhance their employability.

The Future of Micro-credentials

As micro-credentials continue to grow in popularity, they are likely to become even more integrated into traditional education systems (Advancing Higher Education with Industry Micro-Credentials, 2024). In some cases, micro-

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credentials may be an alternative to complete degrees, especially in industries where practical, up-to-date skills are prioritized over formal qualifications. For example, in IT and digital marketing fields, employers often value demonstrated skills and certifications more than a traditional degree. As a result, micro-credentials could offer a more accessible and efficient path to career advancement for many learners.

A survey conducted at the Ukrainian Engineering-Pedagogics Academy has shown that almost half of 1st - 2nd-year students of IT specialties expect that college education will become unpopular and will be replaced by short-term courses throughout their lives(see Fig. 2).

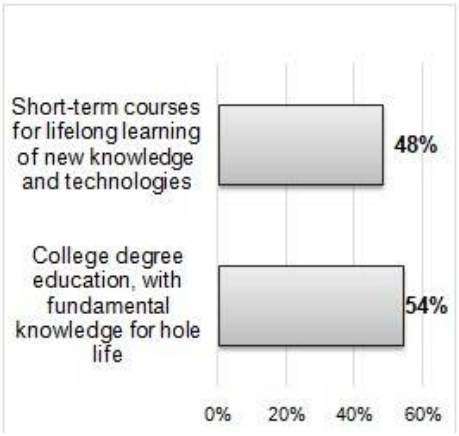

Fig. 2. Results of the survey of IT students "What type of education will prevail in the future?"

Moreover, micro-credentials offer the potential for personalized, lifelong learning paths. Learners can choose from a wide range of courses and programs to build their own customized learning journey, acquiring new skills as they progress through their careers. This could be particularly valuable in a rapidly changing job market, where workers must continuously update their skills to stay competitive. The concept of "subscription-based education," where learners return to their alma mater or other institutions for ongoing education throughout their careers, is one potential model for the future. This approach would enable professionals to upskill regularly, ensuring that they remain adaptable in evolving industries.

Conclusion

Micro-credentials are increasingly important in education and professional development, offering a flexible and accessible way to acquire new skills in a rapidly changing world. As industries evolve and traditional knowledge becomes outdated, micro-credentials provide learners with the tools they need to stay competitive and advance their careers. By aligning with industry needs, offering flexible learning options, and incorporating modern assessment methods, micro-credentials will likely become a key component of lifelong learning.

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Teachers' Readiness for Learning via MOOCs During War-time: Ukrainian Case

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Abstract

This article explores the topical issue of Ukrainian teachers' readiness to obtain micro-credentials during wartime. Rapid changes in the education system, such as the swift digitalization of the educational process, the implementation of inclusive education, and the emergence of a new position of a teacher's assistant, along with the need for psychological support during wartime, demand continuous professional development from teachers. As part of the Erasmus+ K2 project "MOOC-based micro-credentials for teacher professional development" (CRED4TEACH), a national framework for recognizing micro-credentials in Ukraine is being developed, as well as institutional framework to ensure the quality of micro-credentials and their focus on regional educational needs. The project aims to provide high-quality, timely, inclusive, flexible, and competency-based learning for teachers. Therefore, as part of the development of institutional framework at Drohobych Ivan State Pedagogical University (DSPU), a survey of regional teachers was conducted to assess their perceived needs for obtaining micro-credentials. The purpose of this article is to analyze the readiness of Ukrainian teachers to obtain micro-credentials during wartime and to identify the factors influencing this process. The novelty of the research lies in filling the gap in scientific knowledge about teachers' readiness to obtain micro-credentials in the face of challenges. Based on a survey of 280 teachers in Lviv Oblast, the study analyzes the levels of teachers' readiness for self-education and their desire to obtain micro-credentials. Respondents chose the forms, methods, and terms of study for obtaining micro-credentials and evaluated their own level of motivation and readiness to obtain micro-credentials. The obtained results are a valuable contribution to understanding the needs of teachers and developing strategies for their professional development in challenging conditions. This article will be useful for educational program developers, school directors, and teachers seeking to improve their qualifications.

Keywords: micro-*credentials, teacher, self-education, professional development, war, Ukraine.*

Introduction

Micro-credentials, a relatively new concept in higher education, have emerged as a promising solution to address the evolving needs of learners and employers. These bite-sized credentials, often focused on specific skills or knowledge areas, offer a flexible and accessible pathway to professional development. The growing popularity of micro-credentials can be attributed to several factors:

Alignment with Contemporary Challenges (Oliver, 2019): Micro-credentials effectively respond to the rapidly changing labor market, where skills obsolescence is a growing concern. By providing learners with the opportunity to acquire specific skills on demand, micro-credentials help individuals stay relevant and competitive in their careers.

Enhanced Accessibility and Flexibility (Brown et al., 2021): Micro-credentials often involve online delivery formats, making them accessible to a wider range of learners, including those with limited time or geographic constraints. Additionally, the modular nature of micro-credentials allows learners to customize their education based on their individual needs and career goals.

Industry Support and Investment (Ashan, 2023; Williams, 2024): The potential of micro-credentials has not gone unnoticed by industry leaders, universities, and governments. Significant

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investments are being made to develop and promote micro-credential programs, further driving their growth and adoption.

Despite their many advantages, micro-credentials are not without their challenges. Standardization and regulation are essential to ensure the quality and credibility of micro-credential offerings. Moreover, while micro-credentials can complement traditional educational programs, they cannot fully replace comprehensive degree programs. Developing appropriate regulatory and institutional mechanisms is crucial to support the integration of micro-credentials into the broader higher education landscape (Ratnasari, Chou & Huang, 2024).

Micro-credentials represent a significant advancement in higher education, offering a flexible, accessible, and skills-focused approach to learning. As the demand for micro-credentials continues to grow, it is imperative to address the challenges associated with their implementation and ensure that they contribute to the overall improvement of educational services and outcomes. A highly effective method for enhancing teacher professional development is by leveraging Massive Open Online Courses (MOOCs), which offer a scalable platform for accessing quality learning opportunities.(Boltz et al., 2021).

Ukrainian legislation clearly defines professional development as an integral component of teachers' career growth. This process involves not only acquiring new knowledge and skills but also the continuous improvement of existing competencies. This analysis focuses on the key provisions of the Law of Ukraine "On Education" (2017) regarding teacher professional development. The Law clearly distinguishes between "retraining" and "professional development". Retraining is aimed at acquiring a new profession, while professional development involves improving existing competencies within the already acquired profession. Both processes are integral parts of postgraduate education and are aimed at ensuring a high level of professionalism among teachers.

The Law guarantees teachers the right to professional development and retraining. Moreover, they have the right to freely choose the forms, programs, and educational institutions for their professional development. Importantly, the state guarantees the financing of teacher professional development. Educational institutions play a crucial role in ensuring teachers' professional development. They are obliged to create conditions for teachers' self-education, promote their participation in professional development programs, and support any other forms of professional growth.

An analysis of legislative norms indicates that teacher professional development in Ukraine is a priority of state policy in the field of education. The legislation creates the necessary conditions for ensuring the continuous professional development of teachers, guaranteeing their rights and obligations, and defining the role of educational institutions in this process. Types of Professional Development: training programs (this includes participation in seminars, workshops, trainings (seminar-workshops, seminar-conferences, seminar-trainings), webinars, masterclasses, and so on) and internships.

According to the current legislation, professional development can be carried out in various forms, including participation in academic mobility programs, research internships, self-education, obtaining a scientific degree, and higher education. In accordance with the Decree of the Cabinet of Ministers of Ukraine "On Certain Issues of Advanced Training of Pedagogical and Scientifi and Pedagogical Staff" (2019), pedagogical staff have the right to independently choose the forms, types, directions, and subjects of professional development. This indicates the decentralization of the professional development process and its focus on the individual needs of teachers. The Law of Ukraine "On Complete General Secondary Education" (2020) establishes the mandatory annual professional development for all pedagogical staff and guarantees reimbursement of expenses related to business trips for professional development. At the same time, each teacher has the right to choose any educational institution or other educational entity to improve their qualifications. The issue of the duration of professional development for pedagogical staff in Ukraine is regulated in detail by the current legislation, in particular by the Law of Ukraine "On Complete General Secondary Education" (2020) and the subordinate acts that supplement it.

According to the current legislation, the total duration of professional development for pedagogical staff is determined on an accumulative basis and is expressed both in hours and in ECTS credits. At the same time, different minimum standards are established for different categories of pedagogical staff: pedagogical staff of general secondary education (at least 150 academic hours over five years); pedagogical staff of preschool, out-of-school, and vocational secondary education (at least 120 academic hours over five years);

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pedagogical staff of higher and postgraduate education: at least 6 ECTS credits over 5 years.

One ECTS credit is equivalent to approximately 30 hours of total workload, including classroom activities, independent work, and preparation for exams. An important feature of modern educational programs is the integration of knowledge and practical skills. In particular, it is assumed that at least 10% of the study time will be devoted to the development and implementation of inclusive approaches in the educational process. In addition, teachers must have the skills to provide psychological support to students, which involves allocating at least 10% of the study time to the development of the corresponding competencies.

Research Question: How are Ukrainian teachers prepared to actively obtain new knowledge and skills through micro-credentials, particularly in the challenging context of wartime?

Method: A voluntary online survey was administered to secondary school teachers in the Lviv region, Ukraine, from August 10 to September 10, 2024. Invitations were sent to school directors, who then disseminated the survey among their staff. A total of 280 female teachers from 120 schools participated, representing a 9.9% response rate at the school level.

Participants: The sample consisted of 280 female teachers with an average age of 46 years (range: 25-60) and an average teaching experience of 23 years (range: 2-35). The sample was balanced in terms of geographic location, representing both urban and rural schools.

Findings

Ukrainian legislation and education laws stipulate that teachers must continuously engage in professional development. Research findings indicate that 74.3% of surveyed teachers are interested in obtaining micro-credentials. Among the factors influencing teachers' choice of micro-credentials, the following can be highlighted: labor market relevance (52.8%), the possibility of distance learning (44.4%), duration of study (22.2%), and the prestige of the institution (19.4%).

The next significant factor in the choice was the format of learning. The vast majority of teachers selected an online course (MOOC) – 75% (fig.1).

One of the defining criteria for motivation and readiness for self-education was the duration of the course, as MOOCs typically involve 4-6 ECTS (120-180 hours). 72.2% of surveyed teachers plan to obtain a micro-credential after short-term training.

In Ukrainian society, there is an active discussion about the digital skills of teachers, especially those in rural schools. Survey results show that 72.2% of teachers consider their digital skills sufficient to undergo training based on MOOC technologies. An important feature of MOOC-based online courses is the lack of constant pedagogical support; participants communicate on forums and form unique online educational communities. The majority of teachers surveyed, 63.9%, indicated that they do not have enough information about MOOCs to decide whether they need pedagogical support. However, 30.6% of respondents believe that they do not need pedagogical support and that MOOC learning is the best choice, as it has a flexible schedule and an individual pace of learning.

Regarding the forms and methods of presenting material in MOOCs for obtaining micro-credentials, teachers' opinions were divided.

The learning process, its intensity, duration, and independence from others are the key advantages of MOOC technologies. Most respondents (33.3%) indicated that they can obtain MOOCs both individually and as a team, and will adapt to the conditions of MOOCs. This confirms the thesis of the constant adaptation of teachers to new educational realities. Given the workload of modern teachers, the war, shelling, and problems with electricity, mobile communication, and the Internet, an important criterion for developing MOOC tasks and materials was determining the amount of time (hours per week) that teachers can devote to MOOC training. Most respondents (30.6%) are ready to devote 2-3 hours per week to training.

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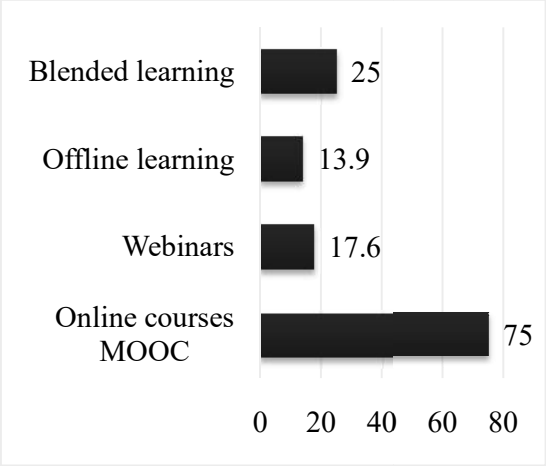

Fig.1. What is the most convenient training format for teachers? (%)

When selecting a MOOC, teachers aim to obtain micro-credentials for various purposes: the vast majority of respondents (80.6%) - to expand their professional knowledge and skills, 58.3% - for personal development, and 36.1% - to improve work efficiency (fig.2).

To reduce the risk of not completing a MOOC online course and, consequently, not obtaining a micro-credential, it is necessary to identify the obstacles that may hinder this. According to surveyed teachers, the main reasons may be lack of time (58.3%), financial constraints (41.7%), and family circumstances (33.3%). It should be noted that very few of those surveyed chose reasons related to military actions and lack of electricity.

When choosing MOOCs, teachers focus on the relevance of a particular profession in the labor market. Despite the ever-increasing demands of society on teachers, some of them choose micro-credentials for self-development.

To develop relevant MOOCs and implement them on educational or academic platforms, it's crucial to analyze the areas of interest for teachers in obtaning micro-credentials. Among a wide range of fields, 44.4% of teachers chose innovative teaching technologies, 36.1% selected inclusion, and 27.8% opted for digital skills.

Conclusions

Over the past 10 years, several educational platforms have gained popularity in the Ukrainian educational landscape (Vseosvita, Osvityoria, Na Urok, Osvita Nova, etc.), and new ones continue to emerge. Teachers frequently attend webinars on these platforms, which is why 72.2% of respondents indicated they would seek information on educational platforms. The majority of teachers (69.5%) plan to undergo MOOC training on pedagogical support for students in inclusive classrooms at the Drohobych Ivan Franko State Pedagogical University and obtain micro-credentials.

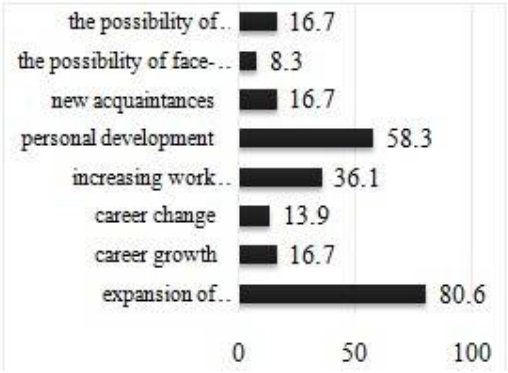

Fig.2. Expectations of teachers from obtaining micro-credentials (%)

This research examines teachers' willingness to pursue micro-credentials during challenging times, particularly in the context of war. Findings indicate that teachers are open to obtaining micro-credentials, driven by various motivations. Their self-organization and self-control suggest a growing trend of micro-credential acquisition for professional development. However, the study's limitations include the research design and low response rate. Future research should employ standardized methodologies and a broader range of evaluation methods.

Recommendations

Educational program developers, school principals, and teachers should consider the relevance of micro-credentials in the labor market. MOOC developers for teacher professional development in Ukraine should focus on flexibility, relevance, and personalized learning experiences, addressing the unique challenges and interests of teachers.

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The quality assurance for micro-credentials in institutions of higher education

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Abstract

Determining the quality of a programme for obtaining micro-credentials is not easy. Stakeholders are those who determine quality. In our case, this is the Ministry of Education and Science of Ukraine, an educational institution, a learner, a learner's parents, etc. Quality assurance for micro-credentials in higher education institutions (HEI) should be based on the 7 principles of quality management. We have selected the following key components of quality assurance in micro-credentials: regulatory compliance, adaptability and leadership, robust data collection and validation, quality analysis and performance improvement, focus on the learner, orientation to the labour market. Quality assurance of micro-credentials in HEIs requires the implementation of quality standards, such as ISO 9001. Continuous quality improvement should also be implemented, for example using the Plan-Do-Check-Act cycle. We believe that to ensure the quality of micro-credentials, it is advisable to focus on the following aspects: performance indicators and targets, quality improvement objectives, total quality management, assessment at unit level, scoring system for evaluating changes, causal model for effectiveness, participants' awareness.

Introduction

The rapidly developing field of micro-credentials in professional and higher education requires the development of appropriate strategies for quality assurance.

In general, quality is defined as compliance with requirements. Quality is a “degree to which a set of inherent characteristics of an object fulfils requirements” (International Organization for Standardization, 2015, 3.6.2).

Determining the quality of an educational programme, in particular, a programme for obtaining micro-credentials is not easy. Who defines quality? Stakeholders are those who determine quality. In our case, this is the Ministry of Education and Science of Ukraine, an educational institution, a student, a student's parents, etc.

How to determine the quality of education? There should be a foundation on which the quality assurance of micro-credentials in higher education institutions should be based. Therefore, the purpose of our research is to find a foundation for quality assurance of micro-credentials in higher education institutions.

The main result

One of the documents that can serve as a basis for quality assurance of micro-credentials in higher education institutions is ISO 9001:2015 Quality Management Systems — Requirements. It specifically defines the **7 principles of quality management**: customer focus, leadership, engagement of people, process approach, improvement, evidence-based decision making and relationship management (International Organization for Standardization, 2015, 0.2). C. Nahil describes them in more detail:

1. Customer focus - The ultimate focus of quality management is to meet and exceed customer expectations.
2. Leadership - Unify the purpose and direction of your workforce and create productive environments for all employees to pursue quality objectives.
3. Engagement of people - Effectively and efficiently managing quality at all levels of your organization requires deep trust and respect for all employees and stakeholders.
4. Process approach - An electronic quality management system (EQMS) includes a wide

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array of interrelated processes to produce consistent and predictable results.

5. Improvement - Risk-based thinking and quality management aren't one-off events. Successful organizations focus on continuous improvement.
6. Evidence-based decision making - basing your decisions on analysis and evaluation of data is the best way to minimize risk.
7. Relationship Management - quality management extends beyond internal operations to include how you manage relationships with external partners like your suppliers (Nahil, 2020).

Based on the analysis of literary sources (Noferi et al., 2004), (Underwood et al., 2006), (Shechter et al., 2023), we have selected the following **key components** of quality assurance in micro-credentials:

- Regulatory Compliance: the programme must meet European, national and institutional regulatory requirements in the areas of micro-credentials and education.
- Adaptability and Leadership: quality assurance units in education institutions must have the capacity and leadership to adapt to change caused by the fast-moving labour market and the need for micro-credentials.
- Robust Data Collection and Validation: the initial emphasis of the quality assurance process should be on robust data collection, validation, and appropriate analysis of what is appropriate to do with the use of information technologies.
- Quality Analysis and Performance Improvement: programme developers should focus on providing programme quality analysis and improving programme effectiveness, which are critical to providing continuing quality education.
- Focus on the learner: the programme should take into account the needs of learners and be based on the principles of personalization and individualization.
- Orientation to the labour market: the programme should focus on the changes taking place in society, industry and the labour market, with the aim of updating knowledge and their compliance with the modern level of science and technology.

Quality management planning is a crucial aspect of the quality assurance for micro-credentials in higher education institutions. First, everything begins with the development of a **quality management plan** (International Organization for Standardization, 2015), (*Management System Guidance*, n.d.). The first step is all about setting specific, measurable, achievable, relevant and time-bound (SMART) quality objectives. Strategies and approaches are then determined for achieving established quality objectives (see more details (Griffiths, 2024)).

Next, we should pay attention to the definition of quality requirements. Here, the focus shifts to understanding and documenting customer expectations regarding the quality of the product or service. This involves a selection of relevant standards (for example, ISO, State standards of Ukraine) and specifications to which service must comply. The third step involves identifying the main project processes that impact quality and Key Quality Indicators (KPIs) to measure success in achieving quality objectives.

Following this, the development of quality procedures and documents takes place which includes a description of quality control and verification methods at each stage of the project as well as the preparation of necessary documents such as checklists, quality reports, test plans, etc. The fifth step involves defining roles and role responsibilities. For this, a quality management team consisting of persons responsible for quality management is appointed. Each group member is assigned clear roles and responsibilities.

The next step (training and development of staff) includes holding training sessions for the team in order to increase their knowledge and skills in the field of quality management and creating a culture of continuous learning and improvement in the field of quality. For planning the quality assurance of micro-credentials in higher education institutions are important monitoring and quality control. It assumes regular internal and external audits to verify compliance with quality standards and also collecting feedback from customers and the project team to identify problems and opportunities for improvement. The eighth step is the analysis and improvement of processes. Data on quality indicators is regularly analysed to identify trends and deviations. After that identification and implementation of measures to eliminate identified problems and deficiencies in processes are carried out.

Finally, the process concludes with reporting and documentation. Regular reports on the quality status of the project are prepared for management and stakeholders. The results learned during the project are documented for future reference, ensuring continuous improvement in quality management practices.

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Through these quality management planning steps, it is possible to ensure that the quality assurance of micro-credentials in higher education institutions will be at a high level.

Quality assurance of micro-credentials in higher education institutions requires the implementation of quality standards, such as ISO 9001. For implementation and quality assurance for micro-credentials in higher education institutions, it is necessary to implement quality standards and define of roles and responsibilities of persons who will participate in this.

To implement the first task, it is necessary to identify standards relevant for institutions, such as ISO 9001 for quality management systems; analyse the compliance of standards with existing processes and requirements for the implementation of micro-credentials; develop a plan to adapt the selected standards, including necessary changes in processes and documentation; prepare staff for changes through education and training to ensure correct understanding and implementation of standards. After that, higher education institutions need to appoint a Quality Manager or create a specialized quality management team; clearly define the roles and responsibilities of each member of the team regarding quality assurance; distribute responsibilities so that each stage of the quality management process is covered by responsible persons; ensure regular quality communication and reporting between team members and management.

When all these processes are completed, the higher education institution needs to carry out quality control and evaluation. For this, in particular, the following methods and practices of quality assurance can be used:

1. Use checklists to regularly check compliance with quality requirements at each stage of the project.
2. Conduct internal quality audits to identify and address potential problems at an early stage.
3. Apply statistical quality control techniques (e.g. control charts) to monitor process stability and compliance.
4. Implement change management processes to control and document any changes that may affect project quality.

It is also appropriate to implement continuous quality improvement, for example using the Plan-Do-Check-Act cycle. PDCA (plan–do–check–act) is an iterative design and management method used in business for the control and continual improvement of processes and products (Tague, 2005, 390–392). PDSA represents a four stages cycle, namely: 1) Plan – the change to be tested or implemented; 2) Do – carry out the test or change; 3) Study – based on the measurable outcomes agreed before starting out, collect data before and after the change and reflect on the impact of the change and what was learned; 4) Act – plan the next change cycle or full implementation (*Plan, Do, Study, Act (PDSA) Cycles and the Model for Improvement*, n.d.).

In order to implement continuous quality improvement through the implementation of the PDCA cycle in a higher education institution, it is necessary to plan for improvement by identifying areas for improvement and setting goals for quality improvement; implement planned improvements by experimenting with new methods and approaches; check the results of implemented changes by analysing data and evaluating effectiveness; act on results, capturing successful practices and adjusting unsuccessful ones to achieve continuous quality improvement.

We believe that to ensure the quality of micro-credentials, it is advisable to focus on the following aspects:

- Performance Indicators and Targets: Quality assurance involves specifying performance indicators and setting targets for acceptable proficiency (Daly, 2022).
- Quality Improvement Objectives: Quality management includes addressing methods of continuously improving reliability, efficiency, and utilization of services (Daly, 2022).
- Total Quality Management (TQM): TQM, which goes beyond conventional Quality Control (QC) procedures, encompasses technical accuracy, equipment and supplies, staff training, financial management, lab safety, and communication (Naz, 2006).
- Assessment at Unit Level: Judging the effectiveness of quality assurance programmes at the unit level allows for discrimination between effects due to the monitoring institution and achievements attributable to the entity under surveillance (Lack & Gerhardinger, 2010).
- Scoring System for Evaluating Changes: A scoring system is adopted for evaluating incremental changes of performance indicator values in successive years, which assists in assessing the effectiveness of quality assurance programmes and identifying areas requiring improvement (Lack & Gerhardinger, 2010).
- Model for Effectiveness: A causal model needs be developed to measure the effectiveness of Internal

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Quality Assurance (IQA), accounting for various 7 principles of quality management such as organizational culture and leadership (Seeorn, 2005).
- Participants' Awareness: Further education and training are needed to ensure all staff know the quality assurance systems (Blumen et al., 2011).

Conclusions

So, adherence to the principles of quality management, key components of quality assurance, identification and implementation of quality standards, implementation of the model of continuous quality improvement and consideration of the aspects identified by us will help higher education institutions to ensure the quality assurance for micro-credentials.

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Micro-credentials - lifelong learning for in-service teachers

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Abstract

Lifelong learning for in-service teachers is seen as a crucial element to ensure quality education, adaptability, and the overall success of educational systems.Continuous Professional Development (CDP) is essential for maintaining high standards of teaching quality and addressing the evolving needs of learners. The EU highlights the importance of developing teachers' skills in innovation and creativity, as student-centered learning approaches are crucial for engaging students and fostering an active learning environment.
Furthermore, the EU advocates for the formal recognition of teachers' professional development through certification and incentives to encourage participation in lifelong learning activities.Micro-credentials support this culture of lifelong learning, encouraging teachers to continue developing their skills throughout their careers.By breaking learning into smaller, achievable milestones, teachers are more likely to see CPD as an ongoing, manageable and rewarding activity.

Key needs in teachers lifelong learning approach

The European Union emphasizes several key needs according to the aspect of lifelong learning for in-service teachers. In this paper I would like to focus on three main needs that were stated by the EU. These needs show the importance of Micro-credentials as a manageableand rewarding activity

Continuous Professional Development (CPD)

Continuing Professional Development refers to the ongoing learning activities that professionals undertake to develop and enhance their skills throughout their careers. It represents a commitment to lifelong learning and aims to continuously improve personal skills, proficiency, and professional knowledge. CPD encourages individuals to proactively seek opportunities for learning, refreshing knowledge, improving skills, or staying updated with industry developments.Practically, CPD encompasses a wide range of activities, such as training courses, educational events, gaining new qualifications, or learning new aspects of one's role. This approach ensures that learning is intentional and proactive, rather than reactive, with individuals documenting and tracking their acquired skills, knowledge, and experience over time.CPD employs various learning methodologies, including courses, seminars, workshops, conferences, webinars, and eLearning programs. It also involves the exchange of best practices, thoughts, and ideas, all aimed at improving individual capabilities in the workplace (The CPD Certification Service, 2020).
Adaptation to Digital and Technological Changes
Teachers are encouraged to engage in trainings to improve their digital literacy and integrate digital tools effectively into the classroom. This digital transformation of in-service teachers requires appropriate and research-based frameworks. A promising model is the TPACK (Technological Pedagogical Content Knowledge) by Mishra and Koehler, which offers a method for modeling the complex relationships when using technology in specialist teaching and is increasingly receiving attention. The model is based on Shulman's assumption that teaching is only successful when teachers' content knowledge (CK) and pedagogical knowledge (PK) are linked together. Mishra and Koehler supplemented and examined the interactions between CK and PK at the level of technological knowledge (TK). According to the authors, TK includes skills that are required to operate, learn and adapt to existing and new technologies.
In this context, PCK includes the pedagogical practices and learning goals, TPK describes the relationship between technologies and pedagogical practices and TCK analyzes the relationships between technologies and content learning goals. The three components together resulted in a complex network of technology-related expertise, the TPACK model. TPACK forms the intersection of TPK, PCK and TCK and shows the composition of all areas of knowledge in the teaching system (Schneider & Scholz, 2022).

Fostering Innovation and Creativity

Promoting innovation has not yet been uniformly defined in the context of teaching and studying.Innovation management with a general focus on teachinghas so far occurred as research

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into specific fields of application such as diversity management
or e-learning. (Internal university) innovation funding complements this form of innovation managementthrough incentive systems and support programs(Bußß& Berk, 2021). The European Union highlights the importance of developing teachers' skills in innovation and creativity.Student-centered learning approaches are crucial for engaging students and fostering an active learning environment.Creative teaching methods promote engagement and deep learning by encouraging students to think critically, solve problems, and express ideas innovatively. These approaches include project-based learning, gamification, role-playing, and using digital tools to enhance interaction. By encouraging active participation and adaptability, creative methods help cater to diverse learning styles, making education more effective and enjoyable for both students and teachers.

Micro-credentials as a future-oriented solution

Micro-credentials have been identified as an effective way for addressing skill gaps, providing participants with tangible proof of their newly acquired competencies, which is critical in meeting EUs key needs discussed earlier in this paper.By breaking learning into smaller, achievable milestones, in-service teachers are more likely to see lifelong learning as amanageable and ongoing activity.Unlike traditional transcripts, micro-credentials bring several benefits, such as transferability, portability, transparency, and ownership, which are largely tied to their digital nature. Learners may pursue micro-credentials for diverse reasons, including personal development, and these can be obtained independently of formal education (Kiiskilä, Kukkonen & Pirkkalainen, 2023).
The increase of platforms that manage digital credentials has enlargedthe awareness of verifiable Micro-credentials. In this process, providers aim to standardize these across educational institutions globally.Despite research on the benefits of micro-credentials, empirical studies on the value of digital credentials from the learner's perspective remain scarce.The CRED4TEACH project responds to the needs of higher education institutions and educational decision makers towards providing high-quality, responsive, inclusive, flexible and competence-based training provisions to in-service teachers across various educational sectors. The project's solution is to establish Micro-credentials, to enhance the opportunities for teacher professional development.

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Micro-credentials as a possible alternative to formal CPD courses for teachers in the coming years

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Abstract

Micro-credentials have emerged as a flexible and innovative educational model, beneficial both for students and for teachers seeking to enhance their skills in response to the rapidly evolving labour market. This paper explores the role of micro-credentials in strengthening teacher competencies in Montenegro, focusing on the outcomes of the Cred4Teach project. It highlights the advantages of micro-credentials over traditional courses, particularly in terms of targeted skill development and adaptability to professional needs. Despite the potential benefits, challenges such as recognition and standardization remain. The paper advocates for the establishment of clear frameworks and quality assurance measures to ensure that micro-credentials are effectively integrated into the educational landscape, thereby empowering teachers and improving educational quality in Montenegro.

Introduction

In recent years, micro-credentials have established themselves as an innovative form of education that responds to increasingly rapid changes in the labour market. These short programs enable individuals, especially teachers, to improve their skills and knowledge in a flexible way, adapting to the needs of modern education. Given the importance of continuing professional development (CPD) for teachers, micro-credentials are emerging as a potential alternative to traditional, formal courses, offering specific and applicable skills that can empower teachers in their daily work. This paper provides an overview of how micro-credentials can contribute to strengthening teacher competencies in Montenegro, taking into account the implemented activities and the achieved results of the Cred4Teach project.

Micro-credentials in higher education: Enhancing skills and meeting labour market demands

Although they do not represent a new topic, micro-credentials have become an increasingly present topic in higher education and other areas of informal learning in recent years. One of their key features, as well as advantages, is precisely that they enable the improvement of skills through short programs. In this way, the knowledge acquired in formal education is upgraded and helps those interested to be more prepared for the rapidly changing labour market. Micro-credentials also facilitate adaptation to professional needs and encourage cooperation between universities and the labour market.

Unlike traditional formal courses, which mostly offer comprehensive programs with accredited certificates and clear assessment criteria, micro-credentials provide a more flexible but less standardized framework. Formal programs often include a longer duration and greater scope of content, while micro-credentials are shorter and focus on specific skills.

The increasing use of micro-credentials emphasizes the need for their clear definition and regulation, in order to ensure quality and recognition by employers. Many international initiatives and educational institutions are working to create a clear framework for micro-credentials, with the aim of their recognition within education systems and beyond. The key challenge is quality assurance, which contributes to easier recognition of micro-credentials in the labour market.

Thus, for example, UNESCO (UNESCO, 2022) emphasizes the importance of standardization and quality assurance in the development of micro-credentials, emphasizing through the definition that micro-credentials must meet quality standards. The Microbol project (Microbol, 2020) defines the principles on which the quality assurance of micro-credentials should be based and emphasizes the connection of micro-credentials with the Bologna process and European qualification frameworks. Through the Microbol project, a micro-credential is defined as a smaller learning program focused on specific skills or knowledge, which is evaluated according to ECTS credits and quality standards.

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"A micro-credential is a small volume of learning certified by a credential. In the EHEA context, it can be offered by HEIs or recognised by them using recognition procedures in line with the Lisbon Recognition Convention or recognition of prior learning, where applicable.
A micro-credential is designed to provide the learner with specific knowledge, skills or competencies that respond to societal, personal, cultural or labour market needs. Micro-credentials have explicitly defined learning outcomes at a QF-EHEA/NQF level, an indication of associated workload in ECTS credits, assessment methods and criteria, and are subject to QA in line with the ESG". (Microbol, 2020)
What is common to all initiatives dealing with the topic of micro-credentials is the fact that micro-credentials should enable clearly defined standards and assessment processes, enabling the transferability and recognition of these qualifications. Despite different definitions, all initiatives agree that micro-credentials are short, focused programs designed to address specific social and market learning needs.

Micro-credentials for CPD courses

When it comes to the professional development of teachers, it should be a continuous process, during which teachers (at all levels of education) will strengthen their skills. There are numerous ways in which it is possible to implement this type of program - workshops, mentoring or research activities that are widely available.
Micro-credentials for continuous professional development programmes, specifically for teachers, are not significantly used as a model and type of program to be offered for these needs. Although they have the potential, due to the very type and characteristics of the program, to improve and support the professional development of teachers, their application has not yet taken root. Even if micro-credentials were to be developed, which would be aimed at the professional development of teachers, additional questions and dilemmas arise regarding the way to recognize such programs by other stakeholders, the evaluation and duration of such programs, comprehensiveness, etc.
Different practices are applied in different countries:

- In Estonia, professional development for teaching staff is a priority, regulated by a framework that requires teaching competencies and regular certifications, which support career advancement. Estonia has developed tools, including an analytical tool for teachers and the Steplab platform, to improve teachers' skills and leadership abilities (British Council (2021).
- Germany is working to establish common standards for teacher development harmonized with the EU, but there are no specific national guidelines (Eurydice, 2024).
- Turkey mandates continuous training for teachers, which is organized and regulated by the Directorate for Teacher Education and Development (Eurydice, 2024).
- Portugal regulates centers for the qualification of adults, but teachers in higher education institutions do not have formal requirements for continuous training (Eurydice, 2024).
- In Slovenia, professional development is encouraged through appointment conditions, with a break provided after six years of service (Eurydice, 2024).
- Croatia assigns responsibility for teacher development to institutions according to the Law on Scientific Activity, with the support of EU-funded projects (BAQUAL, 2020-2022).

It is clear that under the influence of rapid technological development, changes in the way of learning and different habits of the new generations of students, it is necessary to continuously strengthen teacher competencies so that teachers can keep up with the rapid changes in the educational ecosystem. Strengthening these competencies should be one of the strategic priorities of national governments, to encourage and enable the development of further, more concrete measures to improve competencies.
Bearing in mind the characteristics of micro-credentials, it can be concluded that they can represent a good basis for the development of these types of programs, which will respond to rapid changes in the market, will be flexible enough to adapt to the needs and requirements of the market, but also be recognized in some future work.

Programs for the professional development of teachers in Montenegro

Modern education requires teachers to have skills and knowledge that will respond to the increasingly complex needs of the student population.

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The research conducted through the BAQUAL project (BAQUAL, 2020-2022) showed that many university teachers in Montenegro do not have the pedagogical and didactic skills necessary for successful teaching, as well as that a large number of study programs do not provide for the study of teaching methodology, which is a significant drawback.

That is why, through the project "Integration of key competencies in the Montenegrin education system" (https://www.ikces.me/), the Agency developed a supplementary standard for the accreditation of initial teacher education programs with the aim of strengthening teacher competencies. This standard applies to programs that qualify teachers to work in primary and secondary schools, including pedagogical, psychological, didactic and methodical skills. However, realizing the limitations that exist when it comes to the application of this standard, it is necessary to additionally initiate the development of various programs to strengthen teacher competencies, as well as their evaluation and recognition by educational institutions.

Additionally, although it is not strategically recognized at the state level, the need to strengthen teacher competencies is also recognized through standard 1.5 of the European guidelines and standards (Standards and Guidelines for Quality Assurance in the European Higher Education Area - ESG, 2015), which is applied in the evaluation procedures of institutions of higher education. The guidelines of this standard imply that educational institutions can ensure the competence of teachers and to implement transparent processes of employment and professional development.

The current legal framework of Montenegro does not recognize micro-credentials as short programs or courses, although it recognizes the need for accreditation of lifelong learning programs offered by higher education institutions.

Bearing this in mind, the foundations for improvement in this area have been laid through the Cred4Teach project. The Agency for Control and Quality Assurance of Higher Education has proposed the National framework for micro-credentials (MC, recommendations - Montenegro, 2024), which defines a models for the implementation of the micro-credential program that will to strengthen teacher competencies based on practical programs that higher education institutions will develop and implement in pilot form. The proposed framework is based on two models, depending on who are the target groups that would attend micro-credentials to strengthen teacher competencies:

1. Model 1 - the target group are students and includes the addition of micro-credentials to existing accredited study programs, by introducing a new micro-credential, without the need for additional accreditation, if the change, in accordance with the Law on higher education, is below 30 ECTS credits.
2. Model 2 - is intended for teaching assistants, professors and other teachers (from preschool to high school level of education). This model implies the development and accreditation of micro-credentials, in order for them to be recognized and recognized on the labour market.

Through the proposed two models, the basis for the creation of a comprehensive micro-credential program would be created, which would have the possibility, through short courses, with the use of different technologies, to enable interested participants in the educational process to strengthen their teaching competencies. A special focus should be on the continuous improvement of the competencies of the participants themselves (from different target groups) and of these short courses, especially bearing in mind the impact of rapid changes in modern society on the entire educational process.

Conclusion

Micro-credentials offer a promising approach to enhancing teachers' professional skills, enabling flexible learning and quick adaptation to shifts in the educational landscape. Despite challenges related to their recognition and standardization, implementing these programs can bolster teacher competencies and elevate the overall quality of education. It is essential for educational institutions, alongside relevant government agencies, to establish clear guidelines and standards for micro-credentials to ensure their recognition and value in the job market. This effort necessitates collaboration among all stakeholders in the education system to promote sustainable, high-quality teacher development that meets the demands of modern society.

In Montenegro, while the Law on Higher Education does not currently recognize micro-credentials, it does acknowledge special training programs within higher education aimed at lifelong

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learning. By developing these specialized training programs, institutions can create short courses (micro-credentials) that address the increasing demands of the labour market and the needs of students seeking to enhance their skills and competencies. However, it is important to emphasize that while micro-credentials provide significant advantages for professional development, they should not entirely replace traditional continuing professional development (CPD) courses.

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Micro-credentials Implementation and Validation at the Higher Education Institution Level (Ukrainian Experience)

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Abstract

Introducing and validating micro-credentials at the level of higher education institutions (HEIs) in Ukraine is a key step in integrating the national education system with the European education area. The Ukrainian higher education system differs from the higher education systems of European countries; nonetheless, Ukraine's strategic consolidation course with the European Union requires adapting and harmonizing approaches to education, including introducing new teaching methods, educational technologies, and concepts. One of these approaches is micro-credentials, which have proven themselves well in Europe and are actively developing in Ukraine. Such micro-credentials are short skill-targeted courses that allow higher education students to acquire specific skills and competencies in demand in the labor market, complementing formal education.
Applying elements of informal education through micro-credentials is enabled by HEIs' autonomy, which Ukrainian laws on education and higher education guarantee. This envisages new prospects for developing flexible and individualized educational trajectories for higher education students. This paper examines the current state of implementing micro-credentials in some Ukrainian universities and, in particular, analyzes the advantages and challenges these institutions face. Prospects for further development of the micro-credentials system, including issues of their validation and integration into the overall structure of higher education, are considered. The authors emphasize that the development and further implementation of micro-credentials will increase the competitiveness of Ukrainian higher education institutions and facilitate their further entry into the European educational space.
Keywords: Micro-credentials, Higher Education, Validation, Informal Education, Autonomy of Higher Education Institutions

Introduction

In the current context of globalization and integration into the European educational space, Ukrainian institutions need to apply new approaches and innovations to the educational process. One of these approaches is the implementation of micro-credentials – short-term courses aimed at equipping learners with specific practical skills and competencies that meet the demands of the modern labor market (Zhurylo, March 20-21, 2023, pp. 270-271). Thanks to their autonomy, Ukrainian higher education institutions have started actively adopting this tool.
To develop flexible educational pathways, the National Agency for Higher Education Quality Assurance (NAQA) has proposed Recommendations for the Implementation of Micro-Credentials in Ukraine (Semigina et al., 2024, p.5), aimed at ensuring greater individualization of the educational process and adapting it to the needs of the modern labor market. These recommendations suggest creating academic programs that allow students to obtain individual micro-credentials in specific areas and combine them according to their professional goals or interests. This approach will foster the development of practical skills and competencies in various fields, allowing faster adaptation to the constantly changing demands of the labor market, driven by technological advances and globalization. Implementing micro-credentials also unlocks new opportunities for cooperation with international

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partners, creating conditions for learners' mobility and recognition of their achievements on a global scale.

Based on the experience of implementing micro-credentials at the Ukrainian Catholic University, Lviv, students are offered a range of courses consisting of elective disciplines studied during the 3rd and 4th years of bachelor programs. Among the micro-credentials, the university provides a number of modern courses in project management, security studies, communication, fundamentals of psychology and psychotherapy. However, even though the university offers programs in engineering fields such as computer science, IT, and business analytics, no micro-credentials in engineering are currently being implemented. Additionally, there is no option for individuals to obtain micro-credentials to enhance their academic and research credentials (such as a replacement for specialized courses required for professional development, which demand in-depth study of subjects within a qualification program and do not allow students the flexibility to select only the competencies they need).

At the same time, implementing micro-credentials at Kharkiv National Automobile and Highway University (Kuharenko, December 22, 2022, pp.158-159) includes stages of structuring competencies, aligning educational and professional standards, and creating individual learning plans with the LMS Moodle system. The main challenges include the complexity of standard alignment, uneven implementation by faculty members, and insufficient collaboration with the labor market. Therefore, to improve the micro-credential implementation process, closer integration with the real needs of industry and more extensive adoption at the university level are required.

Due to being involved in the CRED4TEACH ERASMUS+ program, Cherkasy State Technological University has gained its own experience in integrating micro-credential approaches into the teacher professional development process. As a part of cooperation with the NGO "Center for Social Communication", the initiative group of university teachers organized a micro-credential program "Modern Practices in Higher Education" (180 hours, 6 credits). According to their module of responsibility, 6 prominent professors of ChSTU provided lectures (online/offline), discussion meetings and adjusted assessments for those course participants who opted for a teacher development program with an accumulative system widely practiced in Ukraine. Some of the participants chose to master the complete micro-credential, while others selected only a few credits (the amount they needed to accumulate) or even only one single module if they were interested in it. The modules offered were those of interest for the teachers/university teachers in modern reality: New pedagogical competencies, Strategic approach to anti-crisis management, implementing changes and making effective decisions, Coaching: technologies for revealing the researcher's inner potential, Non-standard thinking, Academic integrity in the context of modern education, Theory and practice of using artificial intelligence in scientific research, Strategies and mechanisms of complex measures against disinformation in the modern IT environment, Effective communication in teamwork. Certificates were issued separately for each module to enable the participants to submit them to their institutions according to the procedure of their acknowledgement as a part of a teacher development program.

Ukrainian universities generally refer to micro-credentials heterogeneously, focusing on different aspects of their potential.

At the same time, both the concept of micro-credentials and the methods of their implementation in European educational institutions differ somewhat from how they are generally realized in Ukrainian universities. For example, in Europe, the development and successful implementation of micro-credentials are of interest not only to educational institutions, students, and quality assurance regulatory bodies but also to employers, government agencies, and accreditation departments. Such broad interest in both the education sector and businesses enables the creation of effective learning ecosystems. In both Europe and OECD countries, national, sectoral, and regional policymakers recognize that it is time to take coordinated actions on short courses and micro-credentials (Hijden& Martin, 2023, p.34).

The relevance of this article stems from the need to study the experience of implementing and validating micro-credentials at higher educational institutions in Ukraine and the European Union. This will foster the adaptation of the national education system to European standards and enhance the competitiveness of Ukrainian universities.

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The purpose of this research is to analyze the implementation of micro-credentials at the Ukrainian education system level, specifically by examining the advantages, challenges, and development prospects of this process. The main tasks include identifying successful practices in this area, assessing their impact on the quality of education, and determining the key stages of validating micro-credentials for their further integration into the overall higher education system.

Peculiarities of the Implementation and Validation of Micro-Credentials (Based on the Experience of Ukrainian and European Universities)

As noted (Semigina&Rashkevich, 2024, pp.110-122), implementing micro-credentials in Ukrainian higher educational institutions requires clear regulatory documentation. The first step at the university level is devising an internal Regulation on Micro-Credentials, which defines the course's purpose, objectives, structure, and evaluation criteria. At Cherkasy State Technological University, being part of the Erasmus+ project Nr. 101082858 "MOOC-based Micro-Credentials for Teacher Professional Development" (CRED4TEACH), this Regulation has been developed and is currently under discussion. It covers the following aspects:

- defining the duration and content of micro-credential programs;
- describing the procedure for implementing micro-credential programs;
- outlining the mechanisms for validating learning outcomes;
- providing recommendations for collaboration with employers to keep the programs relevant to the labor market;
- specifying requirements for the certificates;
- ensuring transparency of procedures that guarantee the recognition of micro-credentials by other institutions.

In drafting the Regulation, the experience of successful micro-credential implementation both in Ukrainian and foreign institutions was taken into account.

The feasibility of implementing micro-credentials within the framework of the project mentioned is ensured by the university's cooperation with the key European partners (Fachhochschule des Mittelstandes (FHM), Universidade Aberta (UAB), Tallinn University (TU), and Anadolu University (AU)) ("MOOC-based micro-credentials", 2024). The experience gained from the partners in micro-credential implementation will allow us to develop modern educational programs adapted to various academic and professional environments. This will ensure the effective integration of micro-credentials into practice-oriented learning (as exemplified by FHM), which is a model for preparing students for the modern labor market. Additionally, the further development of distance learning formats (as implemented at UAB) will allow for a broader introduction of micro-credentials into online education. Creating innovative curricula and their methodological support will promote flexibility and accessibility of learning programs for students from different countries (as seen at TU and AU).

To understand the efficiency of implementing micro-credentials, in addition to partner organizations, the experience of other foreign higher education institutions was also studied. For example, the implementation of the Dublin Institute of Technology (Ireland) experience has contributed to the successful implementation of micro-credential programs in the fields of engineering and IT, which can be recognized or aligned with the European Qualifications Framework (EQF).

At the same time, the ChSTU Regulation relies on the recommendations developed by the Ukrainian Engineering Pedagogics Academy (UEPA) ("International Cooperation" of 2024), which emphasizes innovative approaches to engineering education and pedagogy. These recommendations include integrating modern teaching methodologies, incorporating cutting-edge technologies into the learning process, and developing micro-credentials that facilitate the creation of flexible educational pathways for students. The Regulation acknowledges the need to prepare specialists capable of adapting to rapid changes in technological and professional fields, which is essential for shaping competitive professionals in the global labor market.

The experience of Taras Shevchenko National University, Kyiv (with certification programs in information technology, business analysis, and project management) reveals that including micro-credential programs allows university students and other individuals with specific qualifications to supplement their primary educational history. This offers flexibility to those who need to update or expand their qualifications to better meet the current demands of the labor market.

Advantages and Challenges of Introducing and Implementing Micro-Credentials in Ukrainian Higher Education Institutions

Analyzing the prospects of implementing micro-credentials in the educational process of Ukrainian

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universities, the following advantages can be highlighted (Rashkevych&Semigina, 2023, pp.392-396):

- Flexibility in learning: Micro-credentials allow students to acquire specific skills within a short period, significantly enhancing their competitiveness in the labor market and enabling them to adapt to rapid changes in technology and employer demands.
- Increased mobility of students and faculty: Implementing micro-credentials fosters the exchange of experience between Ukrainian and European institutions, promoting Ukrainian integration into the European educational environment.
- Support for the labor market: It allows higher educational institutions to respond swiftly to economic changes and adapt educational programs to provide students with modern, in-demand skills in the labor market.
- Integration of non-formal education: This enables the development of personalized educational trajectories, enhancing the autonomy of universities and contributing to the individualization of the learning process.

However, alongside these positive aspects and strengths of implementing micro-credentials in Ukrainian higher education institutions (especially in the context of military aggression from Russia), the following challenges arise (Londar, et al., 2022, pp.5-22):

- Lack of regulatory framework: Implementing micro-credentials requires clear state-level regulation, the components of which are either absent or only partially present. This creates difficulties in recognizing and integrating micro-credentials into the overall educational structure.
- Insufficient funding and resources: Implementing micro-credentials requires significant investments in learning platforms, the development of educational materials, and teacher training, the absence of which complicates the practical implementation of these programs.
- Low awareness of benefits among students and employers: Most Ukrainian students and employers have not yet grasped the full potential and prospects of implementing the micro-credential system, which results in limited demand for such educational programs and requires their active promotion.
- Difficulties in integrating with traditional educational programs: Most Ukrainian universities are not prepared to incorporate micro-credentials into their educational programs due to challenges in validating and aligning them with conventional qualifications.
- Lack of a unified system for validating and recognizing micro-credentials among universities: There are difficulties in standardizing evaluation criteria and transferring credits, complicating mutual recognition of qualifications between different higher educational institutions (not only between Ukrainian and European ones but among Ukrainian universities themselves).

Thus, implementing micro-credentials in Ukrainian institutions is a promising step that facilitates the integration of the Ukrainian higher education system into the European educational environment. At the same time, to successfully realize this approach, it is necessary to address issues of regulatory oversight, resource provision, and awareness-raising among all participants in the educational process, which is a key focus of the Erasmus+ project Nr. 101082858 "MOOC-based Micro-Credentials for Teacher Professional Development" (CRED4TEACH).

Peculiarities of the Implementation and Validation of Micro-Credentials (Based on the Experience of Ukrainian and European Universities)

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- defining the duration and content of micro-credential programs;
- describing the procedure for implementing micro-credential programs;
- outlining the mechanisms for validating learning outcomes;
- providing recommendations for collaboration with employers to keep the programs relevant to the labor market;
- specifying requirements for the certificates;
- ensuring transparency of procedures that guarantee the recognition of micro-credentials by other institutions.

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In drafting the Regulation, the experience of successful micro-credential implementation both in Ukrainian and foreign institutions was taken into account.

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To understand the efficiency of implementing micro-credentials, in addition to partner organizations, the experience of other foreign higher education institutions was also studied. For example, the implementation of the Dublin Institute of Technology (Ireland) experience has contributed to the successful implementation of micro-credential programs in the fields of engineering and IT, which can be recognized or aligned with the European Qualifications Framework (EQF).

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The experience of Taras Shevchenko National University, Kyiv (with certification programs in information technology, business analysis, and project management) reveals that including micro-credential programs allows university students and other individuals with specific qualifications to supplement their primary educational history. This offers flexibility to those who need to update or expand their qualifications to better meet the current demands of the labor market.

Advantages and Challenges of Introducing and Implementing Micro-Credentials in Ukrainian Higher Education Institutions

Analyzing the prospects of implementing micro-credentials in the educational process of Ukrainian universities, the following advantages can be highlighted (Rashkevych&Semigina, 2023, pp.392-396):

- *Flexibility in learning*: Micro-credentials allow students to acquire specific skills within a short period, significantly enhancing their competitiveness in the labor market and enabling them to adapt to rapid changes in technology and employer demands.
- *Increased mobility of students and faculty*: Implementing micro-credentials fosters the exchange of experience between Ukrainian and European institutions, promoting Ukrainian integration into the European educational environment.
- *Support for the labor market*: It allows higher educational institutions to respond swiftly to economic changes and adapt educational programs to provide students with modern, in-demand skills in the labor market.
- *Integration of non-formal education*: This enables the development of personalized educational trajectories, enhancing the autonomy of universities and contributing to the individualization of the learning process.

However, alongside these positive aspects and strengths of implementing micro-credentials in Ukrainian higher education institutions (especially in the context of military aggression from Russia), the following challenges arise (Londar, et al., 2022, pp.5-22):

- *Lack of regulatory framework*: Implementing micro-credentials requires clear state-level regulation, the components of which are either absent or only partially present. This creates difficulties in recognizing and integrating micro-credentials into the overall educational structure.
- *Insufficient funding and resources*: Implementing micro-credentials requires

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significant investments in learning platforms, the development of educational materials, and teacher training, the absence of which complicates the practical implementation of these programs.

- *Low awareness of benefits among students and employers*: Most Ukrainian students and employers have not yet grasped the full potential and prospects of implementing the micro-credential system, which results in limited demand for such educational programs and requires their active promotion.
- *Difficulties in integrating with traditional educational programs*: Most Ukrainian universities are not prepared to incorporate micro-credentials into their educational programs due to challenges in validating and aligning them with conventional qualifications.
- *Lack of a unified system for validating and recognizing micro-credentials among universities*: There are difficulties in standardizing evaluation criteria and transferring credits, complicating mutual recognition of qualifications between different higher educational institutions (not only between Ukrainian and European ones but among Ukrainian universities themselves).

Thus, implementing micro-credentials in Ukrainian institutions is a promising step that facilitates the integration of the Ukrainian higher education system into the European educational environment. At the same time, to successfully realize this approach, it is necessary to address issues of regulatory oversight, resource provision, and awareness-raising among all participants in the educational process, which is a key focus of the Erasmus+ project Nr. 101082858 "MOOC-based Micro-Credentials for Teacher Professional Development" (CRED4TEACH).

Validation of Micro-Credentials

Methods of validating micro-credentials play a key role in ensuring their recognition in the labor market and educational space. The main widely recognized validation tools are ("Quality Assurance of Micro-Credentials:", December 2023, pp. 62-63):

- *Open digital certificates (Open Badges)*, which are widely used in European universities, such as Ghent University in Belgium.
- *Accreditation of micro-credentials within national qualification frameworks*, as practiced, for example, at the University of Barcelona, Spain.

As for Ukrainian universities, digital certificates are popular for confirming acquired competencies (for example, Lviv Polytechnic National University issues certificates in IT and project management). Many Ukrainian universities use learning management systems (LMS) as tools for validating micro-credentials, which include automated testing and assessment of learning outcomes based on competencies ("Learning Management Systems", 2024). At the same time, Ukrainian universities enjoy a high degree of autonomy, allowing them to independently implement and validate micro-credentials according to their programs and educational needs, as well as considering employer demands when developing evaluation criteria and standards. This requires attracting varied approaches, standards, and tools, which leads to inconsistencies between institutions. Ukrainian universities aim to align micro-credentials with the European Qualifications Framework (EQF) to simplify recognition abroad and increase student mobility. At the same time, the state standardization will make progress at the desired pace more sufficient.

Thus, due to the lack of a unified state system, each institution establishes its own criteria for validating micro-credentials, relying on internal quality standards and labor market demands. This allows for variations in the validation process, ranging from the internal competency repositories to individual assessment procedures, which should overly contribute to improving the effectiveness of education and developing professional skills among the faculty. These features highlight the need for standardization and unification of approaches to simplify the validation process and enhance the transparency of micro-credential implementation in Ukraine.

Discussion of the Analysis Results

During the analysis of the processes of implementing and validating micro-credentials in Ukrainian higher education institutions, several key aspects were identified that will merit further discussion.

Firstly, the analysis showed that micro-credentials could become an essential tool for adapting educational programs to the needs of the modern labor market. In the context of rapidly changing technologies (Industry 4.0 Strategy) and increasing demands for professional skills, these learning formats allow universities to promptly update course content and offer learners more relevant and up-to-date knowledge, which, in turn, enhances graduates' competitiveness in the labor market.

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Secondly, the analysis results highlight the need to develop clear criteria for micro-credentials validation. The absence of unified standards in Ukraine complicates recognizing micro-credentials between educational institutions and employers. The introduction of validation standards could increase trust in these educational formats among learners and employers and ensure their alignment with international practices.

Thirdly, implementing micro-credentials effectively requires close cooperation between educational institutions and business representatives. Building partnerships with businesses can help design educational programs that meet actual market demands and organize practical training and internships for students.

The data obtained indicates that students highly value the flexibility provided by micro-credentials. This allows them to combine learning with work and personal commitments, positively impacting their motivation and success.

However, despite all the advantages, there are challenges associated with implementing micro-credentials. Among them are the need for training teachers and administrators in new learning formats, as well as the need for technical resources to support e-learning.

Thus, implementation and validation of micro-credentials in Ukrainian higher education have significant potential but require systematization, including the development of frameworks, collaboration with industry, and staff training. The results of this study can serve as a basis for further improvement of educational practices and policies in this area, and considering European experience, the gradual harmonization of educational approaches between Ukraine and the EU will expand the use of micro-credentials in the national education system (Kravec, October 25, 2022, pp.334-335).

Conclusions

The analysis of implementing and validating micro-credentials in Ukrainian higher education institutions has confirmed their relevance and potential for modernizing the national educational system.

As a result, the following conclusions have been made:

- Micro-credentials allow fast adaptation of educational courses to the labour market's needs, enhancing the relevance and practical value of the acquired knowledge. This creates opportunities for learners and professionals to integrate learning more effectively into their career development.
- One of the key challenges in recognizing micro-credentials is the lack of unified national standards. Standardizing these criteria would facilitate better alignment of educational programs across higher educational institutions and their further integration into the international educational environment.
- Implementing micro-credentials efficiently requires close cooperation between educational institutions and employers. This would help design educational courses that meet real business needs, equip students with practical skills, and maintain a high level of training.
- Due to the flexibility of the curriculum offered through micro-credentials and the freedom to choose specific courses, students demonstrate higher levels of motivation and readiness to learn. This also positively affects student success, particularly when balancing studies with work or other commitments.

The prospects for further development of micro-credentials in higher education in Ukraine lie in integrating international validation standards, improving the methodology for implementing micro-credentials and developing a national strategy that ensures the sustainability of this learning format. This approach will enhance the competitiveness of Ukrainian universities, promote their integration into the European educational environment, and better meet the demands of the digital economy.

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How to Become an Innovative Teacher: MOOC Courses: A Comfortable and Good Solution

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Abstract

This article explores how Massive Open Online Courses (MOOCs) serve as an accessible and effective pathway for teacher professional development, fostering innovative teaching methods and skills. It examines the need for innovation in education and the limitations of traditional teaching methods, highlighting how MOOCs support educators in integrating modern strategies such as flipped classrooms, project-based learning, and gamification. Case studies illustrate the transformation of teaching practices through MOOCs, showcasing personalized and student-centered approaches. Despite challenges in time management and self-discipline in self-paced courses, practical solutions—such as peer support groups and goal setting—help educators maximize their learning. Resources and links to key MOOC platforms are provided to guide educators in exploring and enrolling in courses that align with their goals and classroom challenges. This article demonstrates how MOOCs enable educators to remain effective and relevant in a rapidly evolving educational landscape.

Key words: *MOOC courses, innovative teacher*,

Introduction

In today's rapidly evolving world, education is undergoing profound changes. Traditional methods, once centered on lectures and rigid curricula, are being challenged by the demands of a digital society and the diverse needs of modern learners [1]. Students now require more interactive, personalized, and adaptable learning environments that encourage critical thinking, creativity, and collaboration. As education shifts to accommodate these needs, teachers are increasingly called upon to innovate and redefine their roles from mere knowledge transmitters to facilitators of dynamic learning experiences (Garrison & Anderson, 2003).
Innovation in teaching has become essential for fostering student engagement and adaptability. Innovative teaching encompasses a variety of strategies, such as using technology to create blended learning experiences, applying project-based and inquiry-based learning, and embracing flipped classroom models. These approaches are designed to make learning more meaningful, relevant, and accessible for students [2]. However, adopting these strategies requires continuous professional development, a challenging endeavor for busy educators.
This is where Massive Open Online Courses (MOOCs) have proven to be transformative. MOOCs offer teachers a flexible and affordable solution for professional development, making it easier to stay current with the latest educational methods and technologies. These courses, accessible from anywhere with an internet connection, allow educators to explore diverse topics, learn at their own pace, and join global networks of fellow educators. As this article will demonstrate, MOOCs provide a flexible, accessible, and effective pathway for teachers striving to become innovative, effective educators in an ever-changing educational landscape.

The Need for Innovation in Teaching

In an era where information and technology are advancing at unprecedented rates, the field of

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education is also expected to evolve. Traditional teaching methods—centered on rote memorization, lectures, and standardized testing—are increasingly inadequate in addressing the diverse learning needs and preferences of today's students. As society demands more flexible, adaptive, and personalized learning experiences, the need for innovation in teaching becomes clear.

Challenges of Traditional Teaching Methods.

Traditional teaching methods have long been the foundation of education, but they come with limitations that hinder students' ability to engage deeply with the material and develop critical skills. In a typical lecture-based classroom, teachers often deliver content in a one-size-fits-all format, which can disengage students who learn better through hands-on activities, group discussions, or visual aids [3]. The focus on standardized testing and memorization over critical thinking can also lead students to view learning as a passive activity, making it challenging for them to apply their knowledge in real-world scenarios. Furthermore, rigid curricula often leave little room for teachers to adapt lessons to the individual needs and interests of their students, limiting creativity and self-directed learning [4].

The Role of Technology, Digital Tools, and New Learning Paradigms.

Technology has opened new avenues for creating more engaging and personalized learning experiences. Digital tools, such as interactive simulations, online assessments, and collaborative platforms, enable teachers to move beyond traditional lecture formats and embrace innovative teaching approaches. For instance, blended learning, which combines online and in-person instruction, allows students to learn at their own pace while still benefiting from face-to-face interactions [5]. Similarly, flipped classrooms enable students to learn foundational content at home through videos or reading materials, reserving class time for active learning and problem-solving activities [6]. These digital tools are not merely supplements; they redefine the classroom environment by shifting the focus from teacher-centered instruction to student-centered learning.

New learning paradigms, such as project-based learning (PBL) and inquiry-based learning, further encourage students to take an active role in their education. In PBL, for example, students work on real-world a problem, which not only enhance critical thinking and creativity but also demonstrates the relevance of their studies to their lives outside of school [7]. These approaches, supported by technology, create learning environments that are adaptable, collaborative, and engaging—qualities that are essential in preparing students for the modern workforce.

Importance of Continuous Learning for Teachers

As educational tools and methodologies evolve, so too must the skills and knowledge of teachers. Continuous professional development is critical for educators to keep pace with new innovations and best practices. In this fast-paced educational environment, the traditional approach of earning a degree and teaching with the same techniques throughout one's career is no longer sufficient [8]. To stay relevant and effective, teachers must embrace lifelong learning, engaging in professional development opportunities that enhance their instructional techniques and help them integrate new technologies and methodologies into their classrooms.

MOOCs, for example, offer teachers flexible, affordable ways to stay updated on the latest teaching trends, digital tools, and learning strategies. By participating in continuous learning, teachers can cultivate a growth mindset, adapt to changes, and become better equipped to meet the evolving needs of their students [10]. This commitment to professional growth not only benefits teachers but also creates more enriching, adaptable, and innovative learning experiences for students.

Why MOOC Courses Are a Good Solution for Teachers

MOOC courses provide teachers with a flexible, accessible, and cost-effective pathway for professional development, making them a highly valuable resource in today's educational landscape.

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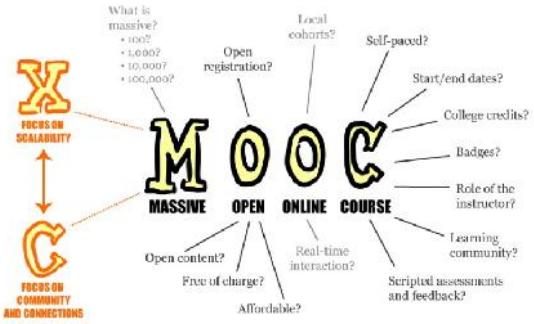

Fig. 1 Advantages and disadvanges of MOOC courses

- **Flexibility: Self-Paced Learning That Fits Into a Busy Teacher's Schedule.** One of the primary benefits of MOOCs is the flexibility they offer. Traditional professional development often requires teachers to attend in-person workshops or conferences at fixed times, which can be difficult to manage alongside teaching responsibilities. In contrast, MOOCs allow teachers to learn at their own pace, choosing when and how to engage with the material. For example, teachers can access MOOCs outside of school hours, during weekends, or over the summer, making it easier to fit learning around their schedules [11]. This self-paced format also provides teachers with the option to revisit content, allowing for deeper understanding and reflection on new concepts.
- **Accessibility: Available to Anyone with Internet Access, Regardless of Geographical Location.** MOOCs break down geographical barriers, offering high-quality courses to teachers across the globe, regardless of location. This accessibility is especially valuable for educators in remote or underserved areas where professional development opportunities may be limited. Unlike traditional courses, which often require travel to urban centers or institutions, MOOCs can be accessed from anywhere with an internet connection, making professional development equitable and inclusive. Many MOOCs are also available in multiple languages or with subtitles, further increasing accessibility for teachers worldwide.
- **Diverse Topics: Wide Range of Courses on Pedagogy, Technology in Education, and More.** Another significant advantage of MOOCs is the variety of topics available. Teachers can find courses on virtually any educational subject, from instructional design and classroom management to integrating technology and innovative pedagogies. This wide selection allows educators to tailor their professional development to their specific needs, goals, and interests [12]. For instance, a teacher interested in digital learning can explore MOOCs on blended learning or educational technology, while another focused on inclusive practices might enroll in courses on differentiated instruction and special education. This diversity empowers teachers to expand their expertise in areas that directly impact their teaching and students' learning experiences.
- **Cost-Effective: Often Free or Affordable Compared to Traditional Professional Development Programs**. Professional development can be costly, especially when considering expenses associated with traditional methods, such as tuition fees, travel, and accommodation. MOOCs offer a more affordable alternative, with many courses available for free or at a fraction of the cost of conventional programs. This affordability is particularly advantageous for teachers in schools with limited budgets or for those personally financing their professional growth [13]. Many MOOC providers, such as Coursera, edX, and Future Learn, offer free access to course content, while charging a nominal fee for certifications, making high-quality professional development accessible to a broader range of educators.

MOOCs provide teachers with a unique combination of flexibility, accessibility, diverse learning topics, and cost-effectiveness. By utilizing MOOCs, educators can pursue continuous professional development without disrupting their teaching duties, making it easier for them to stay current with the latest educational innovations and best practices. As a result, MOOCs are a practical and accessible solution for teachers who aim to foster engaging, dynamic learning environments for their students

How MOOCs Support Innovative Teaching

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MOOCs have become an essential tool for teachers seeking to adopt innovative teaching practices. By offering access to cutting-edge methods, digital tools, and technology-driven engagement strategies, MOOCs provide educators with the resources they need to transform their classrooms.

- **Examples of How MOOCs Help Teachers Integrate New Teaching Methodologies.** MOOCs play a pivotal role in exposing teachers to modern teaching methodologies like flipped classrooms, project-based learning (PBL), and inquiry-based approaches. Through MOOCs, teachers can learn both the theory and application of these methods, which are designed to foster student engagement and active learning. For instance, courses on platforms like Coursera and edX have specifically helped teachers implement the flipped classroom model, enabling them to deliver lectures through video for students to watch outside of class, thereby reserving class time for hands-on activities [14]. Research has shown that when teachers integrate such models after MOOC-based learning, students demonstrate higher engagement and performance, as they can apply theoretical concepts in a supportive classroom environment [15]. Similarly, project-based learning is supported through MOOCs, which offer teachers resources and strategies to create real-world projects that cultivate problem-solving and collaboration skills. Studies indicate that teachers who complete MOOCs on PBL feel more confident designing projects that connect curriculum content with practical applications, increasing student motivation and critical thinking.
- **Emphasizing Personalized Learning Experiences for Students.** Personalization has become a cornerstone of modern teaching, and MOOCs support teachers in adapting their instructional methods to meet diverse student needs. By learning how to incorporate adaptive learning technologies, differentiated instruction, and flexible assessment methods, teachers can offer tailored learning experiences that respond to individual student strengths and challenges. For example, MOOCs on adaptive learning provide insights into using digital platforms that track student progress and adjust content accordingly, enabling personalized learning paths within larger classes [16]. Teachers who have completed such MOOCs report that they can better identify student needs and deliver customized content, which leads to higher student satisfaction and improved outcomes. Moreover, many MOOCs include modules on Universal Design for Learning (UDL), a framework that promotes inclusivity by offering multiple means of engagement, representation, and expression. Teachers who implement UDL strategies gain the ability to create a more equitable classroom where all students can thrive, regardless of their learning styles or abilities [17].
- **Sharing Practical, Up-to-Date Knowledge in Technology, Digital Tools, and Student Engagement Strategies**. Staying current with technological advancements and engagement strategies is critical for educators in today's digital landscape. MOOCs provide practical, up-to-date knowledge in areas such as educational technology, digital assessments, and gamification. Platforms like FutureLearn and Udemy offer courses on using interactive tools like Google Classroom, Microsoft Teams, and virtual simulations, which have become vital for blended and online learning environments [18]. MOOCs on student engagement strategies also help teachers employ gamification and collaborative learning tools that enhance motivation. Gamified learning, which incorporates game mechanics like points, levels, and rewards, has been shown to increase student involvement and excitement for learning. Teachers who incorporate these techniques after completing MOOCs find that students are more motivated and participate more actively in class discussions and assignments, improving overall classroom dynamics and performance [19].

Through flexible, accessible, and relevant content, MOOCs empower teachers to integrate new methodologies, personalize instruction, and leverage modern engagement tools. These courses support educators in staying at the forefront of innovative teaching practices, making learning more interactive, inclusive, and effective for students.

5. Real-Life Examples of Teachers Benefiting from MOOCs

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MOOCs have proven to be a valuable resource for European educators looking to update their skills and incorporate innovative teaching practices. By offering access to high-quality, flexible, and relevant professional development, MOOCs allow teachers to transform their instructional methods and create dynamic learning environments.

Fig. 2. Transforming Education in the Digital Age

Below are some real-life examples and testimonials of European teachers who have benefitted from MOOC participation, showcasing the positive impacts of these courses on their teaching practices.

Case Studies or Testimonials from Teachers Who Have Transformed Their Teaching Practices Through MOOCs

Case Study: Enhancing Digital Literacy in Spain In Spain, a secondary school teacher completed a European MOOC on digital literacy and multimedia production. Before taking the course, the teacher relied primarily on traditional lectures and written assignments. However, the MOOC introduced her to a range of digital tools and techniques for creating interactive and visually engaging content. She adopted these strategies to produce multimedia lessons, including videos, podcasts, and interactive quizzes. As a result, her students reported increased engagement, and assessments showed a marked improvement in comprehension and retention [20].

Testimonial: Integrating Social Learning in Italy An Italian language teacher, participating in a MOOC on social and collaborative learning offered by the European Schoolnet Academy, shared that the course transformed her approach to student interaction. Through the MOOC, she learned how to implement peer-review systems, collaborative writing activities, and group-based problem-solving sessions. The course emphasized the benefits of social learning for language acquisition, which she successfully integrated into her classes. Her students now work in groups to review each other's assignments, enhancing both their language skills and teamwork abilities [21].

Examples of Innovative Teaching Methods or Projects Developed by Teachers Post-MOOC. Flipped Classroom in France After completing a MOOC on the flipped classroom model offered by the French MOOC provider FUN-MOOC, a French high school science teacher restructured her classroom to allow for more active, hands-on learning. She began by recording video lectures for students to watch at home, using in-class time for experiments and collaborative work. This new approach fostered a deeper understanding of scientific concepts and encouraged students to take more responsibility for their own learning. Evaluations showed that student engagement and performance increased significantly, especially in practical assessments [22]

Project-Based Learning in Germany. A German primary school teacher took a MOOC on project-based learning (PBL) through the Open Education Europa platform, aiming to make his science lessons more interactive and student-centered. Inspired by the MOOC, he designed a series of PBL units where students investigated real-world environmental issues, such as local water pollution and recycling practices. Students conducted research, created models, and presented their findings to the community. The PBL approach not only improved their understanding of scientific concepts but also fostered critical thinking and problem-solving skills. The MOOC provided practical guidance on project design and assessment, enabling the teacher to create a more engaging and impactful science curriculum [23].

Digital Game-Based Learning in Poland. In Poland, a teacher of English as a foreign language participated in a European MOOC on digital game-based learning (DGBL), which introduced her to game elements that can increase student motivation

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and engagement. After the course, she integrated online educational games and gamified quizzes into her lessons. For example, she used tools like Kahoot! and Quizlet to reinforce vocabulary and grammar in a fun, competitive format. The gamified approach resulted in higher student participation, as well as increased vocabulary retention and grammar skills. The teacher credited the MOOC with providing her the tools and confidence to successfully incorporate gaming in her language classroom [24]. Through these examples, it's clear that European teachers are benefiting from MOOCs by adopting new, innovative methods in their classrooms. These real-life cases show how MOOCs support teachers in creating more interactive, collaborative, and student-centered learning environments, ultimately leading to improved educational outcomes across Europe.

Potential Challenges and Solutions

While MOOCs provide teachers with accessible and flexible professional development opportunities, they also present several challenges, particularly around time management, maintaining discipline, and staying motivated in a self-paced environment. These obstacles are significant but can be effectively addressed with strategic solutions.

- *Time Management Issues When Juggling Work and Learning. For many educators, balancing teaching responsibilities with additional learning is challenging. Teachers often face demanding schedules, making it difficult to allocate time for MOOC coursework, particularly during the school year. Research from the European School net shows that teachers frequently report a lack of time as one of the biggest barriers to engaging in continuous professional development, especially when it's self-paced [24]*
- *Solution: Effective time management is essential to balancing work and study. One strategy is to designate a specific time each week solely for MOOC learning, treating it as a non-negotiable appointment. Teachers can also benefit from breaking down their learning goals into smaller tasks that can be completed in short sessions, such as watching a module video or completing a quiz. This method allows teachers to integrate learning into their schedules without overwhelming their existing commitments [24].*
- *Keeping Up with the Discipline and Motivation in Self-Paced Courses. Self-paced MOOCs give teachers the freedom to learn on their own schedule, but without the structure of traditional courses, it can be difficult to maintain the discipline and motivation required to complete them. According to Jansen at [22], many European teachers struggle with motivation in self-paced MOOCs, particularly if they feel isolated or lack accountability. When teachers don't have deadlines or regular feedback from instructors, it's easy to lose momentum.*
- *Solution: Setting personal deadlines and milestones can help teachers establish a structured approach to their MOOC learning. Additionally, joining study groups or forming online communities with other teachers taking the same MOOC can provide social interaction and accountability, making it easier to stay motivated. Research highlights the positive impact of peer learning networks in increasing completion rates for self-paced courses, as teachers feel supported and encouraged by sharing progress with others [23].*

Suggestions for Overcoming These Challenges

To help teachers succeed in MOOCs, it is essential to create a supportive learning environment.

- **Forming Learning Groups**: Teachers can form learning groups with colleagues or connect with others taking the same course. Studies suggest that collaborative learning is highly beneficial, as peer support fosters motivation and accountability [24]. By engaging in regular discussions, sharing resources, and setting shared goals, teachers can maintain a stronger commitment to their MOOC studies.
- **Setting Personal Goals**: Creating specific, achievable goals is another effective approach to navigating self-paced learning. Teachers can break down the course content into weekly goals, such as completing a certain module or assessment, to create a manageable timeline. According to research from the European Framework for the Digital

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Competence of Educators, setting clear, attainable goals helps teachers build confidence and track their progress [23].

- **Utilizing Progress-Tracking Tools**: Many MOOC platforms include features that allow users to track their progress, set reminders, and receive notifications. Teachers can take advantage of these built-in tools to stay organized and motivated throughout the course. Tracking tools can provide a visual representation of achievement, which reinforces motivation as teachers see their advancement over time [23].

Conclusion

- The rapidly evolving educational landscape underscores the need for innovation in teaching, making continuous professional development essential for modern educators. Traditional teaching methods alone are no longer sufficient to engage students or equip them with the skills required in today's world. As discussed, MOOCs provide a practical and accessible solution for teachers looking to update their skills, learn new methodologies, and implement digital tools in their classrooms. By offering flexibility, affordability, and diverse topics, MOOCs support teachers in becoming more adaptable and student-centered in their approach [25].
- Embracing MOOCs enables teachers to remain relevant, addressing the evolving demands of education while enhancing their instructional practices. As studies indicate, teachers who participate in MOOCs benefit not only from the content but also from connecting with a global community of educators, allowing them to exchange ideas and gain fresh perspectives [26] This continuous learning process fosters growth, keeps teachers engaged with current trends, and promotes innovation in their teaching methods.
- To those exploring ways to enhance their teaching practices, MOOCs offer a compelling opportunity to begin this journey. Platforms like Coursera, edX, and European Schoolnet Academy provide courses tailored for educators across various disciplines and skill levels. Teachers are encouraged to explore these platforms, identify areas they wish to develop, and take the first step by enrolling in a course that aligns with their professional goals. In doing so, educators can advance their skills, inspire their students, and contribute to a more dynamic and future-ready educational environment [27].

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Call to Action

- Provide links or resources where readers can find relevant MOOCs
- **Coursera**: Offers a wide range of courses from leading universities and organizations, including courses specifically focused on education, technology in teaching, and innovative methodologies. Teachers can explore options like *"Learning How to Learn,"* or *"Blended Learning Essentials."* Link: www.coursera.org
- **edX**: Known for its high-quality courses from top universities, edX offers a variety of education-focused MOOCs on topics like instructional design, flipped classrooms, and digital tools in education. Link: www.edx.org
- **FutureLearn**: This platform provides education-focused MOOCs from universities around the world. Courses on digital skills, student engagement, and inclusive education are commonly available. Link: www.futurelearn.com
- **Udemy**: A popular platform for practical, skill-based learning, Udemy has a range of courses on classroom management,

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Professional development of teachers priority for a quality education system

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Abstract

Today, the world and humanity are characterized by rapid changes. Obviously, education must respond to these changes at a fast pace. Today's education system should also focus on the professional development of teachers, which should be a priority in the education system. A teacher with continuous professional development is more effective in the learning process as he applies new approaches to teaching/learning.

This study examines the importance of professional development of teachers from the perspective of their needs in Gjirokastra district, including urban and rural school teachers. Its purpose is analyzed in two issues: 1) The importance of professional development of teachers as a need to improve teaching standards, to support the professional growth of teachers, to ensure quality education, as well as to promote and facilitate implementation of new initiatives. 2) the needs of teachers to grow professionally.

Using the questionnaires of 200 teachers of pre-university education, this study has observed 2 (two) findings: 1) the professional development of teachers is very important especially for new teachers and students in universities; 2) teachers have specific needs for small-scale recognition such as micro-credentials, unlike traditional professional development.

This study explains that training providers will understand how microcredentials can address specific teacher training needs.

Keywords: Microcredentials, training, professional development, training providers, specific teacher needs.

Introduction

Today, the world and the entire society are characterized by rapid economic, social and cultural changes. Education must respond to these rapid changes at a fast pace. Today's education system, among others, should also focus on the professional development of teachers, which should be a priority in the education system and is carried out through training. A teacher who always conducts training for his professional development and continuous development is more effective in the teaching process as he applies new approaches to teaching/learning. Professional development is important because teachers grow professionally and are updated with the latest in teaching/learning and technology in education. The purpose of teacher training is to educate the new generation. The more prepared and trained the teachers are, the more effective the students' knowledge. All along, the Ministry of Education and Sports has emphasized increasing the professionalism of teachers through training. The professional development of teachers is influenced by the needs of: the student, the teacher and the school itself.

The purpose of this paper is to examine the importance of teachers' professional development from the perspective of teachers' needs.

Continuing professional development of teachers is not just a professional obligation, but a journey where the teacher is constantly transformed. In this context, it is necessary to unite all institutional and human resources in order to ensure that teachers are equipped with the necessary knowledge and skills to face the challenges of the time and to provide a quality education for students. This can be achieved through a national program for the professional development of teachers, in which objectives and expected results are clearly defined, all training needs are addressed and roles and responsibilities are allocated for each institution.

A quality and inclusive education system must focus strongly on teacher investment. Teacher support should be an absolute priority not only financially, but also in professional development and meritocracy in the education system. These trainings are provided by Universities and various licensed NGOs. The trainings are conducted directly but also online as well as both

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combined and take place during three training days. Our teacher increases his professionalism on the basis of several standards. The teacher professional development package, of which the teacher professional standards document is a part, requires teacher professional development to have a strong focus on student outcomes.

All teachers should be given the opportunity to participate in professional development, which helps them "feed" and commit to their students' progress and success. Intensive continuous professional development oriented towards standards and measurable indicators helps teachers to "grow" and evaluate the progress of their performance. Teaching is the most important profession that affects the formation of the next generation and should be formed and developed based on standards, which define what every teacher should know, what skills they should demonstrate and what values and attitudes must be characterized.

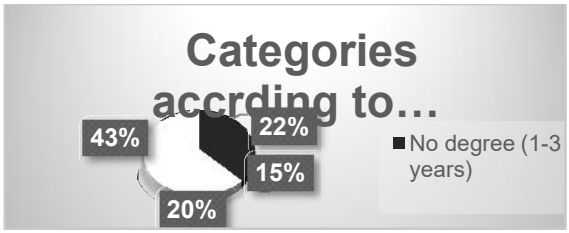
In recent years, we see that many students do not choose the profession of teacher in different subjects. There is a decline in students choosing Primary Education Teacher. Lack of choice in the teaching profession is a global crisis (Fletcher & Nace). The lack of selection of the teaching profession is coming and growing in our country but also in the United States (Garcia & Weiss, 2019). The number of new teachers is declining, but certified teachers are less likely to leave the profession according to studies (Brill & McCartney, 2008; Darling-Hammond, 2003; Gray & Taie, 2015; Smith & Ingersoll, 2004). Therefore, professional development is often used as a key avenue to potentially help improve teachers' teaching practices, increase teaching effectiveness, and increase teacher retention (Darling-Hammond & Richardson, 2009; DeMonte, 2013; Guskey, 2002).

Methodology

A mixed methods design was used and data were collected through a questionnaire with 200 teachers. We used a convergent mixed methods design (Cresëll & Plano Clark, 2018) to investigate how teachers view the quality of training so far. The collected data were processed and evaluated. From the data it was seen what were the defects of the training so far. Out of 200 teachers who filled out the questionnaire, 25 were men and 175 were women. The teachers who filled out the questionnaire were from the whole district of Gjirokastër (Memaliaj, Tepelënë, Përmet, Gjirokastër, Libohovë, Këlcyre). Referring to the profile, 50 were from Preschool Education, 100 from Primary Education and 50 from Lower Secondary Education.

Discussion

The teachers came from different qualifications in years as can be seen in the graph below. Almost all teachers participate in the qualifications, regardless of seniority. This is even though the law obliges them to receive credit points every year. From the graph, we see that there are participants in the trainings from all categories, but Master teachers occupy 43% of the qualification categories that participate in the trainings. This is due to the fact that they make up the majority of the number of teachers.



Graph 1. Categories describing teacher qualification.

All teachers consider training important but also effective in their professionalism as well as in the transfer of knowledge to students. There are also teachers who call them somewhat important, but these are the Master teachers. 73% of teachers call the training effective and only 27% call it somewhat effective, this category belongs to Master teachers who are close to retirement.

Graph 1. How effective do you consider the trainings?

Regarding the training service provider, it can be seen that the teachers call the trainings offered by universities more effective compared to private centers. Teachers also selected the knowledge they receive from professional networks and subject teams.

52% of teachers call effective training from universities, 10% from private centers, 6% from various licensed NGOs, 17% from subject teams and 15% from professional networks.

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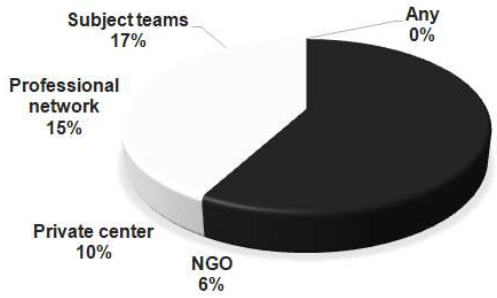
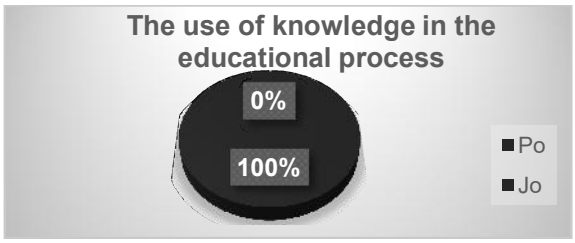


Graph 3. The most effective training providers

The knowledge gained from the trainings 100% of teachers admit that they use them in class.

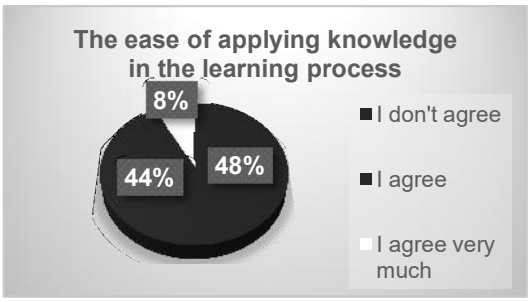


Graph 4. Use of knowledge by teachers in the learning process.

In terms of training platforms, teachers develop more the direct one where more knowledge is gained with 52%, but there are also those who require combined platforms.

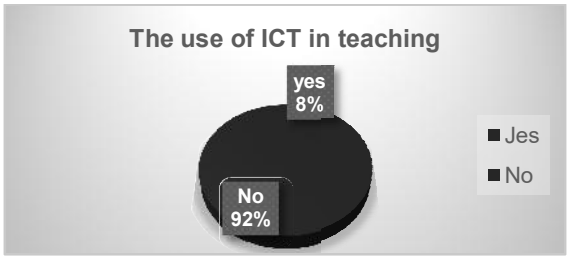
Graph 5. The most effective training platform

Regarding the implementation of knowledge in the lesson, not all teachers use the training received because often there is a lack of infrastructure, especially for the use of Information Technology and various digital platforms. 48% do not agree that all the knowledge obtained from the trainings is implemented in the classroom.



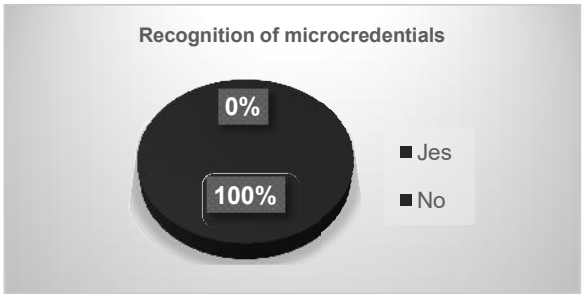
Graph 6. Application of knowledge acquired in class

Regarding the use of ICT in the teaching process, the teachers answer that they cannot implement it because there are no ICT standards in teaching. Even the teachers did not know the ICT standards for students, teachers and principals at all.



Graph 7. Use of ICT in the teaching process

Teachers are not yet familiar with the term microcredential. From the questionnaire it turned out that they did not know them at all.



Graph 8. Knowledge on microcredentials

During the trainings, problems were identified by the teachers and pedagogues, which consist of:

1. Lack of infrastructure for the use of ICT and interactive platforms.
2. In rural areas, the economic conditions are not conducive to the use of ICT.
3. The administrative overload of teachers does not allow them to pay due attention to the teaching process.

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4. Revision of textbooks and subject curricula.
5. Help that should be given to teachers with ready-made pre-prepared materials that belong to the current curriculum.
6. Giving professional freedom in the organization of the lesson.
7. Increasing teacher training days.
8. Priority in providing training services for teachers should be Universities.

Many teachers report that current professional development offerings are neither relevant nor effective. The question arises: How can teachers prepare themselves to face the various challenges in today's schools? The OECD Teaching and Learning International Survey (TALIS) helps to answer this question by asking teachers and school leaders about their working conditions and learning environments in their schools. The Ministry of Education and Sports, as it prioritizes the continuing professional growth of teachers and in accordance with the Pre-University Education Law No. 69/2012 amended and in support of the career framework for the teaching profession, has developed the national framework of microcredentials which is also based on the official Guidelines. Unlike traditional training, microcredentials are small-sized competency-based recognitions. The teacher receives specific and actionable skills that he can immediately apply in his work. Microcredentials can address specific training needs.

Microcredentials are new to the professional development of educators, and they provide teachers with opportunities for self-directed, hands-on learning experiences that will be implemented in the classroom. Microcredentialing grew out of the digital badge movement—a technology-driven approach aimed at improving the learning of adults within the workforce (De Monte, 2017)

Recommendations

1. To familiarize teachers with microcredential terminology.
2. To enable teachers to identify themselves the microcredential that is necessary to increase their professionalism.
3. To provide training for micro-credentials at universities.

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The importance of teacher training in increasing the quality of education, an in-depth analysis

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Abstract

The teaching profession has a special importance in society. Almost all children take their teacher as an example because he has an important role in their life and they see him not only as a teacher but also as a second parent. Teaching is not only a profession, it is also an opportunity to serve others by influencing the shaping of an entire society. However, a profession through which you influence the shaping of other minds, it should be known that it is a profession with many responsibilities. Teaching offers the opportunity to change other people's lives for the better. As a teacher you can help develop someone's knowledge, perhaps even influence their mind and personality.
But to be a good teacher, you must be a good student. The professional and scientific preparation of a teacher does not end with receiving a diploma or a license from him, but is a long process that accompanies him throughout his life, responding to the dynamism of work, which changes and evolves day by day, making the teaching profession a road ëhere you cannot step on the same path twice.
Therefore, in order to respond to this dynamism, it is necessary for the teacher to be trained from time to time in relation to teaching innovations.
The form of teacher training should be flexible and effective, because only in this way will it be possible to make the teacher suitable with the new teaching methods.
We are often taught that the teacher is trained through routine training, which in many cases is done to fulfill the legal obligation of credits, without taking away from the training its importance. This is an incorrect approach, as training should be as effective and practical as possible.
In this paper, we have made a reflection of the context of education in Albania, how it has changed with the change of years and what new things have been added to the teacher training system.
Being in full compliance with the laws and guidelines for teacher training in the Republic of Albania, we have tried to give some ideas, strategies and efficient methods on how the teacher can be as prepared as possible to appear in front of his students.

Keywords: teachers, training, credits, professional development, etc.

Introduction

The first part provides a comprehensive overview of the content of the article "The Importance of Teacher Training in Enhancing the Quality of Education: An In-Depth Analysis". It begins with an introduction to set the stage for the discussion, followed by an exploration of the general context of education in Albania. It then highlights the importance of qualifications and professionalism among teachers, leading to a review of academic training and its role in the field of education.
Next, the section discusses relevant studies and research on teacher training, as well as current policies and practices related to this topic. It also addresses the potential changes and effects on the education system resulting from the use of teacher training. Finally, it concludes with recommendations and next steps to be taken to improve the quality of education through the implementation of teacher training. The content of this section aims to provide a coherent and detailed overview of the article, focusing on the main ideas and themes that will be explored throughout the analysis.
The introduction section serves as a gateway to explore the importance of teacher training in enhancing the quality of education. In this section, we will provide a summary of the key concepts and themes that will be explored throughout the article. Our aim is to draw attention to the importance of professional development for teachers and the role that training plays in this process. By highlighting the context and relevance of this topic, we aim to set the stage for a comprehensive analysis of the current state and potential impact of teacher training systems in the Albanian education system. Through this introduction, we hope to engage our readers and convey the critical nature of this paper in improving the overall quality of education. In the introduction, we will delve into the background and rationale for the need for a comprehensive examination of the teacher training system. We will set the tone for an in-depth exploration of teacher qualifications and professionalism and how the training system intersects with these aspects. By presenting a compelling argument for the importance of this topic, we aim to lay the groundwork for the following sections that will delve deeper into the various aspects of this complex issue. Through an engaging and persuasive approach, we will attempt to effectively communicate the importance of understanding the current state and potential implications of the teacher training system in the Albanian educational context.
Educational policies play a very important role in defining national ideology, identity formation, and notions of citizenship. Consequently, efforts to "reform

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the education system" must be based on a range of values and attitudes, declared or undeclared, which lead to a significant improvement in the learning process in general and in student achievement in particular. Therefore, in addition to importing practices for reworking curricula, assessment methods and forms of community involvement and engagement, teachers must engage in national and international academic training in order to have the appropriate professional preparation to face any challenge in the learning process.

The general context of education in Albania

Education systems reflect the basic organization of a society and its most fundamental values. Albania is going through a period of deep crisis and this is reflected in almost every aspect of the education system. The ongoing political instability and dysfunctional state institutions, the impact of political and economic crises on local struggles for power and economic benefits; the wide gap in opportunities between urban and rural communities; the impact of drug trafficking and organized crime have greatly influenced people's attitudes and expectations towards education, as well as the daily functioning of the education system. In some areas of Albania, the lack of continued security has further strengthened the role of large families, particularly in the north-eastern areas, to compensate for the poor or weak functioning of state institutions.

That said, teaching is very useful, and good teachers are needed in every country. However, teaching others can be tiring, stressful and demanding, and the teaching profession also carries great responsibilities. People's mindsets and motivations vary greatly, so a good teacher must find innovative ways or methods to connect with their students. A good teacher recognizes the needs of each of their students, and uses different approaches with each of them.

If you enjoy working with children and believe that education has the power to change lives, then a career as a teacher may be right for you. In exploring the overall context of education in Albania, it is essential to consider the various factors that contribute to the quality and effectiveness of the education system. This includes examining the historical, cultural and socio-economic influences that shape the educational landscape in the country. By understanding the broader context in which education operates, we can better understand the challenges and opportunities that exist within the Albanian education system.

The overall context of education in Albania is influenced by a complex combination of historical, cultural and socio-economic factors. The country's turbulent history, including periods of occupation and political instability, has had a significant impact on the development of its education system. Furthermore, Albania's transition to a market economy in the 1990s brought changes to the education sector, leading to both opportunities and challenges. In this context, it is essential to examine the current state of education in Albania and identify areas for improvement in order to enhance the overall quality and effectiveness of the education system. By considering the broader context of education in Albania, we can gain valuable insights into the complexities and nuances that shape the country's approach to education, paving the way for informed and effective interventions to promote the overall quality of education.

Academic training and professionalism in education

The importance of teacher qualifications and professionalism is paramount in improving the quality of education. Teachers play a crucial role in shaping the future of our society, and the level of their qualifications and professionalism directly impacts the effectiveness of the educational process. Highly qualified and professional teachers possess the knowledge, skills, and expertise needed to effectively deliver the curriculum, engage with students, and create a stimulating learning environment.

Teacher professionalism influences the overall perception of the teaching profession and enhances the prestige and respect it commands in society. When teachers are highly qualified and professional, they serve as role models for their students, inspiring them to strive for excellence in their academic and personal development. Professional and qualified teachers are better equipped to adapt to the ever-changing demands of the educational landscape, integrating new pedagogical approaches and technologies to enhance the learning experience for their students.

Investing in teacher qualifications and professionalism is not only essential for the individual development of educators, but also for the overall advancement of the education system as a whole. By continuously improving our teaching methods, we can directly influence the quality of teaching in the classroom. The way we teach directly affects the way our students learn, absorb information, and apply their knowledge.

Therefore, it is essential that teachers continually seek and implement effective pedagogical strategies that will engage students. Furthermore, the quality of teaching has a direct correlation with student success. When teachers use effective pedagogical methods, they create a more stimulating and supportive learning environment. This, in turn, leads to increased motivation, improved information retention, and better academic outcomes for students. Improving pedagogical methods can also lead to more efficient use of teaching time and resources, as well as a more

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personalized and adaptive approach to teaching that addresses the diverse needs of students.

By recognizing the importance of improving pedagogical methods, teachers can harness the power to positively impact their students' learning experiences and outcomes. It is imperative that teachers seek out and continually engage in the training and professional development necessary to improve their pedagogical skills, as this will ultimately lead to a more satisfying teaching experience.

It is essential to recognize that the methods used by teachers have a direct impact on the effectiveness of the learning process. By using innovative and effective pedagogical methods, educators can create a more engaging and interactive learning environment, thereby increasing the overall quality of education. These methods play a key role in shaping the learning experience, as they determine the level of engagement, and understanding of students. Furthermore, the use of effective pedagogical methods can contribute to the development of critical thinking skills, problem-solving skills, and creativity in students.

Therefore, it is imperative for educators to continuously improve their methods to raise the quality of teaching and learning. By using diverse and interactive teaching strategies, teachers can cater to the individual learning needs of students, making the learning experience more inclusive and effective. Furthermore, the use of modern pedagogical approaches can stimulate students' interest and motivation, leading to improved academic performance and enthusiasm for learning. Therefore, improving pedagogical methods through involvement in training is essential for creating a dynamic and rich learning environment that fosters the holistic development of students. Ultimately, by recognizing the impact of pedagogical methods on the quality of teaching and learning, educators can better appreciate the need for continuous improvement and innovation in their teaching practices.

In the context of teachers' academic and professional development, the issue of academic training and its impact on the field of education is of great importance. Academic training serves as a fundamental tool in promoting the professionalization of teaching, as it recognizes and rewards teachers' continuous professional development and educational achievements. Understanding the importance of training in education is essential in enhancing the quality of teaching and learning, as it encourages teachers to engage in lifelong learning and pursue further qualifications and expertise in their respective fields.

Furthermore, academic training plays a crucial role in promoting the professionalization of teaching by establishing a standard framework for recognizing the skills, competencies and achievements of educators. They provide a systematic approach to assessing and recognizing teachers' professional growth and expertise, thus contributing to the advancement of the teaching profession. Furthermore, the implementation of academic accreditations in the field of education fosters a culture of continuous improvement and excellence, as it encourages teachers to engage in continuous professional development activities and pursue advanced qualifications to improve their teaching, practices and pedagogical skills.

Overall, the integration of academic training in the field of education is instrumental in promoting the professionalization of teaching, as it recognizes and promotes the continuous professional development of teachers and contributes to the advancement of the teaching profession. By understanding the importance of academic training in education, policymakers and stakeholders can foster a culture of lifelong learning and continuous improvement, ultimately leading to increased quality of teaching and learning in educational institutions.

Studies and analyses related to teacher training

The section Studies and analyses related to user training delves into extensive research and studies related to teacher training in the context of improving the quality of education. Numerous studies have been conducted to explore the impact of training on teacher professionalism and qualifications, as well as their effectiveness in improving the overall education system. These studies provide valuable insights into the relationship between teacher training and improving the quality of teaching, student outcomes and professional development.

These studies also shed light on best practices and policies regarding the implementation of teacher training, providing valuable recommendations for future improvements. By analyzing these studies, we gain a deeper understanding of the role of training in shaping the educational landscape and the potential effects on teacher motivation, retention and career advancement. Furthermore, these findings provide a basis for developing informed policies and effective strategies to further raise the standard of education through the use of teacher training. The section on studies and analyses related to teacher training presents a comprehensive overview of existing knowledge, as well as implications for the continuous improvement of the education system and the professional growth of teachers.

Current policies and practices regarding teacher training

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In the current educational context in Albania, policies and practices related to teacher training are of great importance in shaping the quality of education. Current policies and practices related to teacher training are designed to promote continuous professional development, to support the improvement of the quality of teaching and to improve the overall education system.

These policies aim to provide teachers with opportunities to obtain and accumulate credits through various forms of professional development activities, including seminars, training programs and higher education courses. Current practices emphasize the importance of monitoring and evaluating the effectiveness of these credit-earning activities in terms of improving teaching practices and student learning outcomes.

Furthermore, existing policies also address the issue of recognition and transfer of training, ensuring that credits earned by teachers are properly recognized and can be transferred between different educational institutions or programs. This is essential in promoting a cohesive and comprehensive professional development framework for teachers. Furthermore, current policies also emphasize the importance of aligning credit-earning activities with national educational priorities and goals, ensuring that teacher professional development efforts contribute to the overall improvement of the education system. Ultimately, current policies and practices regarding teacher training play an important role in shaping the professional growth and effectiveness of educators, thus influencing the quality of education in Albania.

Changes and new effects of the education system from the user of teacher training.

Teacher training can bring about significant changes and potential impacts in the education system. By introducing a teacher credit system, there is an opportunity to improve the overall quality of education by ensuring that teachers receive ongoing professional development and training. This can lead to a more knowledgeable and skilled teaching force, ultimately benefiting students and the quality of the education they receive.

Furthermore, implementing a teacher credit system can also lead to a more standardized and regulated approach to teacher qualification and professional development. This can help ensure that all teachers have access to the same opportunities for growth and improvement, thus creating a more equitable educational environment. Furthermore, the use of teacher training can stimulate continuous learning and professional development, as teachers work towards accumulating training to advance their careers.

However, it is important to consider the challenges and potential drawbacks of implementing a teacher credit system. This includes the need for sufficient resources and support to ensure that teachers have access to relevant and high-quality professional development opportunities. Furthermore, there may be concerns about the potential for increased workload and stress on teachers as they attempt to meet credit requirements. Overall, while the use of teacher training has the potential to bring about positive change in the education system, it is essential to carefully consider and address the potential impacts and challenges that may arise.

Recommendations and next steps

In conclusion, the analysis of the importance of teacher training in improving the quality of education has led to several key recommendations and next steps. First, it is essential to continue investing in the qualifications and professionalism of teachers, as they play a fundamental role in the development of the education system. This includes providing opportunities for continuous professional development and supporting teachers in receiving the necessary academic training.

Furthermore, it is essential to regularly review and update policies and practices related to teacher training to ensure that they are in line with the current needs and challenges of the education system. This could include reviewing the criteria for undertaking training, exploring alternative methods for accrediting teacher professional development, and promoting a more holistic approach to assessing the impact of training on teacher performance and student outcomes.

Furthermore, collaboration between educational institutions, policymakers and stakeholders is essential to ensure the effective implementation of teacher training systems. Working together, they can share best practices, address potential barriers and create a supportive environment that encourages teachers to pursue further qualifications and professional development.

Overall, the next steps should focus on fostering a culture of lifelong learning for teachers, increasing the relevance and effectiveness of training systems and ultimately on raising the quality of education in Albania. It is through these concerted efforts that we can make important strides in the continuous improvement of the education system and the professional growth of teachers.

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Professionaldevelopment of teachers: The Most successful practices``

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Abstract

The professional development of teachers is an essential component for improving the quality of education in any educational system. This article examines the most successful practices of professional development for teachers, focusing on methods and strategies that have shown positive results in improving teaching performance and student engagement. A strong approach in this field is necessary to ensure successful and sustainable education**.** In addition to identifying effective strategies, this article explores common challenges and offers recommendations for overcoming them, thus creating a supportive framework for teacher growth.

Keywords: professional development, curriculum, training, mentoring, technology integration, teacher assessment

Introduction

The professional development of teachers is an ongoing process that not only enhances their instructional skills but also enriches student outcomes. This development is essential in today's educational landscape, where technological advances and evolving pedagogical methods demand continual learning.

Teachers who participate in regular development opportunities can adopt innovative methods, such as differentiated instruction and active learning strategies, thus creating a dynamic learning environment. Further, professional development supports teachers in adapting to labor market changes, empowering them with the skills needed to meet new demands in teaching.

The most successful practices in professional development encompass frequent and differentiated training sessions, practical approaches through simulations, and the use of mentoring and collaboration. Each of these elements supports teachers in continuously enhancing their effectiveness in the classroom.

Methodology

This study employs a qualitative research methodology to explore the most effective practices and challenges in teacher professional development. By using in-depth interviews, focus groups, and classroom observations, the methodology aims to gain a comprehensive understanding of the current practices in professional development and their impact on teacher performance.

In-Depth interviews

Interviews were conducted with a diverse group of teachers from various educational levels and backgrounds. These interviews allowed for a detailed examination of teachers' personal experiences, perceptions, and needs related to professional development. By focusing on individual experiences, the study was able to capture unique insights and identify recurring themes regarding the factors that either support or hinder professional growth. Questions in the interviews centered around training access, the relevance of content, and how well current practices align with their professional needs.

Focus groups

Focus groups provided a collaborative space for teachers to discuss their professional development experiences and share best practices. This approach fostered a collective dialogue where participants could discuss challenges openly and exchange ideas on how professional development can be improved. Conducted in groups of five to eight participants, the focus groups offered a unique perspective by highlighting shared challenges and the types of support teachers find most beneficial. This approach also helped identify the degree of mentorship and collaboration occurring within schools and how it influences teacher satisfaction and effectiveness.

Classroom observations

Classroom observations were conducted to assess how professional development training translates into practice. Observations focused on specific behaviors such as instructional techniques, student engagement strategies, and classroom management. These observations provided an objective assessment of whether the professional development training teachers received had a tangible impact on their teaching methods. Furthermore, observations highlighted the areas where additional training could benefit teachers,

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allowing for a better understanding of the gap between theory and practice.

Data analysis

Data from the interviews, focus groups, and observations were analyzed using thematic analysis. Common themes were identified, such as the need for tailored training, the importance of mentorship, and the benefits of integrating technology in professional development. By categorizing responses, the study could compare perspectives across different educational levels and regions, providing a comprehensive overview of both successful practices and areas needing improvement.

Reliability and validity

To ensure reliability, the study used a standardized set of questions in the interviews and focus groups. Additionally, a second researcher cross-checked the data to minimize bias and ensure the consistency of findings. Validity was strengthened by triangulating data from multiple sources—individual interviews, group discussions, and classroom observations—thereby providing a well-rounded understanding of teacher professional development.

Successful practices in professional development

Frequent and differentiated training. Differentiated training enables teachers to choose from a range of topics, such as pedagogy, classroom management, and technology use, ensuring that each educator can focus on areas relevant to their own needs. Studies show that targeted, frequent training significantly improves teacher competency, and in turn, positively impacts student engagement and learning outcomes.
A notable example is Finland's education system, where teachers engage in regular, research-based professional development activities. Finnish teachers collaborate frequently, reflecting on their practice, which helps them apply theories effectively in diverse classroom settings. This model of continual, reflective training has become a global benchmark in teacher development.

Practical approaches and simulations. Practical training techniques, including simulations and case studies, allow teachers to practice and refine their skills in real-world scenarios. This hands-on approach facilitates a deeper understanding of teaching methodologies and enhances teachers' confidence in implementing them.
For instance, Singapore utilizes simulation-based training extensively. Teachers are provided with hypothetical classroom situations in which they must apply specific techniques. Such experiences have been shown to improve classroom management and instructional delivery.

Mentoring and collaboration. Mentorship is invaluable in the professional development of teachers. Experienced teachers, acting as mentors, provide insights and guidance to less experienced colleagues, fostering a culture of knowledge sharing. Collaborative professional networks and peer observations offer teachers the opportunity to share best practices and discuss challenges in a supportive environment.
In the U.S., many schools have implemented Professional Learning Communities (PLCs), which encourage teacher collaboration and collective problem-solving. PLCs have been instrumental in creating a continuous feedback loop for teachers, supporting them in their efforts to adopt new strategies and improve their instructional techniques.

Use of technology. Technology has transformed professional development by offering access to online training modules, virtual workshops, and collaborative platforms. Teachers can engage in professional learning from any location, making training accessible to those in remote or rural areas. Moreover, technology fosters communities of practice, where teachers can exchange ideas and resources with their peers globally.
For example, platforms like Edmodo and Google Classroom enable teachers to join groups, share resources, and attend webinars. This connectivity broadens their understanding of global educational trends and best practices, allowing them to adapt their teaching styles accordingly.

Assessment and reflection. Ongoing assessment and self-reflection are essential components of effective professional development. Schools that incorporate regular evaluations help teachers identify their strengths and areas for growth. Personal reflection enables teachers to think critically about their teaching methods and the impact on students, fostering a growth mindset.
In Canada, for example, schools integrate annual performance assessments as part of a professional development plan. Teachers are encouraged to self-reflect and discuss these evaluations with mentors, facilitating continuous improvement. Such practices ensure that professional development is not a static process but an evolving journey aligned with the teacher's goals and the school's mission.

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Integrated curriculum. An integrated curriculum that includes professional development as a formal component of a teacher's role can further reinforce growth. Teachers who participate in professional development as part of their curriculum delivery are better prepared to adapt to curriculum changes and align their teaching with broader educational goals.

Methodology

This study employs qualitative methods, including interviews, focus groups, and classroom observations. Interviews with numerous teachers provided insight into their needs and experiences regarding professional development. Focus groups allowed for in-depth discussions about the challenges teachers face and the types of support they require. Observations focused on how professional development impacts classroom dynamics and student engagement.

Results and discussion

Professional development practices have demonstrated numerous benefits, yet challenges remain. The results show that successful practices improve teaching quality, but barriers such as limited resources and restrictive work cultures hinder development. Teachers in rural areas, in particular, face unique challenges related to accessibility and often lack the resources necessary for effective professional growth. Additionally, in schools where innovation is not encouraged, teachers may hesitate to engage in professional development.

The data indicates that professional development fosters a culture of learning among teachers, allowing them to be more adaptable, confident, and effective in their roles. However, overcoming the noted barriers is crucial for a more comprehensive impact on the educational system.

Recommendations for improvement

Investment in infrastructure: Governments and educational institutions should allocate funds specifically for teacher training, ensuring that all teachers have access to high-quality professional development opportunities.

Encouraging a culture of innovation: Schools should cultivate an environment that supports experimentation and the implementation of new ideas, creating a safe space for teachers to apply what they learn.

Developing clear policies: Education policy should establish clear guidelines that guarantee equitable access to professional development for all teachers. This includes offering grants or incentives for teachers in remote areas.

Promoting online platforms: Leveraging online platforms can help bridge the gap for teachers in underserved areas by offering virtual training and resources.

Conclusion

The professional development of teachers is a complex but essential process for achieving positive outcomes in education. Successful practices, such as frequent training, mentoring, and the use of technology, provide valuable opportunities for teacher growth and improved student performance. By investing in infrastructure, fostering an innovative culture, and creating inclusive policies, educational systems can enhance teacher development. This, in turn, represents an investment in the future of education and a critical step toward building a more educated society.

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The professional development of the teacher is a challenge of today and the future

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Abstract

Education as one of the main pillars of the growth, development, success and representation of a nation, regardless of the geographical position or economic development, is in constant challenge with time for the growth and strengthening of the human and infrastructural potential. Today more than ever, teachers must be engaged in continuous research, for the discovery, absorption and implementation of new information or advancements in the field of teaching, professional ethics, and the use of effective strategies. As educatorsof the new generation, the need for their further professional development as well as the need to improve their educational environment is an ongoing task of today and the future. Qualifications, training programs that provide specific knowledge, the ability to meet the personal, social, cultural needs of the individual, or market requirements are a necessity for professional growth, access to the labor market, and adaptation to European experiences.The purpose of this study is related to the role played by training, long-term or short-term qualifications, both within the school and by accredited agencies, in improving the quality of teaching, changing the worldview in human relations, developing interactive, fun learning, as well as the use of technology, where the main role is played by respecting the student's opinion with the vision that time requires.

Keywords: teacher, training, qualification, professional development, education

Introduction

New developments and discoveries in various fields of science require changes in the worldview and approach of our educational level with European experiences. Teachers must be in constant change professional preparation, career development, completion of personal portfolio, development and implementation competencies. The main role is played by trainings, qualifications and certificates with credits that they earn in their development.

"Training" means carrying out systematic exercises of a certain duration that serve to create an optimal physical, mental and psychological state. On-the-job training is a short but intensive systematic exercise that takes place in the workplace under the guidance of a guide [1]. Furthermore,teacher training in the subject that teaches, as well as in pedagogy, contributes positively to educational outcomes, and tests that assess teachers' verbal skills are associated with higher levels of student achievement [2].

The use of new terms in teaching, especially technological ones, such as the application of the microbit for the discovery and construction of individual projects by students in the learning process, which in the first grade requires a serious commitment and dedication on the part of the teachers. This dedication of theirs will translate into the development of more trainings, qualifications, earning credits in the relevant fields.A study funded by the Department for Education and Employment (DFEE) emphasized that todayteachers face a climate of constant change in teaching to adapt it, both to environmental needs and distance learning[3].The component indicators of the teacher's qualification, such as: the type of diploma, the university attended, the results in the license test and the years of experience are an overview of the professional preparation which is in continuous development and improvement.

"High-quality teacher education is essential for the quality of the system's products and for an advanced and attractive status of the teaching profession itself" [4].The importance lies in the fact of increasing the quality of teacher's work through continuous qualifications and the application of the experiences gained in these qualifications in school settings, as well how much support teachers find in their schools from the leaders to implement the knowledge they gain. The school principal not only maintains the school's activities but is also

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primarily responsible for the development of teachers' careers. Unfortunately, teacher evaluation is often not seen as a tool for growth and development, but as a formality that must remain. When evaluators treat evaluation as a mechanical, bureaucratic exercise, and teachers see it as an event that must stand, evaluation becomes little more than a time-consuming ritual. The crucial importance in the systematization of teacher evaluation is its connection with development and professional improvement, which affects the quality of teaching in learning and achievement.[5] in distinguishing between teaching quality and teacher quality, suggested "teaching quality is partly a function of teaching quality, teacher knowledge, skills and dispositions, but is also strongly influenced by the context of learning."The support that must be given to teachers is essential for the success of schools, the progress of students as well as their professional development. Many resources are needed to help teachers in their professional growth.It is clear that teacher quality has a complex construction and is almost impossible to measure it either accurately or entirely[6]. Rice states that: *"Teacher training in the subject that teaches, as well as in pedagogy, contributes positively to the results of education. Tests that verify the verbal skills of teachers are associated with higher levels of student achievement."* (Rice, 2003). One of the main documents related to the level of teacher education, called "Common European Principles for Competences and Qualifications of Teachers" defines the teaching profession as a "profession with genuine qualification, a profession placed within the context of learning throughout life, a model profession and a profession supported by numerous partnerships (Commission of European Communities, 2005).
Teacher professional development programs are a good way for teachers to grow professionally on the job. Also, they have a positive impact on teachers' commitment to work.

2. Training and its positive effects

In the study, we analyzed the role played by the training developed for AMU - AML teachers in the city of Saranda on the topic: " Improving the quality of the teaching process with a focus on the development of reading skills" by the Education Quality Assurance Agency Pre-University. Information about the study group and place of training is given in Table 1.

Tab. 1.Study sample

Group	Place of training	Participants	Female
1	Saranda	22	22

The methods implemented in this study are a combination of quantitative and qualitative methods. Research methods and techniques have been applied, as well as observations in the training-qualification process within schools. For the collection of quantitative data, a structured survey with 60 questions was drawn up, which included negative and positive statements. The population of this study consists of teachers of primary and lower secondary education in the city of Saranda. The sample consists of all teachers of 9-year schools in the city of Saranda. at both levels in the language-literature subject.
Resource materials used include training materials, worksheets...etc. For the theoretical side, the materials prepared by the Pre-University Education Insurance Agency were used, while worksheets were used for the practical activities. The theoretical and practical sessions are given in Table 2.

Theoretical session (4)	**Practice session (2)**
Session 1 : Reading and its importance. Readers in the Digital Age.	**Session 5** : Model questions that develop reading skills.
Session2: Reading processes and skills.	**Session 6**: Designing questions that develop reading skills.
Session 3: Texts and their types.	
Session 4: Types of questions, levels of questions.	

Study results

In the developed training, it was noticed that teachers need to improve their skills in knowing and using

technology in their profession, as well as highlighting the innovations brought about by the use of technology in the reading process, the types of texts that are read. it is related not only to the

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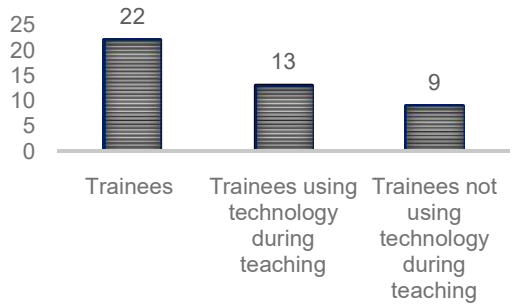
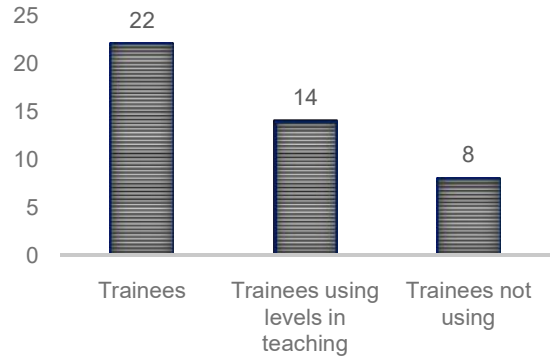
age factor, but also to their lack of access to new developments in the field of technology, the lack of material base. The laboratories in most schools are not used by teachers regardless of the type of subjects they teach. They justify this with the fact that labs should be used more by IT teachers.
The teachers logically argued why students should read, understand, analyze and evaluate texts of different types, but a considerable part of them should build and use the most efficient strategies to improve the reading and understanding of texts by students. In the training, it was also evident that there is a need to improve the drafting of questions by teachers, the types of questions for the development of students' thinking levels.



Tab.1.

The first table shows an unsatisfactory number of teachers who do not use technology in the teaching process, as well as the training and credentials acquired in this field, are an important step for their professional development, a challenge for the future.
This fact was also evident in the observations and surveys conductes with different groups of teachers.



Tab. 2.

The majority of trained teachers, as well as the data collected from observations and surveys, provide a complete overview of interventions for the use of different strategies in the teaching process. Not all teachers use diverse teaching strategies to make the lesson as interesting as possible. and attractive to students.

Conclusions

In the developed training, the positive role of the evaluation and importance of reading in school and in life, for a healthy social-emotional well-being, intellectual development, creation of partnerships in different areas of life was reinforced. Evidence of the innovations that technology has brought to the reading process and the types of texts that are read is a positive step, in terms of the teacher's professional development. The teachers argued why students should read, understand, analyze and evaluate different types of texts, thus developing observational, cognitive, discovery, entertaining skills. Determining the types of questions, levels and skills that evaluate and develop questions that are built on texts of different, are the main priority in the absorption of new knowledge. Assessing the importance of the teacher's questions in the development of high levels of thinking as well as effective learning are the main pillars in the performance of each teacher. Since this module had its starting point from the results of PISA 2022, familiarizing the teachers with test models and international testing requirements, we think was the best practice.
Earning the credits earned in each short-term training has positive effects in terms of professional development, as well as the identification of those strategies or areas of teaching in which teachers show deficiencies and insecurities.

Recommendations from the training

First, these trainings should not include AMU and AML teachers at the same time, since they do not have the same level of information on different issues. From the methodological and didactic side, they use the same concepts, but we noticed that they did not have the same knowledge about the types of texts and their features.
The AMU curriculum should be adapted to the content of these modules, because it helpsteachers in their daily teaching and students get used to new reading practices.
Teachers who cover library hours in schools should be trained more, not only to overcome reading challenges, but to develop more activities where digital devices can be used for reading for different purposes.

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Teachers must have knowledge of the inclusion of information technology in the realization of the goals of the module. It was not easy for all the teachers to be easily involved in the use of technology, although the desire was not lacking.
Enriching the personal file with credentials acquired in the trainings related to the recognition and application of technology in various fields of teaching is the need of the hour, so it should be given primary importance today and in the future**.**
Techers must be trained in a continuous way through both online and hands-on courses for further professional development.

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Micro-credentials: Competence and Performance in the Albanian school in today's global context.

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Abstract

We find the formulation on competence and performance to appear as a given from the modern language that starts with F. Saussure, as a distinction between language and speech and that continues with N. Chomsky who is the first to formulate them theoretically: competence and performance. Saussure defined the double relation of the linguistic sign (speech): the relation of words and concept and the concept of arbitrariness between words and objects. Meanwhile, Chomsky finds language in its two dimensions: as a universal language as a historical language: the first born with man in the form of universal grammar and the second as a concrete language in its entirety of words and rules, where other words like syntactic unit within the sentence, which makes the connection between the order of things in reality and the order of concepts in reason. As Descartes surprisingly considered language improvised, M. Foucault also sees it as a discourse where language-speech-communication perform simultaneously, even seeing this linguistic interpretation in the services of power. The acceptance of many families with the concepts of performance-competency and performative teaching through the establishment of the curriculum with competencies.

Key words: Modern linguistics, knowledge, competence, performance, Micro-credentials, ideological and social dispositives.

Introduction

Competence and Performance: The curriculum with competences is approaching a decade that seeks to be implemented in the Albanian school. We ask, because in our judgment it has not reached its own data, because it has been in the state of knowing their performance and competence, the differences and differences between them, as well as the ideological-social dispositions in those that can be found. Micro-credentials naturally flow from them, as a need to give up imagination and make room for knowledge as a model of culture. And its own natural and material culture affects all dimensions of being, and ideals, internal and external. Here there is no counterpart to the conception of self-awareness in Hegel, where transcendence is the basic act of his thought to make consciousness and knowledge. Simplifying without Hegel's thought, we can say that he mannerizes as well as Kant (actually himself as a philosopher) in relation to the degrees of recognition and manifestation of the soul, until the being (self) is identified with the divine being; and in relation to society, culture and historical stages, where self-transcendence culminates in its union with the absolute state. Thus proving once again the dialectic between internal and external which are in our terminology in the lessons as competent knowledge and performative knowledge.

Then, without wasting time let's define knowledge, as we have put it above and immediately after that define the nature of competence and performance. Knowledge is

finding the intentionality of the existence of things (organization of concepts) and their way of functioning (concepts) not in the interrupted circumstance in time and space, but as a possibility of contact with the whole world as a whole. And, after this is found and takes the status of knowledge, it is related to the disposition of the identity in providing the stability of the world through its contribution to the reality, the society, the time in which we live. Knowledge, as such, cannot be separated from society, moreover, there can be no life separated from man and the world. Performative knowledge is in action within society in the time and reality we live in and as such can be defined as a knowledge, which in its origin has a necessary connection with the human being to whom it is addressed. Meanwhile, competence, starting from the fact that it is found in a conceptual form in man (as a type/species) and in the way the world functions (so it is doctrinal in nature), we can define it as a knowledge which at first sight seems to have no relationship with the human being to whom it is addressed, but which carries within itself the potential of a necessary relationship with the being to whom it is addressed.

Everything we have argued above is necessary, but not sufficient, because we have not yet presented the provisions of an ideological and social nature. In this presentation of these provisions (as factual data that complicate or facilitate cultural phenomena) we will follow the complementary nature of compensation-performance, along the dichotomy modernism-postmodernism which characterizes the state of human society in general where the concepts were born and developed of competence and performance in general, but also where the Albanian school was born and developed its activity in particular. It is here that we will be

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able to show how micro-credentials take on relevant values, seeing the reality in the classroom or auditorium as a miniature of the external reality, the alternation of the pace of teaching within the lesson with the immediate social changes today, so the classroom or auditorium really is a place where society is turned away, but where society is always talked about. Then let us present the possible dispositions of the ideological-social nature and reveal the corresponding principles with which each of them confronts us. While above we defined competence and performance and once we have found the principles by which they interact with each other in accordance with the ideological and social dispositions, the methods and techniques are there to be used according to each of the perspectives that those dispositions direct us to.

Mass education occurred between the modern and postmodern disposition: the first as the right to be enlightened and the second as the right to be affirmed. Mass education has its origins in the Enlightenment project that proposed as a common solution for all people the enlightenment (enlightenment) of human reason since the political level was transformed into the obligation to massify the school sistem to enlighten the minds of all members of society. This solution proposed by the Enlightenment as the first moment of modernity (followed by positivism and absolutism) was the cultivation of two essential characteristics of knowledge: its human origin and its dialectical-argumentative formatting. While the individual of the end of the 20th century and the beginning of the 21st century is psychologically outside the influence of either dogma (pre-modernity) or argument (modernity) with the conviction that the truth cannot be revealed and everything will depend on pure fate. And this is the cosmology of postmodernism (of consumer society, global, postindustrial: -the time we live in), where the absence/non-appearance of truth causes things not to acquire value for the sake of their relationship with truth, but for the sake of the immediacy of their presence in a world of instant information. Under these conditions, contemporary (postmodern) society does not demonstrate any tendency or aspiration to rely on knowledge in the organization of institutions and the acquisition of mindsets and habits. So, as we said, today's society is completely indisposed to the truth and, as such, the status of people of knowledge (scientists, professors, teachers, doctors, lawyers...) in society is insignificant and insufficient. However, we can formulate the question differently: - Can the school turn society towards knowledge to get to the truth? But we know that the school itself, starting from the paradox suggested by the above dichotomy modernism-postmodernism, is in a state of weakness. But we can formulate the question differently, as a rhetorical question: - Is it not wiser for the school to focus on the fact that people do not deny the need for knowledge, instead of focusing on how most people today see education in its higher pre-university and university levels as a need for status and not for knowledge? Or we can ask another (satisfied) question: Isn't the number of high school graduates and high school graduates who attend our high schools and universities increasing, becoming more and more massive, year after year (assuming that the school is overcoming state of weakness, getting stronger)? In fact, not only the last question, but all the questions above reflect a kind of complacency even though they are all generated and legitimized by the premise of the well-known weakness of the state of knowledge in society.

This state of inadequacy in which people of knowledge find themselves specifically determines the weakness of the albanian school today. It is not an exception, but it is a rule: whoever bears the burden of truth in society (unfortunately when even the elites of this society are false) those few scholars, professors, lawyers, teachers or doctors are characterized by not having the right power to fulfill themselves and to help others, as such conditioned by weakness, but not necessarily by it. But starting from the fact that we can only identify the weakness, we take it for granted. And this has made the school at all its levels seem to demonstrate this structural-total impotence. Weakness is not that it has a material reality, but in fact it is a state of mind, because no one, and certainly not the institutions of knowledge, can be weightless, weak, definitively without its own surrender (without its own consent). It is here that we can highlight a second moment of powerlessness, that is, not only weakness, but also the exposure of the truth at all costs through the knowledge it possesses, as an institution which it represents in society. Therefore, they should conceive of the school (pre-university and university) as one of those who carry the burden to convey the truth in a society where this truth has been lost, there is no other choice, because it cannot give up knowledge and thus not convey the truth. In fact, this inability of knowledge institutions to solve their weak point (or weak points), which causes their impotence, but to precede the danger, they must to avoid weakness through the exposure of knowledge and its tree of truth. The school/university, as one of those who bear the burden to convey knowledge to society, where this has been lost, has no other choice,

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because it cannot give up knowledge and not transmit the truth. If it is submitted to the other alternative of not conveying the truth, according to a widespread mindset to preserve it, to preserve it from being lost over time and generations, as such the school should function as a incubator of knowledge, waiting for better times, social conditions that aim to give shape and meaning to themselves through knowledge. This is untrue that a society, in its inertia, never exhausts the cycle of repeating itself to infinity. And as a result, the school or university student accepts, likes to be weak in a structural-capillary way. When we said that there is no choice for the possessors of knowledge, for the school or university not to possess and transmit knowledge, we meant by this a reasonable (rational) choice in the conditions of the dominance of the irrational (because such is the time when we are living). Because choosing to expose at all costs the truth through knowledge, may place us in a conventional circumstance of weakness, but knowledge and truth through it (knowledge) only in the circumstance interrupted in time and space can be weak, where and implies that it (knowledge/truth) is weightless and unaffected. And within the obligation for reasonableness that originates from the Enlightenment-modern basis of school massification, it makes the minimum have a weak point: that is, the obligation to impart knowledge and transmit the truth at any cost, which it cannot refrain from just in case. As such, the school/university as the main source of knowledge in a society is insufficient in its status and opportunities and, as long as what it has weak points cannot be covered, then since the exposure of truth through knowledge is, as a consequence of inevitably, she/he (school/university) cannot, does not have the luxury, to seek to cover the weak point. The overcoming of the weak point (or more than one, i.e. weak points) can be found in the relevant doctrine of knowledge, which carries the potential to overcome impotence. If it does not make this reasonable act (in the total context of social unconsciousness), the Albanian school or university cannot be the master of knowledge, for which it exists in society and they stamp themselves as weak without return, or, in on the contrary, it conveys the truth and walks on the safe path of the exposure of knowledge. Exactly this exposure of the truth should be the compass of the school/university, since as we affirmed and reaffirmed again and again so far not possessing knowledge, in the worst case from school or when he possesses it (the best case), but does not expose its scientific, doctrinal sources with the conviction that today's society does not care, as long as the power orients it school/university towards that knowledge that directly or indirectly serves him. Given that the school has, precisely, as a mission and function, that the truth through knowledge is present in society, but by not doing this, by not transmitting knowledge, by not bringing out the truth in society, in reality, it makes knowledge institutions ironic, but in fact they should never be like that.

Knowledge designed as contribution and freedom in the modern and knowledge as mental satisfaction and harmony coefficient with the reality that surrounds you in the postmodern. This provision puts our issue in the substantive aspect, where teaching in time has codified the results of learning, once known as objectives. With the introduction of the competency-based teaching curriculum in school, there is an attempt to differentiate them: learning outcomes are no longer simply achievable results (objectives) as a match between learning and psychomotor development, but are related to the competencies of the field. Of course, the design of achievable results (as objectives), based on Bloom's taxonomy, linking learning with psychomotor development, poses as a problem, the disconnection from the subject goal within the lesson, as a kind of automation in determining these results. Curriculum with competences seeks to interrupt this automation, which lays down the need for a new taxonomy between competence and performance, where a formal distinction between them was presented when we defined each one above. Paradoxically, in our school, this kind of difference has not been reflected and we simply have a mechanical displacement of the terms, so we no longer call them objectives, but learning results. Therefore, our effort here will aim to highlight the difference between them and the necessity to finally give up teaching with objectives and focusing on the curriculum with competencies. The exit from the subject goals and the automation that appeared from the learning results (the new name for the objectives) is done by blurring and numbing the discourse throughout the learning process, starting from the fact that this discourse has its own objectives in advance. Such a possibility leads to a spiral, which is mostly subject to a previously inevitable habit: based on Bloom's taxonomy, as soon as the first two levels are defined, in an attempt to fulfill them, from there, at least, they originate and two more, thus making four, and continuing on six levels, which inevitably will have to keep order between them. As long as they are distracting and diverting in the lesson, with all the effort to organize them two by two and in the

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design of three objectives for each lesson. However, the main problem is different: the priorities we derive from the learning process must be self-evident, that is, they are determined first concretely/practically by everyone (such as when we deal with the absurd, referring to the useless work of Sisyphus (sizifit), the priority is to determine the nature of personal benefit, social benefit, as well as how personal and social benefit are related) for each of which there is no need for consultation, taxonomy, consent preliminary decision, because otherwise they are fiction, a useless design that cannot be tested during the lesson. Because any learning outcome (as objectives used to be), starting from the formal aspect of Bloom's taxonomy would be unreliable, because you can never be sure how the progress will be, even for the next lesson , the unexpected and unforeseen situations she faces. Therefore, such learning results lose their substantive aspect, so we have only one alternative: to focus on a goal, on the main issue, already formulated as a result of learning according to the competence of the field. So put in the center the relevant competence of the field you intend to build, which is usually the main issue and therefore self-explanatory. So it is just as important that this competence originates from the reality of the lesson, which necessarily requires the definition of the learning situation, which is an expression of the transposition of the reality
where daily social life is managed in the reality of the learning process in the classroom. By updating the lesson, we have defined as the only way to preserve in the mind and heart the clarity of an undisturbed relationship with subject competence.

Meanwhile, facing not only the reality in the classroom, but through it also the social one (the reality in the classroom is a miniature of the everyday reality) in readiness to intercept how the constantly new situations within the lesson, but also during the learning process in general refer to the subject competencies, being prepared to get the best out of this interference for the benefit of the subject competencies. For the teacher (in high school or university) who feels it is his duty to communicate knowledge, to reveal the truth so that this becomes a matter for the whole society, a matter of mentality, culture, institutions, habits, behaviors and so on, the reality in the classroom or auditorium and the social reality projected by it should serve as a reinforcer and strengthener of the subject and key competencies. The opposite is known, it has the appearance of the mistake so far: the a priori conditioning of the teaching reality by an order of learning results (objectives) without reality, an order that by its nature tends to be automated throughout the learning process, becoming self-sufficient and feeding on itself. As such, it diverts and wastes the efforts made, blocks contact with the subject and key competencies and unwittingly leads to turning your back on the world and society, living the reality in the classroom or auditorium as a reality parallel to the daily and social reality.

Knowledge through the ambition that modern science has to get to the truth and knowledge in postmodernism as an exaltation of teaching. This formal provision concludes everything we have analyzed above in relation to the fact that the school/university must expose knowledge as a witness of the truth in the reality we live in, even with the consideration that this constitutes its weak point, the rational condition that it must fulfill not to fall into irony and lack of sincerity. With the burden of the actualized truth, the school or university must early on master the epistemological weakness of the opponents of knowledge (we take into account the power and the propaganda with which it operates), which allows it to be one step ahead of them in any case, regardless that the government and its propaganda are significantly stronger and inviolable. As the concept with which micro-credentials invite us for an approach within the curriculum with competencies, seeing it closely related to the performance of knowledge as an expression of truth in society. If the school or university gives up on this and falls into the opposite: it settles into the mentality of weakness, it does not expose knowledge (at best it keeps it as in an incubator), it immerses itself in fictional priorities, it does not face the unpredictability in classroom/auditorium, does not improvise according to the rhythm required by the learning process, as well as does not witness an example of improvisation face-to-face with the propagandist elites of power. On the contrary, the school/university must prove the truth, the knowledge that comes from it, it must come out of the rhythm suggested by the power and have the quality of intensity. This word (intensity) which originally indicates acceleration and reinforcement, concentration and continuity (these are only significant elements of the word intensity), but when we transform intensity into a teaching methodological capacity, it means that the school/university through this capacity multiplies own contacts with knowledge, so that teachers and lecturers are able to talk about different views of truth. The change of perspectives of independence must happen in real time, that is, in ongoing interaction, in ongoing confrontation with the specifics of the learning process: so that we do not remain dependent on the rubrics of gradualness, on

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the theoretical taxonomy of learning outcomes . As such, institutions of knowledge advance by unfolding their premises of truth and highlighting their volume, demonstrating to the audience that perspectives of truth are expressions of forms of truth discourse. This causes the discourse of knowledge along the relationship with the audience and through it with society to multiply more and more its contacts with its sources, sublimating more and more its limits, removing the need of human discourse for symmetry and predictability, but always nurturing the need for statehood and finality.

Although at first sight it seems that such intensity in demonstrating the diversity of the forms of truth creates in the classroom or auditorium the impression that the depth of the presentation of truth has been lost, but it is the continuous distribution of techniques throughout the lesson, without when the inspiration is exhausted and the argument does not get stuck: the constant intensity of the discourse within the lesson, which continuously pushes its limits, is proof of the power that the recognition of competences gives as evidence of the depth of the truth that the teacher possesses. In a sense, a deficiency seems to emerge from these characteristics of the demonstration of the perspectives of truth throughout the learning process, which is the finding that paradoxically scientific knowledge, what is known as knowledge in the human and social sciences, turns out to be inconvenient and out of place academic: this knowledge based on study and contemplation is knowledge of certifiable competence and genre boundaries, standard references and protocol of procedures, all present in human and natural sciences in gymnasium and university, with the corresponding hours of the corresponding teacher. For these attributes of knowledge to be fulfilled and to provide the necessary knowledge results, theoretically exceed the time available within a lesson or a curriculum, so free time and empty space are constantly needed. Even if this knowledge arrives, even if it is opposed to the propagandistic knowledge of the power, it (the power) with its gigantic mechanism of knowledge transformation instrumentalizes it, detaching it from the role and service it can give to society for to bring it (society) out of stagnation as a cyclical circle where it remains. Such knowledge will be the next inertia of how knowledge cannot affect everyday life.

Conclusion

Knowledge as the bearer of the truth, so that it is not transferred to the propaganda of the next power, must of course be deep and complete, but this is not certified by any kind of authority, but is manifested by the explanation with which it refutes the theses of the nature of the 'common sense', which students demonstrate, as part of the social reality they belong to. And this is evidenced in the ease of knowledge as a perspective of truth to multiply messages and reveal their irrefutability. It serves as the energy to continuously change the perspective of the presentation of the same truth, aiming as the final goal not at the depth of the corresponding truth of the field, but at its unity. Only in this way, by putting the perspectives of truth at the service, by exalting teaching can it be legitimized as scientific-contemplative knowledge. So changing the perspectives that spring from the truth, presenting the same truth that sublimates the relevant science with every other view that appears and relaxes the antagonism, exalts the teaching and with it the audience, encouraging the student to fulfill his capacity in the extra time and with the right will and to ask the same from the reality of the society in which he already sees himself as a contributor.

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The role of Microcredentials in lifelong learning and workforce development in Montenegro

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Abstract

Microcredentials are becoming an important tool in education today, offering flexible and focused learning opportunities that support lifelong learning and workforce development. As the global job market changes, microcredentials fill the gap between traditional degrees and the specific skills that industries need right now.They provide an efficient way for non-traditional learners, such as working professionals, to quickly gain new skills or improve the ones they already have. In Montenegro, universities and other institutions are starting the see the value of microcredentials in this shifting educational landscape. However, there are still challenges, such as the lack of consistent standards, limited recognition from employers, and issues with digital infrastructure.
This paper looks at how microcredentials can encourage a culture of continuous learning, how they align with EU recommendations and the potential they have to improve Montenegro's workforce adaptability and help diversify the economy. It also considers the necessary steps to overcome the barriers to widespread adoption, like improving regulatory frameworks, and building stronger partnerships between educational instructions and industry. By making microcredentials a key part of lifelong learning, Montenegro can better prepare its workforce for future challenges, boost its competitiveness in the EU job market, and ensure inclusive education for all citizens.

Microcredentialsand importance for lifelong learning

The COVID -19 has transformed the global education landscape. Since the pandemic began in the end of 2019, many higher education institutions have shifted to online platforms as their main method of instruction (Ahmat, Bashir, Razali&Kasolang, 2021).
Microcredentialsrepresent a valuable opportunity to bridge the gap between academic qualifications and the skills demanded by the labor market. They offer facilitate flexible learning and support lifelong learning that is also providing opportunities for non-traditional learners, such as working professional and those that would like to up skill or reskill, to access quality education without significant time and financial commitment associated with traditional degree programs.Professional development courses traditionally focus on brief, standardized workshops that provide general skills or knowledge in a specific area (West & Cheng, 2022). However, with the rise of microcredentials, employees can now engage in self-paced learning programs that are tailored to their specific job responsibility or career goal (Gauthier, 2020). This approach enhances professional development by making it more personalized and applicable to individual career paths.
Microcredentialalso enhance lifelong learning, a core EU objective that is promoting continuous professional developing and it is also supporting Montenegro's efforts to meet EU education and labor market standards.
To fully leverage the potential of microcredentials, higher education institutions should prioritize the developing programs that incorporate microcredential into their curricula. This requires investment in the necessary technological infrastructure, fostering partnerships with the industry leaders, and providing ongoing support for both educators and learners.
In Montenegro educational institutions are increasingly recognizing microcredentials as an alternative to traditional degree programs. This shift has been driven by a number of factors: including the need for flexibility in education, demand for specific skills in the labor market, and the desire for a quality education
Finally, it's important to emphasize that flexible online learning opportunities can significantly enhance access to education, particularly for individuals in rural areas or marginalizes communities with limited access to traditional educational institutions. This, in turn, promotes more inclusive education.

EU recommendations and recognition and challenges in adopting microcredentials

Higher education institutions should consider all 10 recommendations recognized by the European Commission when creating microcredentials: quality, transparency, relevance, valid assessment, learning paths, recognition, portability, and focus on the students, authenticity, information and guidelines. These recommendations emphasize the need for standardized frameworks, quality assurance, and integration into lifelong learning

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pathways to boost credibility and accessibility across the EU.

The definitions higher and nature of microcredentials can potentially build upon these existing specialized programs in education, as regulated by the Montenegrin Law on Higher Education to support lifelong learning.

Currently, the legal framework in Montenegro (National framework for Montenegro) does not formally recognize micro-credentials as a type of short program or course. However, it does recognize special training programs in the field of lifelong learning which can be provided by higher education institutions

For example, the National framework highlight the "Micro-credentials for strengthening teacher competencies (as a form of special programs in the field of higher education for the needs of lifelong learning) as the goal of the Cred4Teach project, are the responsibility of higher education institutions".

In order to ensure quality assurance, the following stakeholders are addressed in the current legal regulations (as it is shown in the image below):

Fig. 1: Participants in the process of developing of microcredentials

Source: National framework for micro-credentials, recommendations, Montenegro, available at: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://cred4teach.eu/wp-content/uploads/2024/07/Montenegro_EN_National-Framework_Micro-Credentials.pdf

It is important to have recommendations such the ones in National framework, because these suggestions from different initiatives and international organizations can aid in shaping and developing guidelines for establishing a framework for microcredentials within higher education

Collaborations between educational institutions and industry stakeholders are playing crucial role in shaping the microcredential landscape in Montenegro. By working together, these entities can develop program that reflect the current need on the workforce, ensuring that the skills taught are directly applicable to real- world scenarios. Support from the *Ministry of education, science and innovation* in Montenegro and *Agency for control and quality assurance of higher education* is much needed in order to provide guidelines and assistance to ensure the Microcredential offered is well-accredited and employability-driven.

By incorporating microcredential, Montenegro can enhance its workforce's flexibility that is boosting its competitiveness in the EU labor market. It also supports the nation's effort to align with Eurpoean education Area goals and meet EU standards (*European Commission* approves measures to standardize microcredentials).

As microcredentials emerge in Montenegro's higher education system, several **key challenges** impede their validation for employers and learners, particularly in quality assurance, standardization, and portability. It should have *quality assurance framework* that is needed to provide accreditation and regular evaluation of these programs.

Also *standardization*, since there is a lack of uniform standards that leads to significant variability in microcredential offerings, making it challenging to compare credentials from different providers.

Also *employer engagement*, since many employers may be unfamiliar with microcredentials, leading uncertainty about their value compared to traditional degrees.

A *lack of awareness* about microcredentials among both learners and employers can hinder their acceptance.

Also, while Montenegro has made strides in improving its digital infrastructure, *challenges remain in terms of internet access, particularly in rural areas*. According to various reports, internet penetration has been improving, but there are still gaps in high-speed connectivity which is essential for effective online learning.

Potential solutions to overcome barriers

To address barriers previous mentioned, we should consider some actions such as:

- Establish local centers or online resources offering technical support to help learners, especially those from marginalizes groups, troubleshoot challenges in accessing digital courses.
- Offer financial support or incentive for students to enroll in microcredentialcourses, especially in some key sectors such as: tourism, IT, renewable energy
- Align microcredentials with job market needs (collaborate with industries and universities to design microcredential programs that can address current and future skill gaps in the workforce.

Additionally, in order to implement microcredentials for effectively continuous learning, several strategies need to be taken into action.

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Fig. 2: Recommended strategies for implementation microcredentials for continuous learning

Source: created by author

Conclusion

In conclusion, the impact of microcredentials on lifelong learning and workforce development in Montenegro is diverse and significant.
They expand the access to education, making it easier for individual to take advantage of learning opportunities. By aligning with job market demands, microcredentials address the specific needs of local industries, helping to reduce skills gaps and better prepare the workforce for both present and future challenges.
Moreover, they are crucial in supporting economic diversification, equipping workers with the skills necessary to promote innovation and economic competitiveness. Microcredentials also contribute to fostering a culture a lifelong learning, encouraging continuous skill development, which is essential for both personal and economic growth.
However, there are challenges to overcome, such as improving digital infrastructure and ensuring the microcredentials are widely recognized. Achieving this will require coordinated efforts between the government, educational institutions and business.
Ultimately, microcredentialsoffer great potential for enhancing lifelong learning and workforce development in Montenegro. By focusing on accessibility, aligning with industry needs, and promoting continuous learning, our country can build a more skilled, adaptable workforce that supports both economic growth and social inclusion.

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The Role of Micro-credentials in Professional Development and Education: Leveraging Digital Transformation

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Abstract

Micro-credentials are short-duration learning experiences outside traditional degree programs designed to certify in-demand skills and competencies. They play a vital role in professional development by enabling individuals to engage in lifelong learning and adapt to the rapid technological advancements shaping today's workforce. This paper explores how micro-credentials equip professionals, particularly educators, with the skills to navigate Industry 4.0 and emerging technologies such as artificial intelligence (AI) and automation. These credentials offer personalized and flexible learning opportunities, allowing teachers to upskill through resources like AI and virtual reality while ensuring the authenticity and security of digital certifications through blockchain technology. In the context of Industry 4.0, micro-credentials address the demand for skills in digitalization and automation, complementing traditional education programs. Scaling micro-credentials faces challenges related to standardization and policy development. Global initiatives, including those from UNESCO and the European Commission, aim to create common standards to ensure their recognition and portability across borders. Continued research and strategic collaboration are needed to realize their full potential in professional development. However, limitations such as reliance on qualitative data, regional disparities in recognition, and the rapid rate of technological change indicate the need for further empirical research and long-term impact assessments.

Keywords: *Micro-credentials, Professional development, Lifelong learning, Industry 4.0, Artificial intelligence*

Introduction

Micro-credentials are short-duration learning experiences offered outside of traditional degree programs. While they do not replace a conventional bachelor's degree, they complement it by providing students with in-demand competencies and recognizing skills often invisible on standard curricula.In a world increasingly shaped by technological advancements, where lifelong learning has become essential, micro-credentials offer a means for professionals to continuously reskill and upskill to meet the demands of the future workforce. These programs enable learners to acquire skills in artificial intelligence (AI), automation, and other emerging technologies, keeping them relevant in a dynamic job market [1,2].

This paper explores the critical role of micro-credentials in professional development and education, especially within today's rapidly evolving digital environment. As Industry 4.0 and AI revolutionize industries, micro-credentials certify short-term learning experiences that help workers and educators acquire the skills necessary to remain competitive. By aligning with the demands of digital transformation, micro-credentials provide a continuous learning pathway for professionals [3].

Micro-Credentials: Definition and Importance

Short-term, focused learning experiences known as micro-credentials are intended to certify specific skills, typically outside traditional degree programs. These programs aim to bridge the gap between formal education and the particular competencies needed for evolving job roles, offering flexible learning opportunities that allow learners to adapt to industry changes and job-specific requirements. Unlike traditional degrees, micro-credentials are often tailored to industry needs, making them ideal for learners seeking immediate, practical applications of their knowledge. As industries evolve rapidly due to technological advancements, micro-credentials offer an efficient pathway for students and professionals to update their skills without the long-term commitment of degree programs[1,4].

In a world where technology is reshaping industries, education systems, and every sector,

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micro-credentials are crucial for addressing the skills gap between employer needs and job candidates. As industries transform through AI, automation, and robotics, micro-credentials ensure learners can continuously upskill and stay relevant in the workforce [2].

Micro-credentials, Teacher Development, and Technological Integration

As the educational landscape evolves with the integration of new technologies, teachers are increasingly required to upskill. Those who have participated in micro-credential programs report positive outcomes and a desire for further engagement, mainly as these credentials can be applied directly to classroom practices, supporting continuous professional growth [5,6].

By leveraging resources like AI, virtual reality (VR), and augmented reality (AR), micro-credentials provide teachers with flexible, asynchronous learning opportunities to learn at their own pace and reduce the burden of balancing professional development with existing responsibilities. Additionally, cohort models foster teacher collaboration, enhancing the learning experience [1, 6, 7].

AI and automation have transformed professional development, especially for teachers. AI can identify teachers' specific learning needs, offer on-demand personalized training, and track their progress in realtime, ensuring that professional development is tailored to individual needs and enhancing the efficacy of training. Automation further improves the delivery of training materials by continuously analyzing and adapting the learning process based on performance, ensuring that learning outcomes are met [7,8].

Blockchain technology ensures the authenticity and security of micro-credentials by providing an immutable, universally accessible system for storing and verifying credentials. As online learning and digital certifications grow, blockchain addresses issues like fraud and verification, offering a secure, transparent way to manage academic achievements. Learners benefit from lifelong ownership of their credentials, while institutions can guarantee their authenticity and longevity, making this technology crucial for modern educational systems [9].

Micro-Credentials in Industry 4.0: Challenges and Global Strategies

As industries rapidly transform with the advent of Industry 4.0, the demand for skills in digitalization, automation, and AI is increasing. By providing flexible, short-term learning experiences, micro-credentials enable individuals to stay competitive by continuously upskilling and adapting to the new technologies driving industrial innovation [2, 10].

Technical and Vocational Education and Training (TVET) plays a crucial role in workforce preparation, combining domain knowledge with vocational skills training. As industries evolve, TVET must adapt, and micro-credentials complement these programs by addressing specific industry needs that traditional TVET may not fully cover. Micro-credentials allow learners to acquire specialized, in-demand skills more efficiently, ensuring alignment with the changing needs of industries [7].

Standardization, transparency, and policy development at both national and international levels are critical obstacles that micro-credentials must overcome to be implemented at scale. Coordinated efforts are required to establish universal standards for the portability and recognition of micro-credentials across countries and educational systems. Global organizations, such as UNESCO and the European Commission, have initiated strategies to ensure the quality and cross-border recognition of micro-credentials, promoting their widespread adoption and long-term value in the global labor market [3, 11].

Conclusion

Micro-credentials are increasingly crucial in professional development, particularly as reliance on digital technologies such as AI and automation grows. They provide a flexible, targeted approach to bridging the skills gap, ensuring that teachers, workers, and learners remain competitive. By certifying in-demand skills, micro-credentials enable professionals to adapt to technological advancements and the evolving needs of the global workforce[1, 11].

Continued research and strategic collaboration between institutions, governments, and industry are essential to fully realizing micro-credential potential. Addressing policy and technological challenges will enable micro-credentials to

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significantly impact professional growth and contribute to the sustainable development of the workforce [6, 11].

Limitations of the Study

This research has several limitations. It relies only on qualitative analysis and secondary data from existing reports, limiting the ability to perform large-scale, quantitative assessments. Incorporating empirical data from various sectors and regions would enhance future studies.The application and recognition of micro-credentials vary widely across countries and industries, complicating the generalization of findings to regions where policy frameworks or technological infrastructure are underdeveloped. Additionally, rapidly evolving technologies like AI, blockchain, and automation may not be fully captured, underscoring the need for continuous research to stay aligned with the dynamic educational landscape.
While the study identifies challenges such as standardization, transparency, and policy development, it does not delve deeply into practical strategies to address these barriers. Furthermore, although the short-term benefits of micro-credentials in upskilling are documented, there is limited longitudinal data on their long-term impact on career advancement, job mobility, and earning potential.Future research should focus on empirical studies across diverse contexts and assess long-term outcomes to understand better how micro-credentials influence professional development and education.

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An Approach to Quality Assurance of Micro-credentials in HEI-s: University of Shkodra, Albania – Case Study

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Abstract

The introduction of micro-credentials into higher education institutions is a flexible and targeted approach to enhance lifelong learning that aims at responding ever-changing labour market demands. However, assuring the quality of such credentials is quite a big challenge since they are less traditional compared to other degree courses that many people have been accustomed to. The aim of the presented study is to present a methodology of quality assurance in microcredentials, referring to an experience that is projected to be implemented at the University of Shkodra in Albania. The added value of this paper is that, through well-known quality assurance frameworks, a proposed quality assurance model is designed and fitted to the particular demands of non-traditional credentials. The study investigates the elements of high-quality provision, based on institutional preparedness and the involvement of key stakeholders. Building on the findings of the above phase, this paper develops a set of recommendations addressing the HEI-s willing to implement micro-credentialing. The outcome is expected to advance the general understanding of the practice of quality assurance in relation to micro-credentials, hence offering valuable insights to both scholars and practitioners.

Keywords: *micro-credentials, quality assurance, higher education, lifelong learning, accreditation, modular learning, skills development, non-traditional credentials*

Introduction

Higher education institutions (HEIs) worldwide are increasingly exploring micro-credentials as a flexible solution to meet evolving demands for lifelong learning and skill acquisition. In Albania, particularly at the University of Shkodra, discussions surrounding the introduction of MOOC-based (Massive Open Online Courses) micro-credentials into the professional development of educators have gained momentum. Micro-credentials offer a more personalized, competency-based approach compared to traditional degree programs, making them especially valuable for professionals seeking to upgrade specific skills. As Berens (2023) points out, micro-credentials allow teachers to target specific areas of improvement through personalized professional development, which enhances their teaching practices and directly impacts student learning. However, for successful integration into Albanian HEIs, robust quality assurance mechanisms are essential.

This paper provides an analysis of quality assurance practices at the University of Shkodra and explores the challenges and opportunities of implementing micro-credentials. The study uses institutional data, guidelines from international organizations, and insights from recent conferences on education.

Existing Quality Assurance Framework

The University of Shkodra operates within a comprehensive and well-established framework for quality assurance, as outlined in its "Manual i Cilësisë" (Quality Manual) (University of Shkodra, 2022). This manual serves as a foundational document that defines the university's commitment to maintaining high educational standards across all programs and departments. A key element of this framework is the Continuing Education Training Laboratory, established in 2019 as part of the Erasmus+ TEAVET project. This initiative aims to enhance teacher competencies within Albania, aligning with broader educational reform goals (University of Shkodra, 2019a).

Each department and program of study within the university is governed by its own set of regulations.

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The Training Laboratory has its own "Rregullore e Laboratorit të Trajnimeve të Edukimit të Vazhduar" (Regulation of the Continuing Education Training Laboratory) (University of Shkodra, 2019b). These regulations demand that professional development courses must adhere to established quality standards. The Quality Assurance Office plays a critical role in this process, focusing on existing programs to ensure they meet the standards required by the Quality Assurance Agency of Higher Education (ASCAL) in Albania.

The Quality Assurance Office is responsible for designing surveys for students and instructors regarding the quality of programs of study and individual courses/modules offered by the university. This data-driven approach helps to identify areas for improvement, enhances the educational experience, and ensures that the university's offerings remain relevant and effective. By regularly collecting and analyzing feedback, the office contributes to the continuous improvement of educational quality across all levels.

The face-to-face courses delivered through the Training Laboratory have received accreditation from the Ministry of Education, Sports, and Youth, validating their significance within the professional development sector (Ministria Arsimit, Sportit dhe Rinise, 2019). This accreditation not only affirms the quality of these programs but also ensures their recognition in both educational and professional contexts, which is essential for the ongoing development of educators.

However, a significant challenge now lies in translating these established quality standards into the area of online education, particularly concerning MOOC-based micro-credentials. As the demand for flexible, accessible learning options continues to rise, the university must adapt its quality assurance processes to encompass these new formats. Research suggests that transitioning to online formats requires innovative approaches to maintain engagement and ensure effective learning outcomes, a task that necessitates thorough planning and implementation (UNESCO, 2022; ASCAL, 2022).

Moreover, as micro-credentials become more popular in global education systems, it is crucial for the university to ensure that these offerings are credible and recognized by stakeholders, including potential employers. Establishing robust quality assurance mechanisms for micro-credentials will not only reinforce the value of these programs but also position the University of Shkodra as a leader in contemporary educational practices. As the institution embarks on this journey, it must continue to uphold its commitment to quality and excellence, ensuring that all educational offerings—traditional and innovative alike—meet the highest standards of quality and relevance.

Challenges in Transitioning to MOOC-based Micro-credentials

The transition from traditional professional development courses to MOOC-based micro-credentials presents a range of challenges that must be carefully navigated to ensure successful implementation and acceptance.

Digital Skills Gap

One of the most significant barriers to the effective implementation of MOOC-based micro-credentials is the digital literacy of both students and educators. In Albania, many teachers face difficulties in adapting to the digital environment due to insufficient advanced digital skills, which can impede their ability to engage fully with online learning platforms (Hadri, Erkoçi, & Këçira, 2023). To facilitate a successful transition to micro-credentials, it is crucial to invest in professional development programs tailored to enhancing educators' digital competencies. Such training must not only focus on basic technical skills but also emphasize the pedagogical strategies necessary for effective online teaching. Without these foundational skills, the overall quality of the learning experience for students will suffer, potentially undermining the credibility and acceptance of the micro-credentials offered. As noted by Berens (2023), the effectiveness of micro-credentialing is closely tied to aligning digital learning opportunities with educators' specific needs, underscoring the importance of targeted professional development in this area.

Lack of Familiarity with Online Pedagogy

Teachers in Albania, who are accustomed to traditional, face-to-face learning environments, often find it challenging to make the pedagogical shift necessary for designing and delivering effective online courses (Karakaçi& Deda, 2023). MOOCs inherently rely on self-directed learning and digital interactions, both of which necessitate a more sophisticated understanding of online teaching methodologies. Consequently, there is a pressing need for the development of teacher training programs that focus specifically on online pedagogy. Such programs should equip educators with the skills to create engaging, interactive, and effective online learning experiences. This shift not only involves mastering technology but also

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understanding how to facilitate collaboration among students and assess learning outcomes in a digital context.

Inadequate Technological Infrastructure

The successful implementation of MOOC-based micro-credentials is also contingent upon a solid investment in technological infrastructure. Higher Education Institutions, such as the University of Shkodra, must ensure that their Learning Management Systems (LMS) can support the interactive and collaborative nature of online learning. This includes features that facilitate peer collaboration, automated assessments, and other digital tools that enhance the learning experience. Additionally, reliable internet access is essential for both educators and students; however, this remains a significant challenge in many areas of Albania (OECD, 2021). Without the necessary technological infrastructure, the promise of high-quality, accessible education through MOOCs may not be realized, limiting their effectiveness as a professional development tool.

While the university has experience with traditional courses, transitioning to MOOC-based micro-credentials presents unique challenges that need to be addressed.

- ***Delivery Format*:** MOOCs are predominantly online, enabling learners to engage with content asynchronously. This shift from a structured classroom setting to a self-paced online format requires adjustments in teaching strategies and student engagement techniques.
- ***Assessment Methods*:** The nature of assessment in MOOCs—often relying on automated quizzes and peer reviews—differs markedly from the personalized feedback typically offered in traditional classroom settings. This transition necessitates new approaches to evaluation that maintain educational integrity and effectiveness.
- ***Scalability:*** MOOCs have the potential to reach a global audience, vastly expanding access to education. However, traditional courses are generally limited to in-person participants, presenting challenges in maintaining quality and personal interaction in larger online environments.

Given these differences, there is an urgent need for new quality assurance strategies that can effectively address both academic standards and the logistical challenges inherent in delivering courses through digital platforms.

Opportunities for Quality Assurance

Despite the challenges, the transition to micro-credentials presents an opportunity to expand the reach of Albanian HEIs and improve access to lifelong learning.

Alignment with International Standards

Micro-credentials offer the opportunity for Albanian HEIs to align their offerings with international standards. The European Union has already made significant progress in creating a standardized system for recognizing micro-credentials across member states (European Commission, 2020). By aligning with these frameworks, Albanian institutions can ensure that their micro-credentials are recognized both nationally and internationally.

Competency-based Assessment

Micro-credentials are often competency-based, focusing on the mastery of specific skills rather than time spent in class. This presents an opportunity for Albanian HEIs to adopt more flexible learning pathways that cater to the needs of working professionals. According to UNESCO, micro-credentials play a significant role in promoting flexible learning pathways by offering customizable and accessible educational options. These credentials are designed to meet the needs of a diverse range of learners, including working professionals, by aligning learning with labour market demands and technological advancements (UNESCO)(EPALE - European Commission).The University of Shkodra's Quality Manual can be adapted to ensure that competency-based assessments maintain academic rigor while meeting industry demands.

Continuous Improvement of Quality Assurance Practices

As observed with the University of Shkodra's accredited face-to-face courses, a strong commitment to continuous improvement is crucial for maintaining and enhancing the quality of micro-credentials. Continuous improvement is not merely a procedural step but a fundamental philosophy that permeates every aspect of educational practice. This proactive approach emphasizes the necessity of regular evaluation and enhancement of course content, instructional strategies, and overall educational outcomes. The OECD (2021) emphasizes the importance of establishing regular review and feedback mechanisms to ensure that online courses remain relevant and effective. These mechanisms are integral to identifying areas for

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enhancement and ensuring that educational offerings are responsive to the evolving needs of students and the labor market.

Feedback from stakeholders, including students, educators, and industry representatives, plays a vital role in this continuous improvement process. By collecting and analyzing data on the effectiveness of micro-credentials, institutions can make informed decisions that drive innovation and enhance the overall quality of their educational offerings. This iterative process allows institutions to adapt and refine their courses based on emerging trends, technological advancements, and shifts in workforce demands.

Recommendations for the Future

To ensure the successful implementation of MOOC-based micro-credentials at the University of Shkodra and other Albanian higher education institutions (HEIs), several strategic recommendations are proposed:

1. ***Develop Professional Development Programs for Educators:***
   - Investing in programs that enhance the digital and pedagogical competencies of educators will enable them to design and deliver effective MOOCs.
   - Capacity-building initiatives should include training for faculty and staff to develop skills in MOOC design and provide digital skills workshops for teachers to enhance their ability to engage with online learning tools.
2. ***Strengthen Technological Infrastructure:***
   - It is essential to upgrade the university's learning management systems (LMS) and digital tools to support the development and delivery of MOOCs.
   - Furthermore, building a well-equipped studio for recording and preparing high-quality video lessons and presentations will ensure that the content created is engaging and meets professional standards.
3. ***Align with National and International Standards:***
   - Work closely with national accreditation bodies, such as ASCAL, and international organizations like the European Commission to ensure that micro-credentials are recognized and transferable.
4. ***Adopt a Competency-based Approach****:*
   - Shifting the focus from time-based learning to competency-based assessments will ensure that learners acquire the skills required by employers.
5. ***Establish Robust Quality Assurance Mechanisms****:*
   - Quality assurance processes must evolve to incorporate digital elements into the existing framework, including new forms of assessment and evaluation suited to online learning.
   - Collaboration with external experts will be crucial to ensure the validity and reliability of assessments, maintaining academic rigor while addressing the specific challenges of online content production.

Conclusion

The introduction of MOOC-based micro-credentials at the University of Shkodra presents a significant opportunity to enhance lifelong learning in Albania. This innovative approach reflects the institution's commitment to meeting the evolving educational needs of students and professionals. However, realizing this potential requires a steadfast commitment to quality assurance throughout the implementation process.

As the university moves towards digital learning formats, it is crucial to recognize the necessity for infrastructure improvements and capacity building. Investments in modern technology, including a dedicated studio for producing high-quality educational content, will be pivotal in creating engaging and effective MOOC materials. Moreover, the development of comprehensive training programs for educators and students will ensure that all stakeholders are equipped with the skills needed to succeed in an online learning environment.

Quality assurance processes must evolve to address the specific challenges associated with online education, prioritizing the maintenance of academic standards and the integrity of assessments. Only by taking a proactive approach to these challenges, the University of Shkodra can position itself as a leader in the implementation of high-quality, competency-based micro-credentials, eventually improving the educational situation in Albania.

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Continuous Training of Foreign Language Teachers

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Abstract

This paper addresses the topic of continuous training for foreign language teachers, emphasizing its importance in the current context to tackle the challenges and difficulties in teaching foreign languages and the opportunities to overcome them. The theoretical framework of continuous training is introduced, including its definition, objectives, and the importance of adapting to pedagogical and technological advancements. The necessity of this training stems from the specific needs of foreign language teachers, such as assessing linguistic and pedagogical skills, identifying gaps in initial training, and adapting to various teaching contexts (primary, secondary, or higher education).
We also explore methods and approaches in continuous education, including traditional forms (seminars, lectures), online or hybrid training, international exchanges and collaborations, and the use of digital technology in language teaching. Before concluding, the paper evaluates the impact of continuous training by presenting methods for assessing training programs, feedback from trained teachers, and its influence on the quality of foreign language teaching.
The paper concludes with an emphasis on the commitment to continuous teacher training and future perspectives in this field.

Keywords: *foreign languages, continuous training, teachers, competencies, etc.*

Introduction

The importance of continuous training for foreign language teachers. Continuous training for foreign language teachers is essential for ensuring quality teaching and adapting to pedagogical and technological developments. In a globalized world where intercultural communication is key, teachers must constantly update their linguistic and pedagogical skills. Continuous training not only enhances teachers' knowledge but also familiarizes them with new teaching methods, digital tools, and innovative didactic approaches.

Current context: challenges and opportunities in language teaching. Teachers face numerous challenges in their profession today:

- **Rapid technological change:** The integration of digital technologies in education requires teachers to be regularly trained in using online teaching tools, platforms, and multimedia resources.
- **Diversity of students:** Increasingly heterogeneous classrooms demand that teachers adapt their pedagogy to cater to varied skill levels and specific needs.
- **Curriculum changes:** Frequent revisions in language curricula necessitate that teachers stay informed about new approaches and content to remain relevant and effective.
- **Limited time and resources:** Teachers may struggle to find the time and resources for continuous training, which can hinder their professional development.

Despite these challenges, teachers recognize that every difficulty comes with opportunities, such as:

- **Access to diverse training:** With the growth of online training, teachers now have access to a wide range of resources and programs.
- **Collaboration and experience sharing:** Professional networks and learning communities allow teachers to share experiences, exchange pedagogical practices, and support each other in professional development.
- **Pedagogical innovations:** Research in language didactics and new pedagogical approaches offer opportunities to improve language teaching, making courses more engaging and effective.
- **Recognition of skills:** Micro-credentials and online certifications provide official acknowledgment of acquired skills, which can be beneficial for teachers' careers.

Theoretical Framework of Continuous Training

Definition of continuous education. Continuous training encompasses all educational and training activities undertaken by professionals, including teachers, after their initial education. It aims to update, deepen, or diversify their skills and knowledge throughout their careers. In foreign language teaching, continuous training enables teachers to stay informed about new methodologies, technological tools, and linguistic

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developments while addressing the diverse needs of their students.

Objectives of continuous training for foreign language teachers:

1. **Improvement of language skills:** Teachers must maintain and enhance their proficiency in the language they teach to serve as appropriate linguistic models for their students.
2. **Development of pedagogical skills:** Continuous training allows teachers to explore new pedagogical approaches, discover innovative teaching strategies, and tailor their practices to the specific needs of their students.
3. **Integration of technologies:** With the rapid evolution of digital tools, it is crucial for teachers to be trained in their use for language teaching, enhancing student engagement and learning outcomes.
4. **Collaboration and experience sharing:** Continuous training fosters exchanges among teachers, enabling them to share successful practices and learn from each other in a collaborative environment.

Theoretical Framework of Continuous Training

The importance of adapting to pedagogical and technological developments

The necessity of adapting to pedagogical and technological advancements lies in addressing contemporary challenges in language teaching. Teachers must:

- **Adapt to new methodologies:** Research in language didactics and emerging learning theories require teachers to revise and adjust their teaching practices to remain effective.
- **Use digital tools:** Integrating technology in education provides diverse and engaging opportunities for learning. Teachers must be trained to use these tools effectively and appropriately in their teaching.
- **Address students' needs:** Today's classrooms are increasingly diverse, with students possessing different learning styles and skill levels. Continuous training helps teachers develop differentiated strategies to meet these varied needs.
- **Prepare for evolving social expectations:** Changing job market demands and parental and student expectations require teachers to adapt their teaching to maintain relevance and quality.

Specific Needs of Foreign Language Teachers

Foreign language teachers have specific needs, particularly in assessing and developing their linguistic and pedagogical skills, identifying gaps in their initial training, and adapting their practices to various teaching contexts.

1. Assessment of linguistic and pedagogical skills

Foreign language teachers must master the language they teach and possess the pedagogical skills needed to effectively convey it to their students. Regular assessment of these skills is crucial to identifying strengths and areas for improvement, which can be achieved through:

- Standardized language proficiency tests to evaluate their linguistic competence.
- Classroom observations by peers or trainers to assess teaching abilities.
- Follow-up interviews to discuss their progress and training needs.

2. Identifying gaps in initial training

Even with strong initial training, language teachers may experience gaps in areas such as technology integration or addressing specific student needs. Identifying these gaps allows for targeted continuous training. This can be done through:

- Self-assessment questionnaires for teachers to identify their own needs.
- Discussions with trainers and peers to share challenges encountered.
- Analysis of feedback from students and parents to identify areas for improvement.

3. Adapting to different teaching contexts

Foreign language teachers must adapt their practices to different teaching contexts, whether in primary, secondary, or higher education. This includes:

- Familiarity with specific curricula and objectives at each level.
- Mastery of pedagogical strategies tailored to students' age and skill levels.
- Collaboration with teaching teams to ensure continuous language learning progress.

Methods and Approaches in Continuous Training

Continuous training for foreign language teachers involves a variety of methods and approaches to meet their specific needs and improve their teaching practices.

1. Traditional Training (Seminars, Lectures)

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Traditional forms of training, such as seminars and lectures, remain key elements of continuous training. These formats allow teachers to meet in person, exchange ideas, and share experiences. Seminars often focus on practical skills, while lectures address pedagogical theories or recent research in language didactics.

2. Online and Hybrid Training

With the advent of digital technologies, online and hybrid training has become increasingly popular. These formats offer flexibility, enabling teachers to follow courses at their own pace and balance their busy schedules. Hybrid training combines online sessions with face-to-face meetings, fostering interaction and enabling independent learning. For example, distance learning programs for novice foreign language teachers integrate independent learning phases with synchronous group sessions.

3. International Exchanges and Collaborations

International exchanges and collaborations provide teachers with opportunities to explore other educational systems and share innovative practices. These initiatives can take the form of exchange programs, internships abroad, or collaborative projects between institutions. Such initiatives inspire teachers with diverse teaching methods and enrich their practices. For instance, collaboration projects among Central and Eastern European countries have been developed to enhance the professional skills of foreign language teachers, fostering expertise sharing and networking.

4. Use of Digital Technologies in Language Teaching

Integrating digital technologies into language teaching is a crucial approach in continuous education. Teachers should become familiar with various digital tools, such as e-learning platforms, language applications, and multimedia resources. These technologies make learning more interactive and engaging for students. Additionally, the use of artificial intelligence and other digital tools supports language learning by providing personalized and tailored resources.

Assessment of the Impact of Continuous Training

1. Methods for Assessing Training Programs

Assessing the effectiveness and impact of training programs is vital. Methods include:

- **Surveys and Questionnaires:** Distributed at the end of training to gather participants' feedback on content, pedagogy, and applicability of acquired skills.
- **Hot and Cold Evaluation:** Conducted immediately after training (hot) and several months later (cold) to measure real-world impact on professional practice.
- **Performance Analysis:** Evaluating teachers' performance before and after training using indicators such as student performance improvement or increased student satisfaction.

2. Feedback from Trained Teachers

Feedback from trained teachers is crucial for evaluating the impact of training programs. This feedback can be collected through:

- **Testimonies and Interviews:** Teachers share their experiences in interviews or focus groups, providing qualitative insights into the application of acquired skills and changes in their teaching practices.
- **Knowledge Sharing:** Trained teachers are encouraged to share their knowledge and skills with colleagues, amplifying the training's impact within the institution.

3. Impact on the Quality of Foreign Language Teaching

Assessing the impact of continuous training should also focus on its effect on the quality of foreign language teaching. Indicators include:

- **Improved Teaching Practices:** Teachers incorporate new methods and strategies, enhancing student engagement and learning outcomes.
- **Adaptation to Students' Needs:** Effective training enables teachers to better meet diverse student needs by tailoring their teaching approaches to different learning styles and skill levels.
- **Student Satisfaction:** Surveys measure student engagement and satisfaction, key indicators of teaching quality.

Conclusion

Continuous training for foreign language teachers is essential for ensuring quality teaching and adapting to pedagogical and technological developments. It enables teachers to enhance their linguistic and teaching skills, discover new

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teaching methods, and meet diverse student needs. Training programs should combine traditional and digital methods as well as international collaborations.

Commitment to Continuous Teacher Education

To ensure effective and sustainable training, all stakeholders must remain committed. Teachers should actively engage in professional development, and educational institutions must provide tailored programs to address teachers' needs.

Future Perspectives

The future of continuous training for foreign language teachers looks promising, with new technologies and innovative pedagogical approaches emerging. Artificial intelligence, e-learning tools, and virtual reality offer new opportunities to make language learning more interactive and engaging. International collaboration and the exchange of best practices will further enhance training quality and teaching effectiveness.
This paper draws on contemporary theoretical and practical studies, providing a solid foundation for understanding various aspects of continuous training for foreign language teachers, focusing on needs, methods, exemplary programs, and their impact on teaching.

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Micro-credentials as a tool for upskilling pedagogy of assistant teachers in education primary, for the support of children with needs especially in the Gjirokastra District

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Abstract

Teaching assistants ensure the inclusion and pedagogical support of children with special needs. Professional development is essential to address their unique requirements, equipping them with the necessary knowledge and skills. Micro-credentials emerge as an innovative and valuable tool for enhancing their specialized skills, contributing to improving their pedagogical competencies.
This study examines the role and impact of micro-credentials on enhancing the pedagogical competencies of teaching assistants in the Gjirokastra District by analyzing practices, perceptions, and training needs. The methodology involves a questionnaire collecting data from 50 teaching assistants in the Gjirokastra District. The findings reveal that teaching assistants have little to no awareness of micro-credentials. However, they regard them as an important tool for developing specialized skills. Lack of time, costs, and limited opportunities for specialized training are the main barriers preventing them from participating in such programs. They view micro-credentials with great interest and see them as a solution for developing specific skills.
The study suggests that to maximize the value of micro-credentials, it is necessary to develop flexible, financially affordable, online, and hybrid training formats. Promoting continuous professional development cultures, such as micro-credentials, encourages teachers and enhances their opportunities for easy improvement. In this way, teaching assistants acquire advanced new skills, creating a more inclusive and effective learning environment for students with special needs.

Keywords: *professional development, micro-credentials, assistant teachers, children with special needs, training.*

1. Introduction

Teachers are the backbone of education. "Transforming education starts with teachers – it reminds us that teachers and educators deserve to work in a supportive environment, have access to professional development, and be empowered to be innovative and creative to ensure their students succeed. From critical thinking to coding and literacy, educators are helping the next generation develop the skills they need to adapt to our rapidly changing world, succeed in tomorrow's economy, and find solutions for future challenges. Justin Trudeau, Prime Minister of Canada on October 5, 2022, said that "Microcredentials", "badges" or "micro certificates" have become a crucial aspect of personalized professional development in recent years and one of the most prominent topics in the policy literature. skills (OECD, 2020 European Commission, 2020 Cedefop, 2021). Microcredentials enable vocational educators to see the connections teachers have made to their practice by asking teachers to submit artifacts that show how they have integrated practice into their classrooms.
Teachers play a vital role in shaping the future of their students. However, teachers must continue to be familiar with the newest teaching methods and technologies to do this well. Microcredentials hold teachers to a higher level of rigor. Professional development often requires teachers to make applications but rarely requires teachers to think metacognitively or evaluatively. Carefully designed micro-credentials can support educators as they engage in learning. . Through micro-credentials, teachers take control of their professional learning and customize their submissions to meet their context and needs. Every student is unique, with their strengths, weaknesses and learning styles. Traditional professional development methods often lack the necessary flexibility and relevance,

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and this is where micro-credentials come into play. These provide a more personalized and competency-based approach to teacher professional development. Micro-credentials provide several benefits for teacher professional development, including.

Personalized learning. Micro-credentials give teachers the ability to choose specific skills they want to improve based on what they need and like. This personal approach ensures that micro-credentials are relevant and immediately applicable to the way they teach. For example, a teacher who has trouble using technology in the classroom – can choose a micro-credential that focuses on digital tools for teaching.

Flexibility. Teachers can complete microcredentials when it suits them and at their own pace. This ability to be flexible helps, given how demanding teaching is. Teachers can fit their professional development around their free schedules.

Competency-based assessment. Micro-credentials focus on skills rather than time spent. Teachers need to demonstrate that they can use new knowledge and skills in their classrooms, which demonstrates real change. In this way, teachers take an active role in learning.

Budget-friendly. Micro-credentials can save money compared to older professional development options for teachers. Schools can invest money in specific skills without the high costs that come with seminars or conferences. You can find many micro-credential platforms that are free or inexpensive so that more teachers can use them.

Know-how. Micro-credentials give teachers special recognition for their hard work and dedication to improving their skills. Micro-credentials provide a digital badge or certificate. Teachers can add these to their CVs and professional profiles, showing others the specific skills they have learned. This recognition boosts teachers' confidence and shows that they are committed to learning and continuous improvement.

Improved student outcomes. When teachers learn new things through microcredentials, they can teach better, which helps students do better. They will use new ways to make learning more interesting and work better. For example, a teacher who earns a micro-credential in customized teaching methods can adapt to how each student learns best. This makes it easier for students to understand and remember what they have been taught.

Immediate applicability. Unlike traditional professional development programs that can cover broad topics, microcredentials focus on specific, actionable skills that can be immediately implemented in their classrooms. This rapid use of new knowledge and skills aids learning and brings rapid improvements in the way students learn.

Professional Growth

Micro-credentials are designed to be stackable, meaning teachers can earn multiple badges over time, building a comprehensive portfolio of their professional development accomplishments. This fosters continuous learning and improvement, which is essential in the rapidly changing world of education.

The role of micro-credentials in addressing teacher needs

Addressing skills gaps: Micro-credentials help teachers identify and improve specific areas where they need development. These could be areas such as using educational technology, adapting instruction to the different needs of students, or understanding social-emotional learning. When teachers focus on these important skills, they can teach more effectively and help their students learn better. This helps teachers understand the needs of their students and provide individual support, making learning more enjoyable and successful.

Promoting equity and inclusion: Micro-credentials help teachers create an equitable and welcoming classroom. They learn how to understand and support students from different backgrounds and help students who have experienced difficulties. This makes the classroom a comfortable and supportive place for all students to learn and grow.

Fostering collaboration and sharing: Micro-credentials help teachers work together and share their knowledge. They learn from each other's strengths and experiences, building a supportive team that benefits everyone. This teamwork makes teaching more enjoyable and effective, benefiting students.

Adapting to change: The field of education is always changing, with new technologies, teaching methods and student needs constantly emerging. Micro-credentials allow teachers to quickly acquire the skills and knowledge needed to keep up with these changes and remain effective in their roles.

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Micro-credentials represent a significant shift in approach to teacher professional development. It offers personalized, flexible, and competency-based opportunities for educators. Microcredentials have the potential to transform the professional development of teachers, ensuring they have the skills and knowledge needed to succeed.

Methods and material

This research aims to study the potential role of micro-credentials to equip primary education assistant teachers with specialized skill sets for children with special needs in primary education in Gjirokastra District; the benefits of micro-credentials in teacher professional development. In this study, a survey was used to collect data from primary education assistant teachers in Gjirokastra District. Its purpose was to examine the role of micro-credentials in enhancing the pedagogical competencies of assistant teachers in primary education. In his focus is the measure of recognition of micro-credentials by assistant teachers, their role and their impact on professional development.

Sampling: To ensure depth and breadth of data coverage, the sampling frame was continuously revised and adapted according to the requirements of the study. The champion has been chosen 50 assistant teachers in the primary education of the District of Gjirokastra. To the people who take part in the questionnaire, he gave you brief information about the micro-credentials. The two research questions guiding the paper are:

- *What are the perceptions and training needs of assistant teachers in primary education regarding micro-credentials in Gjirokastra District?*
- *How do micro-credentials affect the increase in pedagogical competencies of primary education assistant teachers in Gjirokastra District?*

Design: Quantitative research was conducted. The questionnaire was designed to collect data to understand assistant teachers' knowledge and perceptions of micro-credentials. The questions were selected with multiple choice and open-ended questions to collect suggestions and detailed comments. It was distributed with Google Forms to ensure easy access and wide participation. This measurement instrument includes demographic questions (age, gender, level of education), on knowledge about microcredentials, on the source of information about them, questions on participation of microcredentials related to supporting children with special needs, questions on types of microcredentials and suggestions for improvement.

Data processing and analysis: The data collected served to identify trends and perceptions of teaching assistants regarding micro-credentials. Answers to open-ended questions helped to gather their suggestions and recommendations for improving the offering of micro-credentials. The results of the study helped to identify the needs and preferences of assistant teachers for training and provide recommendations for improving the offer of micro-credentials for this specific professional group.

Answer to the first research question:

What are the perceptions and training needs of assistant teachers in primary education regarding micro-credentials in Gjirokastra District?

It seems that teachers are little informed about micro-credentials. They show interest in this form of training. The teachers got the information about their existence from their colleagues and the internet. Some teachers have taken advantage of micro-credentials. They say that this practice has helped them in working with children with special needs. They feel that this form of training has a positive impact on their work practice.

Answer to the second research question:

How do micro-credentials affect the increase in pedagogical competencies of primary education assistant teachers in Gjirokastra District?

Teaching assistants are committed to their professional development and are willing to get involved. They value micro-credentials as training that provides appropriate methods to meet the diverse needs of learners. They believe that micro-credentials help improve their skills in differentiating instruction, classroom management, and supporting students with needs, increasing effectiveness in the education process.

You can find the details of the questionnaire in APPENDIX.1.) at the end of the paper.

The results

Conclusions from the questionnaire:

All participants are female, mainly in the 31-40 and 51+ age groups. Most of them have master's level education or another advanced level.

Knowledge and perceptions of microcredentials

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- A good part of the participants are familiar with the concept of microcredentials.
- Most have learned about microcredentials through training provided by educational institutions, the Internet, or from their peers.

Participation in microcredentials:

- Only two of the participants have pursued micro-credentials related to supporting children with special needs, while the others have not had such experience.

Needs and suggestions for microcredentials:

- Participants emphasized the need for micro-credentials focused on supporting children with special needs.

Suggestions for improving the provision of micro-credentials include their inclusion in universities and more frequent offerings in schools.

Recommendations

Development of specialized micro-credentials: Considering the requirements of the participants, it is important to develop micro-credentials focused on supporting children with special needs. These programs should include practical techniques and strategies that teaching assistants can use in the classroom, the inclusion of play and creative activities in the lesson, specific and practical methods to include students with autism spectrum disorder in the classroom, strategies to develop language and communication with students with communication problems, the creation and use of different tools that suit the needs of students, programs and activities that support the social and emotional development of children with special needs, methods for adapting materials for students with different levels different abilities and needs.

Integration of micro-credentials in educational institutions: Micro-credentials should be integrated into university curricula and offered as part of professional development programs for teaching assistants. This will ensure that they have ongoing access to the necessary training.

Increasing the frequency and accessibility of microcredentials: Offering microcredentials more frequently and making them available in schools will facilitate the participation of teaching assistants and ensure that all have the opportunity to receive the necessary training.

Awareness: Organizing awareness campaigns to increase knowledge and understanding of micro-credentials among teaching assistants is imperative. This may include seminars and informational materials explaining the benefits and application of microcredentials.

Institutional support: Educational institutions and government organizations should provide logistical and financial support for teaching assistants who wish to pursue microcredentials. This may include scholarships, grants and flexible schedules for attending training.

By following these recommendations, better professional development and greater support for teaching assistants will be provided, positively influencing the quality of teaching and support for children with special needs

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Appendix .1.

1. 1 Demographic Information:

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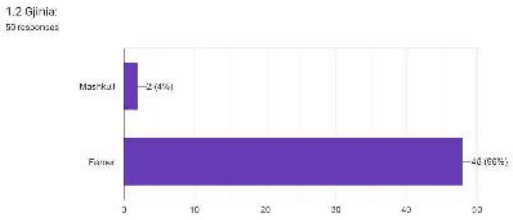
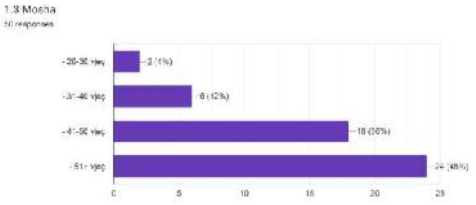
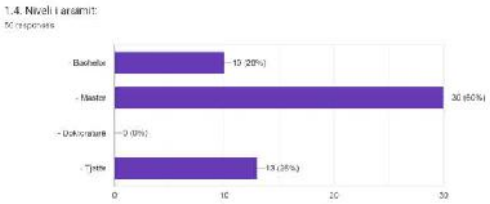
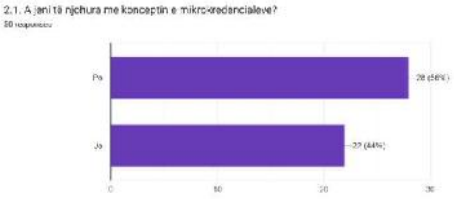
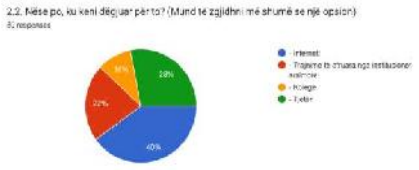


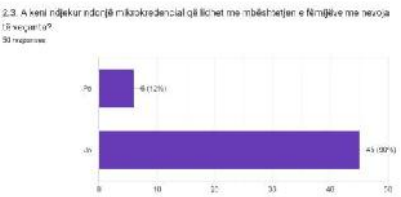




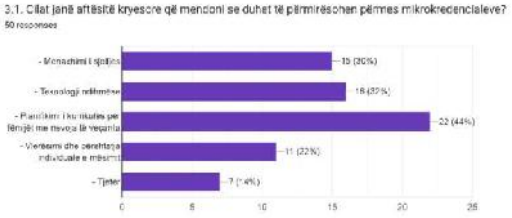
2. Experience and knowledge of microcredentials







3. Needs and preferences for microcredentials



4. Practical experience

4.2. Please share a concrete example of how a microcredential has improved your experience working with children with special needs: 20 responses

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The formation of a modern national qualifications system is one of the key tasks for every country

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Abstract

Based on the analysis of the official materials and analytical reports of international organisations (European Commission, European Training Foundation, CEDEFOP, etc.), as well as the results of the research by national researchers, this article outlines the aspects of the development of micro-credentials and their essence as a component of the National Qualifications System, reveals the specifics of the use of micro-credentials in the higher education system.

Adaptation of national legislation to the European Union acquis is one of the conditions for successful European integration. One of the directions of this process is integration of European norms into Ukrainian legislation. The introduction of micro-credentials into the National Qualifications System is important in the context of one of the main tasks of any country, namely, the formation of the modern National Qualifications System, particularly via the initiatives defined by the relevant documents of the European Commission. The European Commission plays a key role in promoting the integration of micro-credentials in the European Education Area, that is why the Recommendation on a European approach to micro-credentials for lifelong learning and employability, adopted in 2022, became a global impetus for the development of micro-credentials (Council Recommendation on a European approach to micro-credentials for lifelong learning and employability) (Council of the EU, 2022). It has been established that micro-credentials open up promising opportunities for learning and developing skills throughout life. Their integration into the higher education system is an important step in the development of formal and non-formal education that meets the current needs and challenges of the labour market. Therefore, micro-credentials are an important tool for ensuring the flexibility and accessibility of education in modern society.

Introduction

Joining the European Qualifications Area means, among other things, the implementation of the European policy on micro-credentials. This policy emphasizes short-term learning, quality assessment of micro-credentials and the possibility of accumulating them to obtain a higher qualification. Micro-credentials are becoming an important tool to ensure continuous professional development and adaptation to rapidly changing labor market requirements. CEDEFOP (2024) emphasizes that micro-credentials will continue to play a key role in both workforce development, individual employability and as a bridge to continuing learning.

In the context of the European integration processes in Ukraine, one of the key objectives is to establish a modern National Qualification System. Qualifications play an invaluable role in building human capital and filling the labour market with employees with relevant knowledge, skills and abilities. It is well known that the economic development of the country in general and the economy in particular is impossible without educated, skilled workers. So nowadays for the sustainable economic development of the state people who constantly strive to learn new things, develop their way of thinking, people who want to adapt to the needs of the labour market, be ‘in trend’ and become more resilient to the challenges of today are of high necessity! The twenty-first century significantly changes the requirements for the employee in general, as today the labour market is not so much interested in long-term work experience as the ability to adapt to new conditions, the ability to learn new things in a short period. (Semigina & Rashkevych & Reznik & Stepankova, 2024). The national labour market is working despite the challenges and demonstrates well-known European trends. And it is micro-credentials that provide flexibility and help to reduce the gap between traditional academic qualifications and dynamic labour market demands, as well as adapt education to changes in the labour market (Rashkevych & Semigina, 2022).

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Ukraine's experience

Our country became an EU candidate country in June 2022. This fact raises new challenges for our country and requires a significant rethinking of new realities, particularly in the field of qualifications. First and foremost, it is about our country's accession to the European area of educational and professional qualifications, in particular, the implementation of the European policy on micro-credentials. This policy emphasizes short-term training, quality assessment and stackability of micro- credentials for higher qualifications. Micro-credentials are becoming an important tool for ensuring continuous professional development and adapting to rapidly changing labor market requirements.

According to the EU Council perspective, micro-credentials should not only be developed as a separate training course, but also be based on the identification of training needs, relevance to labour market demands and be regularly updated. This provision clearly demonstrates the need for micro-credentials developers to adapt their offers to current labour market requirements and other social needs. Although Ukraine has been actively developing its qualifications system over the past few years, based on international experience and we have already made some successful steps to date. National Qualifications Agency was one of the first to pick up the topic of 'micro- credentials and in 2022 created a working group that began working on defining the place of micro-credentials in the National Qualifications System. Currently, the definition of the term 'micro-credentials' is not yet reflected in our current legislation, but the draft law 'On the National Qualifications System', which defines the place and role of micro-credentials, is at the final stage. Therefore, Ukraine is currently implementing micro-credentials using the definition of 'micro-credentials' from the Council Recommendation on a European approach to micro-credentials for lifelong learning and employability. At the same time, legislation and regulations provide for the recognition of non-formal education results in educational institutions (Ministry of Education and Science of Ukraine, 20225), and qualification centres are being developed to validate non-formal and informal learning outcomes and obtain professional qualifications on its basis (Cabinet of Ministers of Ukraine, 20216). All of this forms the institutional background that can enable the rapid implementation of the European policy on micro-credentials, recognizing them as part of the National Qualifications System (Semigina, 2024). The education model is changing: short, flexible learning is becoming increasingly popular. Especially as an addition to degree education, which ends with a certain academic qualification (MICROBOL Project, 2021; OECD, 2019). We understand that micro-credentials will become a tool for developing and implementing new, effective and flexible approaches for training specialists of a new generation, and that is why National Qualifications Agency has been particularly keen to delve into the issue of introducing micro-credentials in Ukraine within the CRED4TEACH project, as it is a provider of qualifications at the state level. The Agency was one of the first to note that micro-credentials are a trend in the development of modern continuing education! The Ministry of Education and Science of Ukraine is also worth mentioning, as it is the body that can license short-term postgraduate studies and certifies teachers of higher education institutions. Therefore, on the basis of the developed Recommendations (national framework), higher education institutions develop their own institutional frameworks, which are conceptually implemented within the provisions of the Law of Ukraine "On Education" in terms of the right of educational institutions to autonomy, including academic autonomy. Academic autonomy includes the level of independence of the university in matters of student recruitment, curriculum and quality assurance. Therefore, higher education institutions may, within the framework of their autonomy, recognize different outcomes of short-term training, and obtaining MOOC-based micro- credentials for teacher professional development, as well as advanced training, may be regulated by internal documents of higher education institutions (e.g., regulations).

The developed Recommendations for the implementation of micro-credentials in Ukraine are intended to promote the development of holistic approaches to the development and implementation of micro-credentials in Ukraine as part of the National Qualifications System. This should form the background for the implementation of the key provisions of the EU Council Recommendation on a European approach to micro-credentials for lifelong learning and employability. Since the national legal framework of Ukraine currently does not contain any clear substantive norms and

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regulatory procedures for social relations in the field of micro- credentials, the authors of the Framework were guided by the norms and regulatory procedures defined in the European Union acquits. It should be emphasized that this document is intended primarily for higher education institutions that can use these Guidelines to develop their own provisions for organising short-term learning, particularly in the form of massive open online courses, and recognizing the outcomes of such learning (Semigina & Rashkevych & Reznik & Stepankova, 2024). We hope that the ideas and provisions of this Framework will be useful for other providers of short- term learning outside of educational institutions.

The document also provides recommendations on the development of the political and legal framework for the introduction of micro-credentials in Ukraine, their integration into the National Qualifications Framework. The document emphasises that micro- credentials are introduced as an integral part of the National Qualifications System in order to provide formal recognition of specific skills, abilities, competences that can be acquired through short-term training. At the current stage in Ukraine, the National Qualifications System covers only full and partial qualifications, which can be educational and professional (Verkhovna Rada of Ukraine, 2017; Verkhovna Rada of Ukraine, 1971). The learning outcomes and competences required for the award of educational and/or professional and partial professional qualifications can be achieved through formal, non-formal or informal education.

Academic qualifications are awarded, recognized and validated by educational institutions or other educational entities, while vocational and partial vocational qualifications are awarded/validated and recognized by entities authorized by law, including educational entities, qualification centres and other subjects. Under Ukrainian law, full and partial professional qualifications are based on a set of job functions defined by an occupational standard. At the same time, the labor market often requires workers with a specific set of professional competences that do not formally correspond to any occupational standard. In this case, micro-credentials available in the National Qualifications System and de facto recognized by employers can solve the problem. However, several important aspects should be taken into account when including micro-credentials in the National Qualifications System. Among them are the following (Semigina & Rashkevych & Reznik & Stepankova, 2024):

- In contrast to full or partial professional qualifications, which are based on relevant occupational standards and cover several or at least one job function, micro- credentials can be developed based on a set of professional competences required by the labor market. At the same time, recognition of learning outcomes in the workplace may focus on strengthening or acquiring competencies required to perform certain work activities rather than the full range of job functions (Martinez-Marroquin & Male, 2021). Or, these micro-credentials can be developed to meet a person's personal needs. This lack of rigid linkage to education or occupational standards makes them flexible.
- In most cases, formal approvals (licences, accreditations) are not required for the development and implementation of micro-credentials, and their real value is determined by labour market demand and recognition by educational institutions as a set of learning outcomes obtained through non-formal and/or informal education.
- The inclusion of micro-credentials in the National Qualifications Framework involves the development of mechanisms for the recognition, comparison and transferability of micro-credentials between different learning contexts and workplaces. This promotes the portability of micro-credentials, allowing learners to transfer their achievements and receive recognition for their efforts.

Conclusion.

Thus, micro-credentials are introduced into the National Qualifications System with the aim of recognising specific skills, abilities, competences that can be acquired through short-term training. Micro-credentials, as a component of the National Qualifications Systems, are a response to the rapidly changing needs of the labour market and social requirements and serve as an effective tool for human capital development. And the introduction of micro-credentials as one of the components of National Qualification Systems will contribute to the development of specially organised work-based learning. This means that

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employees will be able to acquire new knowledge and skills directly in the course of performing their professional duties. This approach not only reduces training costs, but also ensures that the acquired competences are practical. The introduction of micro-credentials is a challenging area of education development that meets the needs of a dynamic world. This process requires further research and improvement, but it is already safe to say that micro-credentials have great potential to transform education and increase its accessibility, flexibility and practicality. It should be emphasized that it is the European Commission that plays a key role in promoting the integration of micro-credentials in the European Education Area. An important impetus for the development of micro-credentials was given by the Recommendation on a European approach to micro-credentials for lifelong learning and employability, adopted in 2022.

The National Qualifications System is an important tool for influencing the development of the national economy through the formation of high-quality human capital. The system can have a positive impact on the labor market, including the education system. Ukraine has sufficient resources to establish a modern qualifications system and reach the level of the countries that are leaders in these processes. The National Qualifications System should be clear and dynamic enough to ensure proper response to labor market demand, and therefore, given the conservatism of education in teacher training, it needs to be changed. That is why the concept of micro-credentials is currently considered as a necessary element of the National Qualification System and their implementation should play a significant role in the educational area. Thus, micro-credentials are an important step towards creating a modern, flexible and efficient education system in Ukraine that will meet both national and European standards.

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Implementing Microcredentials in Chemistry Learning: Methods and Pedagogy

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Abstract:

Microcredentials have emerged as an innovative approach to education, offering focused, flexible, and personalized learning experiences. In the context of chemistry education, these credentials provide a unique opportunity to bridge gaps in traditional pedagogical methods by enabling learners to acquire specific, practical competencies that align with modern scientific and industrial demands. This paper explores the integration of microcredentials into chemistry learning, emphasizing methods and pedagogy designed to foster deeper engagement, critical thinking, and real-world application.

The study outlines innovative instructional strategies, including problem-based learning (PBL), gamification, and virtual laboratories, tailored to microcredential frameworks. These methods not only enhance student motivation but also provide scalable solutions for diverse learning needs. Additionally, the role of digital platforms and assessment tools in delivering and certifying microcredentials is analyzed, highlighting best practices for ensuring credibility and alignment with academic and professional standards.

Pedagogical approaches in this context prioritize modularity, allowing learners to focus on targeted areas such as green chemistry, analytical techniques, or industrial applications. Collaboration with industry stakeholders ensures the relevance of content, while interdisciplinary integration promotes skills like scientific communication and ethical reasoning.

The implementation of microcredentials in chemistry learning demonstrates potential for transforming traditional educational paradigms, making education more inclusive, dynamic, and responsive to contemporary challenges. This paper concludes by discussing the impact of such approaches on lifelong learning, workforce readiness, and the democratization of specialized knowledge in the chemical sciences.

Keywords: Microcredentials, Chemistry education, Pedagogy, Problem-based learning (PBL), Gamification, Virtual laboratories, Modular learning, Digital platforms

Introduction

The rapid evolution of educational practices in the 21st century has led to the emergence of innovative methods that cater to the dynamic needs of learners and the workforce. Among these innovations, microcredentials have gained prominence as a flexible and focused means of skill acquisition and certification. Unlike traditional degrees, microcredentials allow learners to master specific competencies through modular and personalized approaches, making them particularly relevant in fields that demand both theoretical knowledge and practical expertise, such as chemistry.

Chemistry, as a cornerstone of scientific advancement, plays a critical role in addressing global challenges, including sustainable energy, environmental conservation, and healthcare innovation. However, traditional pedagogical approaches often struggle to adapt to the rapid advancements and interdisciplinary nature of modern chemistry. Microcredentials offer a pathway to overcome these challenges by enabling learners to engage with specialized topics, acquire targeted skills, and gain practical experience in a structured yet flexible manner.

This paper investigates the implementation of microcredentials in chemistry education, focusing on the methods and pedagogical strategies that enhance their effectiveness. By integrating innovative teaching practices such as problem-based learning (PBL), gamification, and virtual laboratories, microcredentials can provide learners with a deeper understanding of chemistry concepts while fostering critical thinking and real-world problem-solving skills. Furthermore, the collaboration with industry stakeholders ensures that the content of these microcredentials aligns with current scientific and industrial needs, making them valuable for both academic and professional growth.

The introduction of microcredentials in chemistry education has the potential to revolutionize how knowledge and skills are delivered, assessed, and recognized. This paper explores the methodologies,

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benefits, and challenges associated with this approach, offering insights into how microcredentials can transform chemistry education into a more dynamic, inclusive, and impactful field.

Chemistry Education Through Microcredentials: Transforming Learning and Skill Development

Microcredentials are reshaping the educational landscape by offering learners the opportunity to gain specific, focused skills in a modular and flexible format. In the realm of chemistry education, this approach has significant potential to address the growing demand for interdisciplinary knowledge, hands-on expertise, and real-world application. By allowing learners to specialize in niche areas such as green chemistry, analytical methods, or materials science, microcredentials create tailored pathways for skill development that align with both academic and industrial needs.

Chemistry education, traditionally structured around comprehensive and lengthy degree programs, often struggles to keep pace with rapid scientific advancements and the evolving demands of the workforce. Microcredentials bridge this gap by enabling students to gain expertise in emerging areas without the constraints of traditional curricula. For instance, learners can pursue microcredentials focusing on sustainable chemistry practices, laboratory safety, or advanced spectroscopic techniques, equipping them with relevant competencies in a shorter timeframe.

Key to the success of microcredentials in chemistry education is their integration with innovative teaching methods. Problem-based learning (PBL), virtual simulations, gamified modules, and interdisciplinary projects can enhance engagement and deepen understanding of complex concepts. Additionally, the use of digital platforms facilitates flexible delivery, making microcredentials accessible to a broader audience, including professionals seeking upskilling opportunities.

Industry collaboration further strengthens the relevance of chemistry microcredentials. By aligning learning outcomes with industry standards and involving professionals in curriculum design, microcredentials can prepare learners for immediate application of their skills in the workplace. This approach not only boosts employability but also fosters a closer connection between academia and industry.

The adoption of microcredentials in chemistry education represents a paradigm shift towards more personalized, relevant, and skill-oriented learning. This paper delves into the pedagogical strategies, technological tools, and collaborative frameworks that underpin this transformative approach, emphasizing its potential to enhance both teaching and learning in the chemical sciences.

Problem-Based Learning (PBL) as a Technique in Microcredentials

Problem-Based Learning (PBL) is a learner-centered approach that emphasizes active problem-solving and critical thinking, making it an ideal technique for delivering microcredentials in a focused and impactful manner. The integration of PBL into microcredential frameworks enhances the learning experience by engaging learners in authentic, real-world challenges that require them to apply theoretical knowledge in practical contexts.

Why PBL Suits Microcredentials:

1. **Modular and Focused Learning:** PBL aligns well with the modular structure of microcredentials, where each module or credential focuses on a specific skill or competency. Learners can tackle distinct problems related to targeted areas, such as environmental chemistry, drug design, or nanotechnology.
2. **Real-World Application:**PBL emphasizes contextual learning, helping learners connect chemistry concepts to industry-relevant problems. For instance, designing a sustainable chemical process or solving issues related to waste management provides practical experience that enhances employability.
3. **Development of Key Competencies:** Microcredentials delivered via PBL foster essential skills like teamwork, communication, and decision-making, in addition to domain-specific knowledge. These skills are critical for professional success in chemistry-related fields.
4. **Engagement and Motivation:**By allowing learners to work on meaningful, challenging problems, PBL increases motivation and engagement. Microcredentials can use PBL to simulate real laboratory scenarios, case studies, or industrial projects, keeping learners invested in their education.

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Example Implementation in Chemistry Microcredentials:

Green Chemistry Microcredential: Learners could work on a PBL project to develop an eco-friendly synthetic pathway for a chemical compound, using principles of sustainability and green chemistry.

Analytical Chemistry Microcredential: Learners might solve a real-world problem like determining the contamination levels in a water sample, requiring them to apply analytical techniques such as spectroscopy or chromatography.

Materials Science Microcredential: A PBL task could involve designing a novel material with specific properties for industrial use, integrating knowledge of polymer chemistry and material characterization.

We can mention benefits of PBL in Microcredentials like Skill Integration which combines theoretical knowledge with hands-on application, enhancing both understanding and technical expertise. **Lifelong Learning** Encourages self-directed learning and adaptability, skills vital for continuous professional development.

Also, collaboration opportunities which facilitates teamwork and collaboration, often through interdisciplinary approaches. Problems can be tailored to individual learner needs or industry-specific challenges, providing personalized and relevant experiences.

Example of PBL in Chemistry Microcredentials: "Designing a Sustainable Chemical Process"

Microcredential Title: "Green Chemistry: Principles and Applications"

Learning Objective: Learners will apply green chemistry principles to design an eco-friendly chemical process for synthesizing a widely used industrial compound, minimizing environmental impact while maximizing efficiency.

PBL Scenario:

Context: You are part of a team working for a chemical manufacturing company that produces a common solvent, **ethyl acetate**, used in paints, coatings, and adhesives. The current manufacturing process generates significant waste and consumes non-renewable resources, raising concerns about its environmental footprint.

Task: Your team has been tasked with redesigning the production process of ethyl acetate to meet the following sustainability criteria:

- **Minimize Waste:** Implement atom economy to reduce by-products.
- **Use Renewable Resources:** Explore using bio-based feedstocks.
- **Reduce Energy Consumption:** Propose energy-efficient reaction conditions.
- **Enhance Safety:** Avoid hazardous reagents and processes.

PBL Steps:

- **Problem Analysis** to understand the existing production process and to identify environmental and safety drawbacks.
- **Research and Hypothesis to i**nvestigate alternative green chemistry methods and to evaluate the feasibility of bio-based raw materials, such as ethanol derived from biomass and acetic acid from renewable sources.
- **Solution Desig by d**eveloping a proposed process, including reaction conditions (e.g., temperature, catalysts), waste minimization strategies and energy-efficient setup (e.g., microwave heating or flow chemistry).
- **Experimentation/Simulation by the u**se of a virtual laboratory platform to simulate the reaction under proposed conditions, and analyze the environmental impact using tools like **E-Factor calculations** and **life cycle assessment (LCA)**.

Fig. 1 Green Chemistry process

- **Evaluation by c**omparing the new process with the traditional method in terms of yield, cost, energy efficiency, and environmental impact.

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- **Presentation by p**reparing a professional report or presentation detailing the redesigned process, and justify your choices with data and connect them to the 12 principles of green chemistry.

Assessment: Learners will be evaluated on:

- The creativity and feasibility of their process design.
- Use of green chemistry principles.
- Ability to articulate findings through written and oral communication.
- Collaboration and problem-solving during the project.

Outcome: Learners who complete this microcredential will:

- Gain hands-on experience applying green chemistry principles.
- Develop critical thinking and problem-solving skills.
- Enhance teamwork and communication abilities.
- Obtain a digital badge showcasing their expertise in sustainable chemical processes.

This PBL task integrates theoretical knowledge, practical application, and real-world relevance, embodying the essence of microcredentials in chemistry education.

Fig. 2 Steps to green chemistry

Gamification and Virtual Laboratories in Chemistry Microcredentials

1. Gamification in Chemistry Microcredentials. Gamification is the application of game-design elements and principles in educational contexts to increase learner engagement and motivation. When integrated into chemistry microcredentials, gamification enhances the learning experience by turning abstract concepts and complex skills into interactive and enjoyable activities.

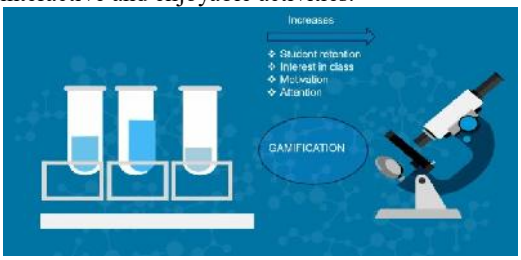

Fig. 3 Gamification elements

Key Elements of Gamification:

- **Badges and Achievements:** Learners earn badges or micro-credentials for completing tasks like mastering chemical reactions or solving environmental problems.
- **Levels and Progression:** The content is structured in levels, where learners unlock advanced topics (e.g., organic synthesis) as they complete foundational ones (e.g., bonding theories).
- **Challenges and Quests:** Learners undertake challenges such as designing a molecule with specific properties or optimizing a chemical process for sustainability.
  - **Leaderboards:** Foster friendly competition among learners, motivating them to excel.
  - **Immediate Feedback:** Instant feedback on quizzes, simulations, or problem-solving activities to reinforce learning.

Examples in Chemistry:

- **Chemical Reaction Mastery Game:** A virtual game where learners solve puzzles to balance equations, predict reaction products, or optimize reaction conditions.
- **Periodic Table Adventures:** Interactive challenges that teach periodic trends, element properties, and their applications in real-world contexts.
- **Molecule Builder:** A gamified activity where learners construct molecules to meet specific criteria, learning about molecular geometry and bonding in the process.

Benefits:

- **Engagement:** Learners are more likely to stay motivated when they see their progress visually represented.

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- **Retention:** The interactive nature helps reinforce complex concepts.
- **Personalized Learning:** Gamified systems adapt challenges to the learner's pace and skill level.

2. Virtual Laboratories in Chemistry Microcredentials

Virtual laboratories (vLabs) simulate real-world lab environments, providing learners with opportunities to conduct experiments and practice skills in a risk-free, cost-effective setting. These are particularly valuable for microcredentials, where learners focus on specific skills and need hands-on experience.

Fig. 4 Virtual laboratory interface

Features of Virtual Laboratories:

Realistic Experiment Simulations: Replicate laboratory techniques such as titrations, spectroscopy, chromatography, or organic synthesis. One of the most significant features of virtual laboratories is their ability to replicate real-world laboratory techniques. Through advanced simulations, learners can perform experiments like titrations, spectroscopy, chromatography, and organic synthesis, all within a digital environment. These simulations are designed to mimic the precision and complexity of physical lab work, providing learners with a realistic hands-on experience. For instance, students can practice balancing complex chemical reactions, measure absorption spectra using a simulated UV-Vis spectrophotometer, or separate compounds through virtual chromatography. These realistic simulations ensure that learners gain practical insights into chemical processes and develop technical skills that are directly transferable to real laboratory settings.

Data Collection and Analysis: Learners collect and interpret experimental data, mimicking real lab workflows. Another critical feature of virtual laboratories is their ability to enable learners to collect and analyze experimental data, mirroring the workflows of physical laboratories. Virtual tools allow students to observe and measure variables, record experimental outcomes, and interpret data using advanced analytical techniques. For example, during a simulated experiment on reaction kinetics, learners can record reaction rates at different temperatures and graph the results to deduce activation energies. This process not only reinforces theoretical concepts but also cultivates essential scientific skills, such as critical thinking, problem-solving, and proficiency in data interpretation. By integrating data collection and analysis into virtual labs, learners develop a comprehensive understanding of how experiments are conducted and evaluated in professional scientific settings

Safety Training: Virtual labs simulate hazardous situations, teaching safe lab practices without actual risk. Safety is a paramount concern in any chemistry lab, and virtual laboratories excel in providing an environment where learners can practice hazardous procedures without risking harm. These labs simulate potentially dangerous situations, such as handling volatile chemicals, working with high temperatures, or using pressurized systems, allowing students to learn and apply proper safety protocols. For instance, a virtual lab might simulate a spill of corrosive materials, teaching students how to respond appropriately, such as donning personal protective equipment (PPE) and following emergency procedures. This feature is invaluable in preparing learners for real-world labs by instilling safety awareness and confidence in managing risk.

Accessibility: Learners can access experiments from anywhere, reducing the need for physical lab resources. Accessibility is another cornerstone of virtual laboratories, making chemistry education available to a broader audience. Unlike physical labs that require costly equipment, specialized facilities, and on-site presence, virtual labs can be accessed from anywhere with an internet connection. This feature is particularly beneficial for learners in remote or underserved regions who may not have access to well-equipped laboratories. Additionally, virtual labs are compatible with a range of devices, from desktops to tablets, further enhancing their reach. This level of accessibility ensures that all students, regardless of geographical

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or financial constraints, can gain exposure to high-quality chemistry education.

Virtual laboratories have revolutionized the way chemistry is taught, offering innovative, scalable, and interactive methods to engage learners and equip them with essential skills. As an essential component of modern educational tools, virtual laboratories address many challenges associated with traditional lab environments while providing unique opportunities for experiential learning. This essay explores the key features of virtual laboratories—realistic experiment simulations, data collection and analysis, safety training, and accessibility—and their transformative impact on chemistry education.

There are some Examples in Chemistry:

- **Spectroscopy Simulations:** Learners use virtual instruments (IR, NMR, or UV-Vis spectrometers) to analyze chemical compounds and interpret spectra.
- **Reaction Pathways:** Experiment with different conditions (temperature, pressure, catalysts) to optimize reactions in a virtual environment.
- **Green Chemistry Scenarios:** Test sustainable chemical processes and analyze environmental impact using simulated tools.

We can use several platforms for Virtual Labs like:

- **Labster:** Offers a range of virtual chemistry lab simulations, from basic techniques to advanced applications.
- **PhET Interactive Simulations:** Provides interactive simulations for visualizing chemical processes like gas laws, atomic bonding, and reaction kinetics.
- **ChemCollective:** Hosts scenario-based virtual labs and tutorials for diverse chemistry topics.

Integrating Gamification and Virtual Labs in Chemistry Microcredentials

By combining gamification and virtual laboratories, microcredentials can provide a rich and immersive learning experience. For example:

- **Scenario:** A gamified virtual lab simulates an industrial chemical plant. Learners take on the role of process engineers, using lab simulations to optimize a reaction for maximum yield and minimum waste, earning points or badges for achieving goals.
- **Assessment:** Progress is tracked through milestones, quizzes, and challenges, offering both formative and summative evaluation.

Together, gamification and virtual laboratories make chemistry microcredentials not only engaging and flexible but also effective in equipping learners with the skills and knowledge required for modern scientific and industrial challenges.

Digital Platforms for Implementing Microcredentials (MCs) in Chemistry Education

Digital platforms are critical for designing, delivering, and managing microcredentials (MCs) effectively. They offer tools for creating modular content, facilitating interactive learning, and verifying skill acquisition through assessments and digital badges. Below are key platforms and strategies for implementing MCs in chemistry education.

Key Digital Platforms for Implementing Microcredentials

Moodle

- Open-source learning management system (LMS) that supports modular course design.
- Integration with gamification plugins and virtual lab tools.
- Digital badge capabilities for microcredential issuance.
- **Use Case:** Chemistry educators can design modular courses on topics like spectroscopy or green chemistry, integrate assessments, and issue badges upon completion.

Coursera

- Supports stackable credentials, allowing learners to progress from microcredentials to full certifications.
- Offers video content, quizzes, peer-reviewed assignments, and interactive projects.
- **Use Case:** Universities and institutions can create chemistry microcredentials focusing on cutting-edge topics like materials science or sustainable chemistry.

EdX

- MicroMasters and Professional Certificate programs for stackable credentials.
- Integration with virtual laboratories and interactive simulations.
- **Use Case:** Microcredentials on fundamental chemistry skills like reaction mechanisms or thermodynamics can be hosted with interactive lab simulations.

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Labster

- Virtual labs tailored for chemistry education, offering simulations in organic chemistry, biochemistry, and more.
- Data analytics to track learner progress.
- **Use Case:** Provides practical lab experience for learners completing a chemistry microcredential without access to physical labs.

Credly

- Platform for issuing and managing digital badges and microcredentials.
- Integration with LMS platforms like Canvas and Moodle.
- **Use Case:** Universities and organizations can use Credly to validate and showcase chemistry microcredentials earned by learners.

Kahoot!

- Gamified quizzes and learning activities for interactive assessment.
- Real-time learner engagement.
- **Use Case:** Chemistry educators can design gamified quizzes on periodic trends, reaction mechanisms, or spectroscopy as part of the assessment for microcredentials.

Steps to Implement Microcredentials Using Digital Platforms we can list:

Define Objectives and Scope: Defining clear objectives and scope is the foundational step in creating a successful microcredential program. The process begins by identifying specific skills or knowledge areas that the microcredential will cover. For instance, topics such as "Basics of Chromatography" or "Introduction to Green Chemistry" offer learners a focused, achievable goal. These topics should be chosen based on their relevance to current industry needs and emerging academic trends. By doing so, the microcredential ensures learners gain skills that are both practical and highly valued. Alignment with industry standards and academic goals is equally critical. Collaboration with industry professionals, educational experts, and accreditation bodies can help shape the microcredential's curriculum, ensuring it meets both professional and educational expectations. This alignment increases the credibility of the program and enhances learners' employability by bridging the gap between theoretical knowledge and real-world applications. Clearly defining objectives and scope provides learners with a transparent understanding of what they will achieve, laying the groundwork for meaningful, skill-focused education

Design Modular Content: Breaking down the microcredential into smaller, manageable modules is essential for creating an effective and engaging learning experience. Each module should focus on a specific topic, such as "Principles of Chromatography" or "Applications of Chromatography in Forensic Science." This modular approach allows learners to progress incrementally, mastering individual components before integrating them into broader competencies. The use of multimedia resources is another critical aspect of content design. Videos, infographics, and interactive simulations can simplify complex concepts and cater to diverse learning styles. For instance, a video demonstrating the mechanics of chromatography, paired with an infographic summarizing its key principles, provides a comprehensive learning experience. Simulations can further enhance understanding by allowing learners to practice techniques virtually, solidifying their grasp on the subject matter. Modular content design ensures that the learning process is structured, engaging, and adaptable, meeting the needs of a wide range of learners.

Integrate Gamification and Virtual Labs: Integrating gamification and virtual laboratories into microcredentials can significantly enhance learner engagement and comprehension. Platforms such as Labster or PhET offer realistic virtual lab experiences that allow learners to conduct experiments in a simulated environment. For instance, a virtual chromatography lab can enable learners to practice separating compounds without the need for physical equipment. This hands-on experience fosters practical skills while eliminating logistical barriers. Gamification further amplifies the learning experience by incorporating game-like elements such as quizzes, leaderboards, and challenges. Tools like Kahoot! or gamified modules within Moodle can motivate learners through friendly competition and instant feedback. For example, a leaderboard for mastering chromatography techniques can encourage learners to strive for better performance. By combining gamification and virtual labs, microcredentials become dynamic and interactive, ensuring learners remain motivated and gain practical, applicable skills.

Develop Assessments and Criteria: Assessments are integral to verifying that learners have achieved the objectives of a microcredential. Formative

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assessments, such as quizzes and interactive activities, provide ongoing feedback and help learners identify areas for improvement. Summative assessments, including project-based assignments and lab reports, evaluate overall competency and ensure mastery of the subject. Clear criteria for earning the microcredential are essential to maintaining its credibility. For instance, learners might need to complete all modules with a minimum score of 80% to qualify. Setting these standards ensures that the credential represents a meaningful achievement, reflecting the learner's capability and understanding. A well-designed assessment strategy not only measures learner performance but also reinforces their confidence in applying newly acquired skills in professional or academic contexts.

- Create formative and summative assessments, such as quizzes, project-based assignments, or lab reports.
- Set clear criteria for earning the microcredential (completing all modules with a minimum score of 80%).

Promote and Scale the Program: Promoting the microcredential program is essential to attract a diverse and engaged audience. Effective promotion involves identifying and targeting key demographics, such as students, professionals, and industry partners. Marketing strategies can include social media campaigns, webinars, and collaborations with industry organizations to showcase the program's relevance and benefits. Scaling the program involves creating stackable pathways, allowing learners to combine microcredentials into larger certifications or degrees. For instance, a series of microcredentials on chromatography, spectroscopy, and lab safety could lead to a "Certificate in Analytical Chemistry." This approach not only broadens the program's reach but also enhances its value by providing learners with opportunities for continuous professional development. Through strategic promotion and scalable design, microcredentials can evolve into comprehensive educational offerings that meet the needs of a global audience.

- Advertise the microcredential program to target audiences, including students, professionals, and industry partners.
- Offer stackable pathways where learners can combine microcredentials to earn larger certifications or degrees.

Conclusions

Microcredentials represent a transformative approach to chemistry education, enabling learners to acquire targeted, industry-relevant skills in a flexible and modular format. By integrating innovative methods such as problem-based learning (PBL), gamification, and virtual laboratories, these credentials bridge the gap between theoretical knowledge and practical application. The use of digital platforms further enhances their accessibility, scalability, and credibility, making them an essential tool for modern education.

The implementation of microcredentials in chemistry offers several key benefits:

- **Personalized Learning:** Modular structures allow learners to focus on specific areas of interest or need, such as green chemistry, analytical techniques, or materials science.
- **Real-World Relevance:** Collaboration with industry ensures that the skills and competencies taught align with current professional demands, enhancing employability.
- **Innovative Pedagogy:** Techniques like PBL and gamification promote engagement, critical thinking, and problem-solving, equipping learners with transferable skills.
- **Accessibility and Inclusion:** Digital platforms and virtual laboratories make high-quality education available to a global audience, including those in resource-limited settings.

Despite these advantages, the successful adoption of microcredentials in chemistry education requires careful planning. Challenges such as ensuring standardization, integrating assessments, and maintaining engagement must be addressed. Collaboration between educators, industry stakeholders, and technology providers is essential for creating meaningful and impactful microcredentials.

In conclusion, microcredentials offer a promising pathway to enhance chemistry education, meeting the evolving needs of learners and the workforce. By embracing this innovative approach, educators and institutions can empower individuals with the skills and knowledge necessary to address contemporary scientific challenges and contribute to a sustainable future.

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Enhancing Cross-Cultural Communication and Language Acquisition through Microcredentials

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Abstract

Miscommunication often stems from a misalignment of explicit and implicit meaning between the sender and receiver. While advancements in technology have increased connectivity, they have not resolved the complexities of mutual understanding. This paper explores the role of cross-cultural communication in diverse societies, emphasizing how microcredentials can serve as a strategic solution to address miscommunication and enhance both language acquisition and social identity. By integrating targeted, modular learning credentials, individuals can develop specific competencies in sociolinguistics, cultural sensitivity, and effective communication practices.

Keywords: Microcredentials, cross-cultural communication, language acquisition, miscommunication, social identity.

Introduction

The dynamics of cross-cultural communication are integral to understanding how language and cultural context interact in diverse societies. Sociolinguistics focuses on the use of language in social contexts, examining factors such as cultural background, language proficiency, and social categories. Miscommunication frequently arises when there is a gap between explicit and implicit meanings, particularly in multilingual and multicultural interactions.

Microcredentials present an innovative approach to address these challenges. By offering targeted training modules, microcredentials empower individuals to develop precise skills in areas such as cultural sensitivity, explicit communication strategies, and effective language use in professional and social contexts.

Microcredentials and Cross-Cultural Communication

Microcredentials are short, focused learning programs that validate specific skills and competencies. In the context of cross-cultural communication, they can address key areas such as:

- Explicit vs. Implicit Communication: Microcredentials can train individuals to recognize and adapt their communication style based on cultural and contextual requirements.
- Cultural Sensitivity: Learners can gain insights into cultural norms, values, and expectations to improve interpersonal and professional interactions.
- Language Acquisition: Specialized modules can help individuals enhance their second-language proficiency, focusing on practical application and cultural nuances.

By breaking down complex sociolinguistic challenges into manageable learning objectives, microcredentials make professional development more accessible and tailored to individual needs.

Core Competencies Addressed by Microcredentials

1. Understanding Context: Microcredentials in sociolinguistics teach learners to interpret and adapt to diverse social and cultural contexts. For example, modules on intercultural pragmatics can help individuals navigate implicit and explicit meanings in high-stakes scenarios.
2. Developing Explicit Communication Skills: Training programs focus on clarity in communication, reducing the likelihood of misinterpretation. These modules emphasize structuring messages for maximum comprehension, particularly in professional settings.
3. Cultural Adaptation: Learners gain tools to adjust their conversational styles based on cultural norms, ensuring respectful and effective interactions. Microcredentials also foster awareness of cultural identity and its impact on communication.

Applications of Microcredentials in Language Education

Microcredentials can enhance traditional language education by focusing on specific, actionable skills:

- Implicit vs. Explicit Communication: Learners can practice explicit phrasing to reduce ambiguity, particularly in

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professional and cross-cultural interactions.

- Conversational Forms: Modules address counterproductive conversational habits, such as dominance in discussions or misaligned listening skills, to promote more productive dialogues.
- Digital Communication: Training focuses on effective written communication to mitigate misunderstandings in email, chat, and other text-based interactions.

Case Studies and Practical Implications

Case Study 1: Cultural Clashes in Professional Settings A multinational organization implemented microcredential programs to train employees in intercultural communication. Employees reported improved understanding of cultural norms and reduced instances of miscommunication in team collaborations.
Case Study 2: Enhancing Teacher Competencies Language educators participated in a microcredential program focusing on second-language acquisition and cultural sensitivity. The program improved their ability to teach diverse student populations, incorporating explicit and implicit communication strategies effectively.

Implicit vs explicit communication

Phrasing your messages in an explicit manner prevents miscommunication. This is especially recommended in high-stake circumstances or when you don't know the other person well. If you're a service representative dealing with a new customer, for example, you'd better err on the side of explicitness
Sometimes we mean exactly what we say. *"Hand me a lemonade, please."* But sometimes our explicit message doesn't fully concur with our intention. *"Could you pass me that lemonade?" "Yes, I could,"* my friend replies, as he grabs and eats it himself.
Simple messages can be stuffed with implicitness. *"Enjoy that apple pie"* could be a neutral message. But I could also say it in a way that makes my friend feel guilty, or makes him wonder whether this particular apple pie has a special ingredient he didn't know about.
There's a tension between politeness and directness here. To make questions or commands more polite, we wrap them in indirectness. *"Give me your phone number",* turns into, *"would you mind giving me your phone number?".*

Conversational forms.

Many of our conversations take on counterproductive forms in which each side is merely out to seek status. In *"12 Rules for Life"* , Jordan B. Peterson discusses a few of such forms he encountered in his career as a psychologist and which you'll be sure to recognize.

- **The stronger story.** One person tells a good story. Instead of simply appreciating it, the other person only tries to top it. If the original storyteller returns the favor, such dialogues can quickly spin out of control to increasingly improbable storylines.
- **Waiting to make your point.** Instead of listening fully to what the other person is saying, you're just thinking about how you can jump in to make your own point.
- **Victory for the point of view.** Most discussions develop into this one. Instead of discussing to learn something new, people discuss with the sole purpose of claiming victory of the other person's point of view.

The conversational forms like these ones is that they prevent us from getting closer to understanding . If your ego is invested in your argument, you're not able to change your mind without losing your face
Misleading written forms
The message on mobile, or the chat, is another common cause of miscommunication. Verbal channels like phone or voice mail are better carriers for implicit meaning, while written channels like email or live chat are better for explicit communication.
There's an infinite number of ways to pronounce the word *"no."* In written communication the interpretation is fully left to the receiver, making miscommunication easier.

Some poor listening skills

Indeed, plenty of today's miscommunication can be blamed on the receiver's inability to focus. If you want to sharpen your listening skills, Treasure offers a few exercises to improve this one of the most 4 important skills of the language acquisition.
Julian Treasure argues that we're rapidly losing our listening skills. Our apps have thrown us in a

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constant state of distraction our headphones lock us in a private bubble.

Some cultural communication clashes

In the past ten years, several book-length studies and anthologies have been published that adopt a discourse approach to cross-cultural communication. The traditional practice of referring to one participant in an interaction as "native" and the other as "non-native" has been symptomatic of the way in which a bilingual's linguistic performance is viewed as problematic as and less acceptable than the native interlocutor. In recent years, however, there has been greater emphasis on cross-cultural communication as an accomplishment of both parties in a conversation and on a bi-directional interpretation of communication difficulties that takes both interlocutors' perspectives into account

More recently, however, a number of studies of communication strategies have examined the use of strategies to attain pragmatic or relational goals. In keeping with this approach, many of the studies reviewed here focus not on the communication of referential meaning but on interpersonal dynamics, the presentation of self, the multiple functions of a situated utterance, and the ways in which intersubjectivity is jointly constructed through interaction. As mentioned above, the dominant research methodology in the analysis of cross-cultural communication has been hermeneutic and qualitative.

The qualitative studies have generally shown that the communication of referential information in cross-cultural communication is not as problematic as might be believed.

Cross-cultural miscommunication may have negative social consequences for the bilingual participant, particularly in gate-keeping encounters where a native speaker controls the non-native speaker's access to some desired outcome. For instance, Albanians interviewees often respond minimally to questions posed by the interviewer. In contrast, Americans speaking Albanian sometimes fail to acknowledge the interviewer's higher status and provide more information than is required, a style that results in a low assessment of their proficiency in Albanian.

In the context of widespread racial and economic discrimination, cross- cultural miscommunication can have serious and damaging social consequences. The increasing hostility between individuals, as each side's negative judgment of the other's communicative style confirms and reinforces their initial prejudices.

Several researchers, however, have criticized explanations of cross- cultural miscommunication that rely solely on the different preferred cultural values and conversational styles prevalent in the two cultures. The critics point out that, in modem societies, individuals' identities are complex and fluid, ideologies about a particular group may influence individuals to be tolerant or intolerant of communication difficulties, and there is a great deal of diversity and conflict within any one culture.

Misinterpretation due to poor speaking skills

Similarly, oftentime's miscommunication can be blamed on poor speaking skills. Some people express themselves so incoherently that they're near impossible to follow.

One powerful communication tip is to speak with structure – for example by using a *what - so what - now what* approach. Start talking about the what. Then about why it's relevant. Then what the next steps should be.

Different mental models

The above causes of miscommunication are about an actual misinterpretation of the explicit/implicit meaning of the message. But a larger type of miscommunication exists – one in which people are actually talking about the same things, but *differ on what these things mean*.

Such misunderstanding derives from differing mental models.

It'd be nice if we'd all see the world the same way. But we don't. In *"What? Did you really say what I think I heard?"* Sharon Morgan explains that our brains delete, misconstrue and misinterpret according to filters–biases, triggers, assumptions, beliefs, habits and mental models.

There's actually an ongoing epistemological debate between intelligent people over whether objective reality even exists. We won't reach a conclusion here, but that fact alone underlines the weight of mental models.

Conclusion

Microcredentials provide a strategic solution to enhance cross-cultural communication and language acquisition. By offering targeted, modular training, they address the nuances of

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sociolinguistics and cultural dynamics, empowering individuals to navigate complex communication landscapes effectively. The integration of microcredentials into educational and professional development frameworks holds significant promise for fostering mutual understanding and collaboration in diverse societies.

Sociolinguistics, coupled with microcredentialing, offers a unique opportunity to bridge gaps in communication and build competencies that are essential for thriving in an interconnected world. As the demand for cross-cultural competence grows, microcredentials represent a scalable and practical approach to meet these needs.

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Using Micro-credentials in Mathematics Education.

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Abstract

The use of micro-credentials in mathematics education offers an innovative and effective approach to the professional development of math teachers. Micro-credentials are focused and flexible certifications that help teachers improve specific skills in advanced mathematics and contemporary teaching methods. These short programs are often available online, providing easy access for teachers with various commitments. In the context of Albania, micro-credentials can contribute to the modernization of the education system by enabling math teachers to adopt international practices, integrate technology into the classroom, and enhance student outcomes. A study on the impact of micro-credentials on math teachers in Albania could explore the effectiveness of these programs in developing professional skills and increasing their confidence in using new teaching methods. The study could focus on assessing the benefits of micro-credentials for improving teaching practices and their influence on student performance. This would help identify the specific needs of math teachers and how micro-credentials can address these challenges more effectively.

Keywords: Micro-credentials, education, teaching, data analysis, statistics.

1. Introduction

Field theories on the use of micro-credentials in mathematics teacher education. The use of micro-credentials in the mathematics education of mathematics teachers can be understood through several theories of the field that focus on professional development, the learning process and the improvement of teaching practices. Here are some important theories related to this topic:

1.1. Theory of Meaningful Learning.

This theory suggests that learning is an active process, where individuals construct knowledge based on their experiences and prior knowledge. Mathematics teachers, pursuing micro-credentials, can create new learning experiences and reflect on their practices. Hollis, L. (2022). Micro-credentials can provide opportunities for teachers to experiment with new strategies and develop a deeper understanding of new teaching methods through practical application.

1.2. Adaptive Learning Theory.

This theory focuses on the need to personalize the learning process for each individual, based on their experiences and needs. Micro-credentials provide opportunities for personalized skill development that matches the specific needs of teachers. Teachers can choose micro-credentials that focus on their specific teaching challenges, helping them increase the effectiveness and quality of teaching mathematics. Learning Forward (2019).

1.3. Narrative Learning Theory.

This theory emphasizes the importance of stories and personal experiences in the learning process. Mathematics teachers who share their experiences and reflection on teaching practices while pursuing micro-credentials can create a stronger professional community. Teachers can use online platforms to share their stories and learn from each other, helping to develop a collaborative culture. Darling-Hammond, L., & Bransford, J. (2022).

1.4. Reflective Practice Theory

This theory suggests that reflection on teaching experiences is essential for professional growth. Micro-credentials encourage teachers to reflect on new learning and its benefits for their professional development. Teachers can use reflection logs after completing the micro-credential to assess how their teaching practices have changed and the impact on students. Darling-Hammond, L., & Bransford, J. (2005).

1.5. Sustainable Professional Development Theory

This theory focuses on the importance of continuous professional development for teachers, ensuring that they have opportunities to learn and evolve. Micro-credentials provide a convenient and ongoing approach to professional development. K. H. Allred (2020)

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By pursuing micro-credentials, mathematics teachers can keep their level of knowledge and skills in line with changes and new developments in the field of education and mathematics. A. M. Houghton (2021).

1.6. Differentiated Instruction Theory

This theory suggests that teachers should adapt their teaching to meet the different needs of students. Micro-credentials can help teachers develop different strategies to respond to the different needs of students in the classroom. Teachers can learn how to create different lessons for students with different knowledge and skill levels. Zheng, C. & Ma, Y. (2021).
These field theories provide a deep understanding of how micro-credentials can influence the professional development of mathematics teachers. Using micro-credentials helps teachers improve their teaching practices, increase student engagement, and contribute to the modernization of mathematics education.

2. Study Methodology for the Use of Micro-Credentials in Mathematics Teacher Education

To investigate the effectiveness and impact of micro-credentials in mathematics teacher education, a well-structured methodology is necessary. Here are some possible steps and approaches that could be included in the study methodology:

2.1. Purpose of the Study

The main purpose of the study is to examine how micro-credentials influence the professional development of mathematics teachers and their effects on teaching practices and student outcomes.
Hypothesis: Micro-credentials improve teachers' skills, increase their confidence in using new teaching methods and positively affect student performance.

2.2. Care of the Study Population

Participants: Selection of a group of mathematics teachers from different schools (eg, elementary and middle schools) who have pursued micro-credentialing. These teachers are in DAR Vlore

Number of Participants: A sufficient sample to ensure diverse representation, approximately 42 teachers.

2.3. Study Design

Qualitative Study: Using interviews and focus groups to gather information about teachers' experiences with micro-credentials and their impact on instructional practices.
Quantitative Study: Using surveys to collect statistical data on teacher knowledge before and after pursuing micro-credentials and the impact on student performance.

2.4. Research Instruments

Surveys: Create a survey that includes questions about:

- Teachers' experiences with micro-credentials.
- Changes in teaching practices.
- Assessment of confidence in the use of new methods.
- Student performance.

Qualitative Data Collection: Conducting focus groups to gather information about teachers' experiences and opinions about micro-credentials. These focus groups were held in two groups with 5 and 6 teachers.

2.5. Interpretation of Results

Summary of Findings: Discussion of the results in relation to the hypotheses and aims of the study.
Relevance for Practice: Assessing the impact of micro-credentials on teacher professional development and improving instructional practices.
This methodology will help create a deeper understanding of the effects of micro-credentials in mathematics education and contribute to improving teaching practices in the future.

3. Data analysis

Male Participation: 64.29% of participants are male, making this the dominant group in the study. This may suggest a tendency to include more males in the field of mathematics teaching, perhaps due to culture or societal traditions.
Female Participation: 35.71% of participants are female. This number is lower than that of men, reflecting an opportunity to increase the representation of women in studies related to

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teaching mathematics. This may indicate that women may face greater challenges entering this field, or that there may be social and cultural factors influencing their career choices.
The analysis of participants by gender provides a valuable perspective on their representation in the study of micro-credentials in mathematics education. This will help inform future practice to ensure that all teachers, regardless of gender, have equal opportunities to develop their skills and contribute to the education of student.

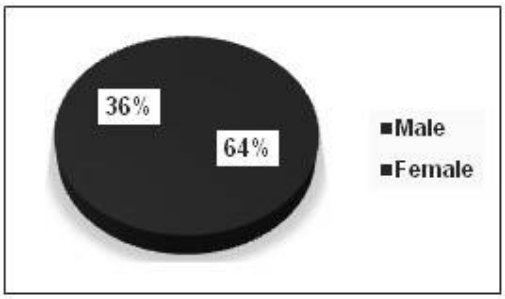

Fig.1: Gender

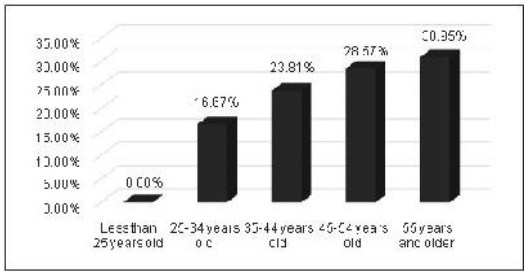

Fig.2: Age

3.1. Analysis of Age of Study Participants.

- Young Participants (Less than 25): There are no young teachers (under 25). This indicates that the pool of young teachers is underrepresented, which may mean that young individuals may face challenges entering the mathematics teaching profession or that the profession may be more popular with older individuals.
- Age group 25-34 years: The smallest part of the participants (16.67%) represents this age group. This group may include new teachers who are in the early stages of their career and may face certain challenges in developing their teaching practices.
- Age group 35-44 years: This group makes up 23.81% of the total, showing a visible presence of teachers in this age group, who probably have several years of experience and may have developed different teaching approaches.
- Age group 45-54 years: This group constitutes 28.57% of the participants, indicating that teachers in this age category are the most numerous and probably have considerable experience and deep knowledge of teaching.
- Age group 55 years and older: This group makes up 30.95% of participants, indicating that there is a high representation of teachers who are on the verge of retirement, but who can bring great experience and knowledge to the classroom.

3.2. Analysis of the Teaching Experience of Study Participants

- Less than 2 years: Only 7.14% of participants have less than 2 years of experience. This number shows that many young teachers are engaged, but their representation is low. This may suggest that teaching as a profession attracts more experienced individuals or that those who are newer to the profession face challenges staying in it.
- 2-5 years: This group constitutes 19.05% of the total, indicating that a significant number of teachers are in the early stages of their career. They may need further support and training to develop their teaching practices.
- 6-10 years: Participants in this group make up 30.95% of participants, indicating that they have a medium level of experience. These teachers are often at a stage where they have developed certain skills but still have opportunities for professional growth and development.

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- More than 10 years: This group constitutes 42.86% of the participants, indicating that teachers with great experience are present and can contribute their knowledge and experiences. This shows a high level of commitment in the teaching profession.

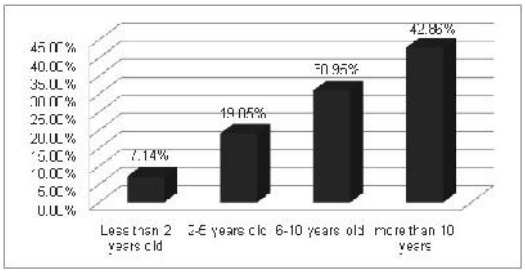

Fig.3: Teaching Experience

Analysis of teaching experience provides important insight into the representation of different levels of experience in the classroom. This will help create strategies for support and professional development for all teachers, ensuring they are equipped with the knowledge and skills needed to be effective in teaching.

3.3. Analysis of the Number of Micro-Credentials Pursued by Participants

- Participants who have pursued a micro-credential (42.86%): This group is a significant percentage and suggests that many teachers are beginning to engage in their professional development, but may not be sure that they should pursue more.
- Participants who have pursued two micro-credentials (28.57%): These teachers are committed to advancing their knowledge and skills, showing a desire to improve teaching practices.
- Participants who have pursued three or more micro-credentials (28.57%): This group shows a high commitment to their professional development and may have benefited greatly from ongoing training.

Analysis of the number of micro-credentials pursued shows a general commitment of teachers to professional development. However, there are opportunities to encourage more participants to follow different courses, providing opportunities and support to achieve better teaching results.

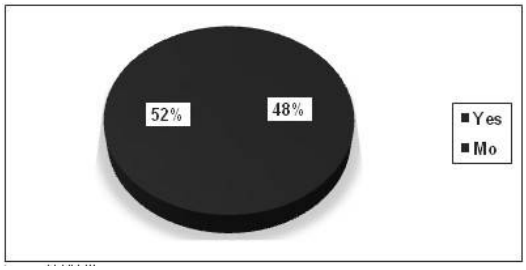

Fig.4: Have you pursued any micro-credentials in mathematics?

3.4. Quality Analysis of Micro-Credentials Pursued by Teachers.

- Quality of Micro-Credentials: 53.85% of participants (10 + 18) rated the quality as "very high" or "high," suggesting an overall satisfaction and positive evaluation of the micro-credentials they attended.
- Verage Participant: With 14 teachers rating the quality as "average," this indicates that there is room for improvement. Some teachers may have expected more from the programs offered.
- Absence of Negative Ratings: A positive aspect of the results is the absence of "low" and "very low" ratings. This suggests that no teachers are dissatisfied with the quality of the micro-credentials they have attended.
- The results of the quality assessment of micro-credentials show a high satisfaction among teachers for the programs attended, however, there is always room for improvement. Continuous commitment to professional development and training quality will contribute to a better and more successful education for students.
- Also, the results of the question show that a significant majority of teachers have put into practice the teaching techniques they learned during the micro-credentials, showing the positive impact of these trainings on their practice. This is a strong sign of teachers' commitment to improve the quality of teaching and contribute to achieving better results for students.

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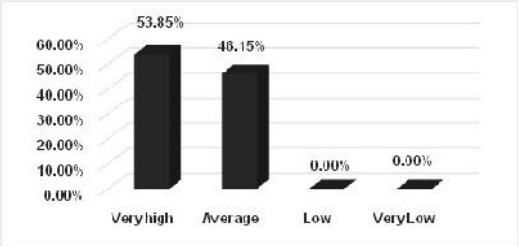

Fig.5: How do you rate the quality of the micro-credentials you have attended?

3.5. Analysis of the Application of Teaching Techniques and Their Impact on the Teaching Proces.

Active Learning: Using interactive methods that engage students, such as group work, discussions and hands-on activities.
Use of Technology: Integration of technological tools, such as apps to learn math, short videos for practical examples, or platforms for online learning.
Active Learning: Using interactive methods that engage students, such as group work, discussions and hands-on activities.
Use of Technology: Integration of technological tools, such as apps to learn math, short videos for practical examples, or platforms for online learning.
The implementation of different teaching techniques by teachers has brought positive impacts on the teaching process. It helps increase student engagement and performance and creates a more conducive environment for learning. Teachers should continue to explore and apply these techniques, while training providers should provide ongoing support for them.
A high percentage of teachers (about 87.80%) feel either very confident or confident in using new teaching methods, indicating that micro-credentials have helped to increase their confidence in these techniques.
Only 12.20% of teachers rate reliability as "averagely reliable." This may indicate that some teachers still feel unsure about using the new methods, perhaps due to a lack of experience or support in implementation.

3.6. Analysis of Open Questions for Challenges and Recommendations carried out with the focus group.

Teachers may face a number of challenges in pursuing micro-credentials, which may include:
Lack of Time: Many teachers may feel overwhelmed with other teaching duties and may struggle to find time to take micro-credential courses.
Course Content: Some teachers may feel that course content is not sufficient to meet their or their students' needs, seeking more advanced or personalized content.
Lack of Support: Teachers may face a lack of technical support or mentoring during the learning process, making it more difficult for them to implement new methods.
Difficulty in Implementing New Techniques: Some teachers may have difficulty implementing new techniques in the classroom due to various factors, such as the age of the students, classroom dynamics, or limited resources.

Recommendations for improving micro-credentials may include:

Providing Hands-on Training: Creating opportunities for hands-on training and group work that allow teachers to practice new techniques and help each other.
Ongoing Support: Providing mentoring and technical support during and after completion of the micro-credential to ensure teachers feel confident in using new methods.
Improving Course Content: Reviewing and improving the content of the micro-credential to ensure that it is relevant and appropriate to the needs of teachers and students.
Flexibility in Time and Structure: Offering different options for the duration and structure of courses to fit teachers' busy schedules.
The open questions that were carried out in the focus groups provide a valuable opportunity for teachers to share their experiences, challenges and recommendations for micro-credentials in mathematics education. This information is important to improve future training programs and maximize benefits for teachers and their students.

4. Conclusions

1. Improving the Quality of Teaching: The study has shown that teachers who have pursued micro-credentialing experience a significant improvement

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in the quality of their teaching. A large part of the participants (about 90.48%) rated the impact of micro-credentials as "very positive" or "positive" on student performance. This supports the hypothesis that micro-credentials contribute to improving teaching practices.

2. Increasing Reliability in New Methods: Teachers reported a high confidence in using new teaching methods after pursuing the micro-credential. About 87.80% of them feel either "very confident" or "confident", suggesting that the training has increased their confidence in implementing new techniques.

3. Challenges in the Implementation of Micro-credentials: Despite the benefits, the study identified some common challenges, such as lack of time, difficulties in implementing new techniques, and lack of support. These challenges can affect the effectiveness of micro-credentials and suggest that additional support is needed.

5. Recommendations

1. Providing Additional Support: The use of mentors and technical support during and after pursuing micro-credentials is essential to help teachers successfully implement new methods.

2. Improvement of Course Content: Review and improve the content of the micro-credential to ensure that it is appropriate and necessary for the current needs of teachers and students.

3. Flexibility in Time and Structure: Providing more flexible options for the duration and structure of courses can help ease the workload for teachers and encourage participation.

4. Encouraging Cooperation and Help Among Teachers: Creating opportunities for teachers to help each other and share their experiences to increase the sense of community and support in the implementation process.

5. Impact Monitoring: Implementing a system to monitor the impact of micro-credentials on student and teacher performance will help identify areas for improvement and justify investments in these trainings.

This study confirms that micro-credentials have a significant impact on improving teaching practices and student performance, but also identifies the need for ongoing support and improvements. Implementing the above recommendations can help maximize the benefits of micro-credentials and create a more effective teaching and learning environment.

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12. *Attend conferences such as the American Educational Research Association (AERA) and International Society for Technology in Education (ISTE), which often feature discussions and presentations on micro-credentials in education.*