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DEVELOPING ENTREPRENEURIAL COMPETENCE IN FUTURE TEACHERS: SMART COACH MODEL EXPERIENCE

Abstract

This article explores the practical implementation of the *Smart Coach* model as an effective strategy for fostering entrepreneurial competence among future primary school teachers in Kazakhstan. Utilizing a mixed-methods approach combining surveys, interviews, and observational data, the study demonstrates how this innovative extracurricular initiative cultivates core entrepreneurial skills such as leadership, critical thinking, problem-solving, and innovation. Positioned within the context of global educational trends, the research addresses the disconnect between policy-driven expectations and the realities of teacher training in higher education. The article also investigates the broader pedagogical implications of integrating entrepreneurial education, financial literacy, and business-innovation strategies into teacher preparation curricula. Special attention is given to the practical application of student-led projects, which offer scalable and sustainable pathways for reform in profession-oriented institutions. A key outcome of this initiative is the establishment of the *Smart Coach* club at Abai Kazakh National Pedagogical University.

Keywords: entrepreneurial competence, teacher education, business-innovation, Smart Coach model, innovation, future teachers.

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БОЛАШАҚ МҰҒАЛІМДЕРДІҢ КӘСІПКЕРЛІК ҚҰЗЫРЕТТІЛІГІН ДАМУ: SMART COACH МОДЕЛІ НЕГІЗІНДЕГІ ТӘЖІРИБЕ

Аңдатпа

Бұл мақалада Қазақстандағы болашақ бастауыш сынып мұғалімдерінің кәсіпкерлік құзыреттілігін дамытуға бағытталған *Smart Coach* моделінің практикалық қолданылуы стратегиялық тәсіл ретінде қарастырылады. Сауалнама, сұхбат және сабақ барысындағы бақылауларды қамтитын аралас әдіснама негізінде жүргізілген зерттеу - инновациялық сыныптан тыс платформаның көшбасшылық, мәселелерді шешу, креативтілік және бейімделу сияқты негізгі кәсіпкерлік дағдылардың дамыту жолдарын көрсетеді. Модель мұғалімдерді даярлаудағы жаһандық үрдістер аясында қарастырылады және ұлттық білім саясаты мен педагогикалық даярлық арасындағы алшақтықты еңсеруге бағытталған. Мақалада кәсіпкерлік оқыту, қаржылық сауаттылық, бизнес-инновациялық стратегиялар және жобалық оқытуды педагогикалық оқу бағдарламаларына енгізудің жүйелік маңыздылығы талданады. Сонымен қатар, қазіргі білім беру талаптарына сай келетін, ауқымды және кәсіби бағытталған реформалардың қажеттілігі атап өтіледі. Бұл модельдің орталық құрамдас бөлігі – Абай атындағы Қазақ ұлттық педагогикалық университеті жанынан құрылған *Smart Coach* клубы. Клуб болашақ мұғалімдер үшін сарапшылар өткізетін семинарларға, бизнес өкілдерімен серіктестікке және өз стартаптарын жүзеге асыру мүмкіндіктеріне қол жеткізетін белсенді орта болып табылады.

Түйін сөздер: кәсіпкерлік құзыреттілік, болашақ мұғалімдер, бизнес-инновация, Smart Coach моделі, білім берудегі инновациялар, мұғалімдерді кәсіби даярлау.

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РАЗВИТИЕ ПРЕДПРИНИМАТЕЛЬСКОЙ КОМПЕТЕНТНОСТИ БУДУЩИХ УЧИТЕЛЕЙ: ОПЫТ НА ОСНОВЕ МОДЕЛИ SMART COACH

Аннотация

В статье рассматривается практическая реализация модели *Smart Coach* как стратегического подхода к формированию предпринимательской компетентности у будущих учителей начальных классов в Казахстане. Основанное на смешанном методологическом подходе — включая опросы, интервью и наблюдения за учебными занятиями — исследование показывает, как эта инновационная внеучебная платформа развивает ключевые предпринимательские навыки, такие как лидерство, решение проблем, креативность и адаптивность. Модель рассматривается в контексте глобальных тенденций в подготовке педагогов и решает проблему разрыва между национальной образовательной

политикой и реальной подготовкой учителей. Далее в статье подчеркивается системная значимость интеграции предпринимательского обучения, финансовой грамотности, бизнес-инновационных стратегий и проектного подхода в педагогические учебные программы. Отмечается необходимость масштабируемых и профессионально-ориентированных реформ в высшем образовании, соответствующих современным требованиям. Центральным элементом модели является клуб *SmartCoach*, созданный на базе Казахского национального педагогического университета имени Абая. Клуб служит активной средой для будущих педагогов, предоставляя доступ к семинарам с участием экспертов, взаимодействию с представителями бизнеса и возможностям реализации собственных стартапов.

Ключевые слова: предпринимательская компетентность, будущие учителя, бизнес-инновация, модель *Smart Coach*, образовательные инновации, подготовка педагогов.

Introduction. The role of the modern educator is expanding in response to the demands of the 21st-century knowledge economy. Teachers are increasingly expected not only to convey curriculum content but also to foster critical thinking, digital fluency, and entrepreneurial spirit in their students. Entrepreneurship in education is now recognized globally as a key competency for both learners and educators (Lackéus, 2015). International policy frameworks such as the OECD Future of Education and Skills 2030 project and the European Union’s *EntreComp Framework* have redefined the role of the teacher to include leadership, adaptability, and creativity as essential characteristics. In this regard, entrepreneurial competence is no longer exclusive to the business sector but is emerging as a crucial element in teaching and learning.

Entrepreneurial education encourages individuals to take initiative, work collaboratively, and manage uncertainty. These competencies are invaluable in classrooms where teachers must respond flexibly to diverse learning needs, technological change, and administrative responsibilities. In Kazakhstan, educational reform initiatives such as the National Development Plan to 2025 and the Concept for the Development of Education 2021–2025 emphasize modernization, innovation, and digital transformation. Several local researchers emphasize the importance of linking education with innovation and entrepreneurship, particularly in Kazakhstan’s reform agenda (Sadykova&Zhumagulova,2022). However, despite these initiatives, teacher education curricula remain predominantly theoretical. Scopus-indexed studies (Yessimbetova, 2021) have identified a significant gap in the practical preparation of Kazakhstani teachers for real-world entrepreneurial challenges. The urgency of incorporating entrepreneurial training is supported by international best practices. According to Fernández-Laviada (2023), the integration of entrepreneurial education in teacher training leads to greater adaptability and promotes lifelong learning competencies, which are essential for sustainable educational reform.

This study introduces the *Smart Coach* model as a response to this gap. Conceived as a business-innovation club for future teachers, *Smart Coach* engages students in workshops, mentoring, and project-based learning. It offers a space for experimentation, collaboration, and self-directed learning—hallmarks of entrepreneurial development. The program’s value lies not only in its outcomes but in its process: it empowers students to take initiative, solve real-world problems, and reflect critically on their professional identities.

Basic provisions. Entrepreneurial competence encompasses a constellation of attitudes, knowledge, and skills that enable individuals to create value for others. The *EntreComp Framework* (Bacigalupo et al., 2016) defines entrepreneurship across three key areas: *Ideas and Opportunities, Resources, and Into Action*. For educators, this includes the ability to design innovative learning environments, secure teaching resources, and act autonomously within institutional constraints.

Several scholars (Fayolle&Gailly, 2008; Lackéus, 2015) argue that entrepreneurial competence is best developed through experiential learning that involves risk, reflection, and real-life challenges. This aligns with Kolb’s (1984) theory of experiential learning, where learning is constructed through concrete experience and reflective observation. Gibb (2005) advocates for an “entrepreneurial university” model in which institutions become laboratories of innovation rather than factories of content delivery. This shift is mirrored in teacher education by calls to infuse entrepreneurship into pedagogy (Deveci&Seikkula-Leino, 2018).

Recent reviews emphasize that teacher training increasingly includes entrepreneurship to build adaptable and proactive professionals (Almeida & Simoes, 2023). Mitra (2020) emphasizes ethical dimensions of entrepreneurship education, which are subtly addressed in Smart Coach through reflective journaling and peer feedback. In the post-Soviet context, entrepreneurial education is also recognized for its role in fostering creativity among students (Averina, 2020).

In the Central Asian context, research by Lama et al. (2021) and Sternberg and Bergmann (2024) underscores the growing interest in entrepreneurial pathways in education, particularly for improving employability and aligning training with labor market needs. However, localized models of entrepreneurial teacher education remain underdeveloped. The Smart Coach model contributes to this emerging discourse by offering a case study from Kazakhstan.

Comparative Perspectives on Entrepreneurial Models. Internationally, Finland's "Me & MyCity" model introduces students to entrepreneurship through city simulation, while Singapore's Ministry of Education integrates innovation training into teacher preparation. In contrast to these state-supported models, Smart Coach functions as a grassroots initiative led by practicing educators. Its flexibility, low-cost structure, and alignment with the EntreComp framework offer valuable lessons for countries with similar transitional economies. Unlike traditional simulation-based models used in Kazakhstan (Akhmetova & Ilyassova, 2022), Smart Coach emphasizes real-life mentorship and project development.

Research Objectives and Questions. The primary objective of this study is to evaluate the effectiveness of the *Smart Coach* model in developing entrepreneurial competencies among future primary school teachers. The study aims to:

- Assess the development of key entrepreneurial skills—such as leadership, creativity, decision-making, and innovation—among program participants;
- Identify which specific components of the Smart Coach model contribute most significantly to competence development;
- Explore the perceptions and lived experiences of student-teachers as they engage with entrepreneurship education.

To address these aims, the research seeks to answer the following questions:

- In what ways does participation in the Smart Coach model influence the entrepreneurial competencies of teacher education students?
- Which program components are perceived by participants as most impactful in their professional growth?
- How can this model be effectively scaled or integrated into formal teacher education programs?

Materials and Methods. The study was conducted from September 2023 to May 2024 at Abai Kazakh National Pedagogical University, specifically within the Institute of Pedagogy and Psychology. Participants were undergraduate students enrolled in the “6B013003 – Primary Education with Business Innovation” academic program. A *mixed-methods research design* was employed to provide both depth and breadth of analysis. This approach allowed for a comprehensive investigation into the development of entrepreneurial competencies among future primary school teachers. The study involved 41 undergraduate students, 89% of whom were female. The survey was distributed electronically using Google Forms, and participation was entirely voluntary. Prior to data collection, formal ethical approval was obtained from the university administration to conduct the study and use the resulting data for academic purposes. *Data collection methods:*

• *Quantitative methods:*

A pre- and post-intervention survey using Likert-scale items was administered to assess changes in five key entrepreneurial competencies: financial literacy decision-making, creative thinking, leadership, innovation in education.

The data were analyzed using *SPSS*, applying *paired t-tests* to determine statistically significant changes in scores.

• *Qualitative methods:*

- Weekly reflective journals were collected throughout the program;
- Two focus group discussions were conducted (mid-point and final);
- In-depth interviews were held with 10 purposively selected students.

These qualitative materials were subjected to *thematic coding* to identify common patterns and key insights.

• *Observational methods:*

Facilitators maintained detailed session logs and reviewed video recordings of program activities to assess student engagement, initiative, and collaboration.

Program description: The *Smart Coach* program spanned 12 weeks and integrated theoretical learning with hands-on activities. Each session followed a structured format: warm-up discussion, theory input, group case work, and reflection. Key session topics included: “Marketing for Educators”, “Design Thinking in Pedagogy”, “Budgeting Basics”. Students also received mentorship from local entrepreneurs and experienced educators. Group challenges involved the development of education-related startup ideas, culminating in a final *pitch competition* evaluated by external experts.

Data Analysis:

• *Quantitative data* were analyzed using the *SPSS* statistical software. A *paired t-test* was used to compare pre- and post-program competency scores.

• *Qualitative data* were analyzed using *thematic coding*, allowing the identification of emerging themes related to students’ perceptions, growth, and the overall impact of the program.

Results and Discussion. Survey findings demonstrated statistically significant improvements in all five competencies, particularly in creative thinking ($p < 0.001$) and leadership ($p < 0.005$). The average increase across skills ranged from +0.9 to +1.5 on a 5-point scale. (Figure 1-2)

Competence	Pre-Score	Post-Score	Increase
Financial Literacy	3.2	4.4	+1.2
Creative Thinking	3.0	4.5	+1.5
Leadership	2.9	4.2	+1.3
Decision-Making	3.1	4.3	+1.2
Innovation in Education	3.0	4.4	+1.4

Figure 1: Average Change in Competency Scores

Qualitative themes included:

- Transformation in professional identity
- Increased risk tolerance and autonomy
- Peer learning and collaboration
-

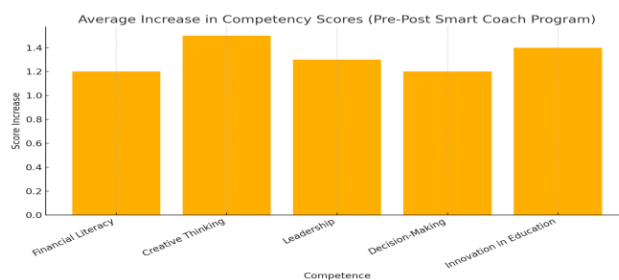


Figure 2: Average Increase in Competency Scores

The self-assessment results for the *Entrepreneurial Thinking* competency reveal a strong positive trend among participants of the Smart Coach program. Out of 41 respondents, the vast majority rated their development in this area as either 4 or 5 on a 5-point scale. This indicates a high level of satisfaction and perceived growth in entrepreneurial mindset, including creativity, initiative, opportunity recognition, and value creation. (Figure 3)

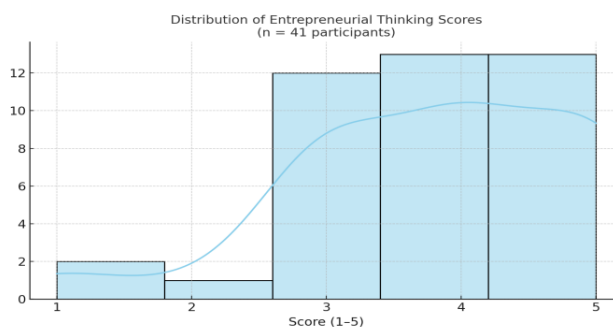


Figure 3. Entrepreneurial thinking rates

The histogram shows a distribution skewed toward the higher end of the scale, suggesting that participants strongly identified with the entrepreneurial aspects of the training. This is a notable achievement, given that many of the students had not previously been exposed to formal entrepreneurship education. The Smart Coach model’s emphasis on practical tasks—such as developing business ideas, presenting project pitches, and receiving feedback—likely contributed to this sense of confidence and growth.

Students’ feedback:

“I realized that being a teacher doesn’t mean repeating others—it means creating your own solutions.”

“For the first time, I saw myself as capable of launching something beyond the classroom.” “I used to fear presenting ideas. Now I pitch with confidence.”

“Thanks to the ‘Smart Coach’ business-innovation club, I realized how meaningful implementing a business project is for my personal growth. I will now strive to launch my own project.”

Overall, the Entrepreneurial Thinking component appears to be one of the most successful outcomes of the Smart Coach program. These results reinforce the program’s value in fostering key entrepreneurial attitudes within teacher education and suggest strong potential for scaling similar initiatives.

The Smart Coach model's success lies in its experiential, student-driven approach. Unlike traditional coursework, it provides authentic challenges that require students to negotiate uncertainty, collaborate, and apply knowledge creatively. This aligns with global findings on the benefits of entrepreneurial education in fostering adaptive expertise (Sitaridis&Kitsios, 2024).

The program also fostered non-cognitive traits such as resilience, self-efficacy, and a growth mindset. These outcomes are critical not only for entrepreneurship but for effective teaching in diverse and evolving classrooms. The integration of mentorship proved particularly influential, confirming research that role models accelerate competence development (Cárdenas Gutiérrez & Díaz de Alda, 2023).

While the Smart Coach initiative has demonstrated promise, its long-term sustainability and institutional integration require deeper consideration. According to a Scopus-indexed study by Dilli and Westerhuis (2022), entrepreneurial programs in higher education often fail due to lack of institutional alignment, faculty readiness, and unclear administrative support. In the Kazakhstani context, similar barriers exist - such as the absence of dedicated innovation units within pedagogical faculties and minimal cross-disciplinary collaboration.

Institutional readiness can be enhanced through professional development programs for educators in entrepreneurial pedagogy, the inclusion of entrepreneurship indicators in teacher education accreditation standards, and stronger collaboration with national business incubators and education-focused NGOs. Moreover, sustainability must be built through recurring funding models, student ownership of activities, and integration of student-led initiatives into formal curricula, similar to practices observed in the University of Tartu and the University of Eastern Finland.

While the Smart Coach model yielded demonstrable benefits for the professional development of future teachers, its implementation also brought forward several challenges that are crucial for understanding its applicability and scalability. First and foremost was the issue of time management. As students were already overloaded with coursework, finding time for extracurricular innovation sessions was initially difficult. This challenge was addressed by offering flexible scheduling, hybrid formats, and credit-based incentives, aligning with Gibb's (2005) recommendation that innovation should not compete with core academic responsibilities but complement them.

Secondly, there was the matter of mentor availability and diversity. While the inclusion of experienced entrepreneurs was beneficial, maintaining regular mentor involvement proved challenging due to scheduling and compensation limitations. This highlighted the need for creating a formalized mentor pool, possibly with university or business incubator affiliation, and including peer-to-peer mentoring as a supplementary layer.

Another challenge involved varying baseline competencies among students. Some participants had prior exposure to business or leadership roles (e.g., student councils, tutoring businesses), while others were starting from scratch. This discrepancy required adaptive session design—offering tiered tasks and opportunities for peer support. The variation also reinforced the idea that entrepreneurial training must be differentiated, as noted by Sitaridis&Kitsios (2024), to avoid alienating those less experienced while still challenging advanced learners.

Feedback collected mid-program revealed another insight: while students appreciated the hands-on approach, many felt overwhelmed during pitch competitions. This led facilitators to embed soft skills training earlier in the process, such as handling feedback, public speaking, and managing stress. These changes significantly improved student confidence in later sessions. Interestingly, this echoed the findings of Mitra (2020) on the importance of addressing affective dimensions of entrepreneurship, not just technical skills.

Beyond individual skill acquisition, the Smart Coach model began to influence institutional practices. For example, after the program's pilot phase, university departments expressed interest in adapting the framework for STEM and humanities students, not just those in education. This cross-disciplinary potential opens avenues for a multi-faculty entrepreneurship initiative. Similar institutional diffusion was observed in Singapore's teacher education system, where entrepreneurial modules are now mandatory across all faculties (Almeida & Simoes, 2023).

Moreover, some students who completed the program began integrating entrepreneurial thinking into their student teaching placements. In addition, several original student-led initiatives emerged: *Paratime*, a comic book series designed to promote ethical thinking and decision-making in children; *Ai-Qadam*, an interactive website and app aimed at enhancing primary school learners' digital literacy and creativity; and *Zholdas*, an educational toy prototype that supports inclusive learning for schoolchildren. These initiatives showcased not only transfer of competence but also student agency in reshaping pedagogical norms. It reflects what Kolb (1984) describes as “transformative application” of experiential learning—when knowledge constructed in one context is successfully transferred to another.

Given that the cohort was 89% female, the Smart Coach model unintentionally offered insights into gender and entrepreneurship in teacher education. Entrepreneurship literature often underscores underrepresentation of women in business fields, yet education faculties are predominantly female. This paradox positions teacher education as a strategic entry point to develop female entrepreneurial leadership.

Interviews with female participants revealed narratives of increased self-efficacy and ownership. Many admitted they had never seen themselves as “entrepreneurial” before but now felt more confident in initiating projects and expressing ideas. This shift is supported by Cárdenas Gutiérrez & Díaz de Alda (2023), who note that identity reconstruction is a core outcome of meaningful entrepreneurial education.

Additionally, some students reported that their families became more supportive once they saw tangible outputs like presentations or small business models. This community validation effect could be

strategically amplified by involving parents or local schools in future iterations of Smart Coach exhibitions.

EntreComp Mapping: The Smart Coach program addressed multiple EntreComp areas:

Ideas & Opportunities: Developing startup ideas in education

Resources: Time and resource planning, networking

Into Action: Leading projects, pitching solutions, making decisions

The development of both digital and entrepreneurial competencies is now seen as integral to modern teacher profiles (Yessenova&Smagulova, 2023).

Limitations and Future Research: Limitations include the self-selected nature of participants and the absence of a control group. Additionally, the short timeframe may not capture long-term effects. Future studies should explore longitudinal impacts, gender dynamics, and implementation across multiple universities. Exploring hybrid models (online + offline) and integrating Smart Coach into formal curriculum modules also offers potential.

Practical and Policy Implications. The Smart Coach model presents several practical and policy-oriented implications that can inform both curriculum development and systemic reform in teacher education across Central Asia. The model demonstrates that entrepreneurial competence can be effectively fostered through flexible, low-cost, and scalable strategies.

On the *practical level*, the program offers replicable components that can be integrated into existing teacher education frameworks:

- Short-format, practice-based modules can complement formal curricula without requiring a full program redesign;
- Mentorship opportunities can be embedded through partnerships with local entrepreneurs and education professionals;
- Established competence frameworks such as *EntreComp* can be utilized to structure content and assess learning outcomes.

These approaches are particularly valuable for countries in Central Asia seeking to modernize teacher training while maintaining alignment with national education standards.

From a *policy perspective*, several key recommendations emerge to institutionalize entrepreneurial education in teacher preparation programs:

- Incorporate entrepreneurship modules into all teacher education curricula as part of a broader push toward 21st-century competencies;
- Provide targeted professional development opportunities for faculty to adopt entrepreneurial pedagogies;
- Allocate funding to support extracurricular innovation clubs and seed grants for student-led entrepreneurial initiatives;
- Align teacher competency standards with global frameworks that emphasize creativity, leadership, and adaptability.

Given the positive outcomes demonstrated by the Smart Coach model, there is strong potential for *regional adaptation*. For example, countries like *Uzbekistan* and *Kyrgyzstan*, which are actively reforming their teacher education systems, could benefit from implementing modular versions of the program. A comparative study by Tashkenbaeva and Moldobekov (2023) highlights a growing emphasis on “local entrepreneurial ecosystems” in teacher education across the region. Modular adaptations of Smart Coach—comprising workshops, digital assignments, and pitch sessions—offer scalable solutions for resource-constrained institutions. Furthermore, *cross-border collaborations* through mechanisms such as *Erasmus+* or *World Bank education grants* could accelerate the diffusion of this model, facilitating innovation and capacity-building within and beyond national contexts.

Conclusion. The development of entrepreneurial competence is a strategic imperative for modern education systems. The Smart Coach model aligns closely with Sustainable Development Goal 4 (SDG 4): “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.” In particular, Target 4.4 emphasizes increasing the number of youth and adults who possess relevant skills, including entrepreneurial capabilities, for employment and entrepreneurship. By

embedding entrepreneurial thinking into teacher education, the Smart Coach program enhances both the quality and relevance of training for future educators in Kazakhstan.

As highlighted in the 2023 UNESCO Global Education Monitoring Report, programs that foster entrepreneurial mindsets among teachers are more likely to catalyze innovation in schools and adapt curricula to the evolving needs of local communities. In this context, Smart Coach can be regarded not only as a local initiative but also as a meaningful contribution to Kazakhstan's national education strategy and its global commitments under the UN 2030 Agenda.

Furthermore, the Smart Coach model illustrates how targeted, experiential programs can effectively equip future teachers with the mindset and competencies necessary to navigate complexity and drive educational innovation. The findings suggest that such initiatives not only develop individual entrepreneurial skills but also foster institutional transformation. By encouraging student-led innovation, facilitating real-world application, and incorporating flexible mentorship structures, Smart Coach exemplifies the priorities of contemporary education systems.

As policymakers continue efforts to align national education systems with SDG 4 and prepare youth for dynamic labor markets, entrepreneurship education must be recognized as a core component of teacher training. Future research should examine the long-term professional trajectories of program participants, the influence of entrepreneurial training on classroom practices, and the scalability of the model across different contexts and disciplines.

Ultimately, as Kazakhstan and other nations pursue ambitious education reforms, the integration of programs like Smart Coach offers a promising path toward cultivating agile, empowered, and entrepreneurial educators. Beyond competence development, Smart Coach embodies a philosophical shift—redefining the role of teachers as proactive agents of change capable of ideating, leading, and collaborating across traditional boundaries. By embedding entrepreneurial thinking into the core of teacher preparation, the model contributes not only to individual growth but also to systemic innovation in education. It represents a sustainable, locally grounded solution with the potential for global impact. One of the important tasks of our country's education system is to raise the level of professional training of future teachers to an international level by introducing innovative teaching technologies. In accordance with modern requirements, it is not enough to be just a primary school teacher; a teacher must be an initiator of innovation in both education and business.

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ЦИФРЛЫҚ ТЕХНОЛОГИЯЛАРДЫ ҚОЛДАНА ОТЫРЫП, БОЛАШАҚ ПЕДАГОГ-ПСИХОЛОГТАРДЫҢ МЕТАҚҰЗЫРЕТТІЛІКТЕРІН ҚАЛЫПТАСТЫРУ

Аңдатпа

Мақалада педагог-психологтардың кәсіби дайындығында цифрлық технологияларды қолдану арқылы метақұзыреттіліктерді қалыптастырудың маңыздылығы қарастырылады. Мета-құзыреттер жоғары тұжырымдамалық деңгейді білдіреді және жан-жақты кәсіби құзыреттер ретінде қарастырылады. Зерттеу мақсаты: педагог-психолог үшін метақұзыреттіліктерді қалыптастырудың маңыздылығын теориялық талдау және цифрлық технологияларды қолдану арқылы педагог-психологтардың кәсіби метақұзыреттіліктерін қалыптастырудың педагогикалық жағдайларын зерттеуді эксперименттік зерттеу.

Зерттеу әдістері: тестілеу, сауалнама, бақылау. Әдістемелер: сыни тұрғыдан ойлау тесті; өзін-өзі реттеу шкаласы; Карпов рефлексиясын анықтау шкаласы; DigCompEdu тесті (цифрлық құзыреттілікті анықтауға); SWOT-талдау (құзыреттілікті интеграциялау); оқыту аналитикасы (белсенділік динамикасы).

Зерттеу нәтижелері: жалпы метақұзыреттіліктер мен цифрлық құзыреттілікке теориялық талдау жүргізілді. Болашақ педагог-психологтың метақұзыреттіліктерді кәсіби қызметінде қалай пайдалана алатыны анықталды. Болашақ педагог-психологтардың цифрлық тұтырудың қалыптасу деңгейлері эксперименталды түрде анықталды. Метақұзыреттіліктің келесі компоненттері анықталды: когнитивті; реттеуші, коммуникативті, цифрлық және интерактивті. Ғылыми-практикалық маңыздылығы: болашақ педагог-психологтарда метақұзыреттіліктерді дамыту құралы ретінде цифрлық технологияларды қолданудың тиімділігі расталды.

Түйін сөздер: мета-құзыреттіліктер, педагог-психологтар, цифрлық технологиялар, цифрлық білім беру ортасы, метақұзыреттілік компоненттері.