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## **Development of pedagogical competencies for future primary school teachers through distance learning**

**Galiya Otyنشina\*, Raifa Dusembinova, Svetlana Odintsova, Kulzhan Aidarbekova, Bayan Shaushekova**

Karaganda Buketov University, Republic of Kazakhstan

\*Corresponding Author: [ga\\_otynshina@sacad.com.de](mailto:ga_otynshina@sacad.com.de)

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### **ABSTRACT**

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This work aims to identify effective means of distance learning methods for developing pedagogical competence among student-teachers. To achieve this goal, the study applies various methods and approaches, including dialectical and functional methods, alongside analysis and synthesis, pedagogical observation, comparison, and classification. The research employed these methodologies to analyze existing literature and explore best practices in distance learning for teacher training. The research yielded significant theoretical and practical contributions. The theoretical foundation strengthens the understanding of how distance learning can foster pedagogical competence. The practical value lies in its potential application as both instructional and methodological material for training future teachers. It can also serve as a tool for practicing educators to improve their skills by familiarizing them with effective distance learning tools and strategies. Future research should explore the evolution of distance learning methods in teacher training, identify potential shortcomings of distance learning approaches, and propose effective solutions to overcome these limitations.

**Keywords:** educational process, students, quarantine, professional training, educators

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## **INTRODUCTION**

Explorations in the field of pedagogy have taken a prominent place in modern educational discourse. This is particularly true as the role of educators, especially primary school teachers, is crucial for society (Wangid et al., 2020; Widodo et al., 2017). Consequently, training these educators is a complex and ongoing process that necessitates continuous skill development, potentially through retraining. As far as primary school teachers are concerned, they require not only professional knowledge but also essential skills like openness to innovation and modernizing the learning environment. On this basis, it should be emphasized that pedagogical competence consists of several important elements, including not only professional knowledge but also specific skills and approaches to the educational process. Notably, current primary school curricula possess unique characteristics and objectives that influence teaching activities. These objectives include the need to develop and strengthen essential student capabilities, such as the ability to analyze and interpret various events, actions, and phenomena, as well as to adapt to specific conditions, both in educational settings and everyday life (Diachkova, 2020).

Primary school teachers deserve particular attention due to their critical role as the starting point for students' education. The effectiveness and dynamics of student learning in higher grades depend on this foundation. Furthermore, modern curricula are undergoing continuous

modernization, which necessitates elevating the professional competence of future primary teachers within relevant higher education institutions (Trust & Whalen, 2020).

The implementation of quarantine restrictions due to the global spread of COVID-19 has prompted the implementation of quarantine restrictions. This, in turn, triggered a shift to distance learning in educational institutions. This change, however, has led to several obstacles and contradictions, often stemming from the inadequate level of competence of teachers. This is why training programs and courses that equip future teachers with diverse pedagogical and technological competencies are becoming increasingly important (Gonçalves et al., 2020).

The rapid shift to distance learning during the pandemic exposed several challenges in pedagogical education. These challenges include limited awareness among student-teachers of modern learning programs and digital tools, a lack of motivation by teachers to adopt new technologies, and insufficient access to computers and digital equipment for both students and teachers. To address these issues and improve the training of future primary teachers, higher education institutions need to actively incorporate various distance learning tools into the curriculum. By equipping student-teachers with these skills, they will be prepared to effectively utilize them in their future classrooms (Davis et al., 2021)

To address these challenges of distance learning, this article aims to study available distance learning tools for developing the pedagogical competence of future primary school teachers. It will also assess their effectiveness and impact on the whole process of education and its modernization. The study's key inquiries include defining key theoretical concepts related to this topic, identifying their characteristics, analyzing current challenges and limitations associated with distance learning, and evaluating the most effective methods for training future primary school teachers (Pennington et al., 2020).

## **METHOD**

The research was conducted at Karaganda Buketov University during the 2021-2022 academic year. In considering the subject, it is established that it is sufficiently broad in its content while remaining well-defined. The topic explored the training of primary school teachers, including methods and organization of distance learning. The article employed a comprehensive range of methodological tools to comprehensively examine all relevant aspects of this topic.

The research employed a functional approach, which proved instrumental in guiding this study. This approach does not only establish clear objectives for the study, but also provides a structured research plan as it segments the research process into distinct stages. This strategic division allowed for a more thorough examination of each element within the study, ensuring a comprehensive investigation of the topic.

The research also benefited from a dialectical approach, which shaped the article's logical structure. This involved progressing from general to specific theoretical concepts. The analysis began with foundational theoretical definitions, such as distance learning and pedagogical competence, and the methods for developing the latter. Subsequently, the article explored common forms and tools used in distance learning for training future teachers.

The article incorporated both theoretical and empirical research methods. Analysis and synthesis were employed to deconstruct the central research question into its key components. This facilitated a thorough examination of each element within the broader topic. In turn, synthesis allowed for the integration of these components, revealing their interconnections and highlighting the study's central features.

Pedagogical research methods played a central role in exploring the educational process in a distance learning format. It aims to identify the unique characteristics of distance learning and integrate them into training for future primary school teachers. Additionally, pedagogical research facilitated the identification of significant differences between various learning forms and their impact on educator competence. To determine the most effective and rational approaches for developing future teachers' pedagogical competence in a distance learning environment, a comparative method was employed. This allowed for a systematic evaluation of various methods and the incorporation of key distance learning features into the training program of future primary

school teachers.

Finally, the research also employed a classification method to categorize existing methods for developing pedagogical competence based on their suitability for a distance learning environment. The study unfolded in several stages. In the first stage, the purpose and objectives of the research were established. Additionally, key terms and their characteristics relevant to the topic were explored. The second stage involved analyzing existing tools and approaches for developing pedagogical competence and their effectiveness and practicality in a distance learning context. This stage also included reviewing international experiences and highlighting key recommendations. The third stage focused on examining the research results and drawing concise conclusions. Empirical data was gathered through personal experience and observation during professional activities at Karaganda Buketov University. Ten university teachers participated in the study, analyzing the obtained data using expert evaluation methods. All participants were informed about the research and provided their consent.

## **FINDING AND DISCUSSION**

### **Finding**

Effectively preparing future primary school teachers for the demands of distance learning requires a comprehensive approach that integrates both theoretical and practical aspects. The first step involves closely examining the fundamental concepts of pedagogical competence. This analysis provides the foundation for identifying the current tools colleges and universities use to develop these essential skills and knowledge in their students. In the context of training future primary school teachers, pedagogical competence refers to the interconnected process of building and strengthening a core set of knowledge and abilities. This targeted training equips them to handle the challenges of traditional classrooms and the ever-changing world of distance learning. Ultimately, this comprehensive approach aims to ensure that future educators possess the necessary skills to fulfil their professional duties and responsibilities effectively in any teaching environment.

It is important to highlight that future teachers acquire essential functionalities necessary for their role through this training. To some extent, these functionalities become their responsibilities, and their effective execution ensures a successful educational process. They include: planning and implementing educational and methodological plans; organizing and delivering the educational process; conducting educational activities; fostering student development within the educational environment and the family setting; creating a smooth and high-quality learning environment; and developing students' self-assessment and self-control skills. Furthermore, a qualified educator needs to engage in various pedagogical studies for self-development and to modernize the educational process. Additionally, class teachers function by providing timely professional assistance to other educators, particularly in areas related to teaching, development, upbringing, and integration of primary school students into society. A key outcome of developing pedagogical competence in future teachers is consolidating responsibility for reflection and generalization of gained professional experience. This gained knowledge is then appropriately applied to enhance learning communities' educational process and development. Analyzing these points, we can establish that equipping teachers with these functionalities and ensuring their effective execution allows them not only to qualitatively assess student performance but also to influence their further educational development, while simultaneously improving their own professional qualities.

As for the notion of the professional competence for a primary school teacher, this study focuses on a dynamic and modernized personality characteristic. This characteristic reflects the level of vocational education, experience, and individual professional skills. Additionally, this concept should encompass the teacher's desire for continuous self-education and self-development, evident in professional development activities and the implementation of effective communication strategies during the educational process. Finally, an analysis of the teacher's professional knowledge and skills, along with their creative approach to the profession, allows us to determine their level of acquired pedagogical competence (Kirschner & Surma, 2020).

Additionally, it is necessary to address another equally important element in developing

pedagogical competence, i.e. the concept of pedagogical practice. This refers to a specific form of teaching fundamental to teacher training in higher education. Significantly, this practice typically aims to develop essential skills among student-teachers, including knowledge of the laws and fundamentals related to professional pedagogical activity and the ability to utilize specific remote methods and tools for its implementation. As a result, this process transforms these individuals into professional and competent specialists.

Furthermore, it is necessary to establish that pedagogical practice offers several promising opportunities for students pursuing pedagogical careers. These opportunities include integrating theoretical materials from various academic disciplines into a cohesive and interconnected professional skills and knowledge structure. In addition, this practice equips future teachers with diverse upgraded approaches and tools, including remote-based methods for organizing high-quality and continuous learning experiences. This learning environment fosters continuous self-development and reflection for both educators and students. An important feature of modern training and the formation of pedagogical competence among student-teachers is their multifaceted direction. This includes collaboration with students, other educational and social workers within the institution, and the parental community, all aiming to balance their common interests. After all, a student-teacher who successfully completes the process of pedagogical competence development in a higher education institution will be able to effectively and smoothly select appropriate educational materials and approaches. This selection will consider children's age and other individual characteristics, and the socio-psychological properties of the specific community served (Saidova, 2022).

For future primary school teachers, it is particularly important during training to acquire professional knowledge and skills and apply them through practical exercises that hone their abilities. As a rule, in higher pedagogical institutions, pedagogical practice involves conducting trial and credit lessons, providing student-teachers with opportunities to use their acquired knowledge and practice self-evaluation to identify and address their mistakes within the educational process. The educational community recognizes the classroom, and by extension, the entire educational environment, as an interconnected creative activity between educators and students, fostering a collaborative environment that can spark various forms of creation. This approach to preparing future primary teachers will empower them to develop the educational system and process, moving away from rigid templates. Acquiring pedagogical competence involves students developing essential and universally applicable professional skills they can utilize in the classroom to instruct students. However, during these joint activities with children, the teacher should also adapt these skills, incorporating originality into the process.

Building on this foundation, it can be established that integrating educational and creative approaches within the educational process benefits teachers and students. In addition, based on the preceding classification of concepts and their properties, it can be concluded that the successful development of pedagogical competence in student teachers, and consequently the level of their professional knowledge and skills, depends on several key factors. For example, these factors include accessibility of resources during studies at the higher pedagogical institution; the ability to perform specific tasks and navigate practical situations; the level of satisfaction with the educational process and future career prospects; the quality of work completed during training and practice sessions; the degree of self-control and self-organization demonstrated in assessments and tests; and the ability to build positive relationships with children and other educators (Cartabia et al., 2021).

Examining the general theoretical aspects of this issue allows a comprehensive understanding of key concepts like pedagogical competence, pedagogical practice, and pedagogical and professional training. This analysis reveals their core properties and features impacting future professional activity for student-teachers. The concept of training student-educators for primary schools revolves around an interconnected process designed to develop essential pedagogical skills and knowledge. This preparation aims to produce modern primary teachers who excel in traditional and distance learning environments. Educators are responsible for planning and implementing educational plans, fostering student development, and ensuring a high-quality learning environment. Additionally, conducting pedagogical research is crucial for

their self-improvement and modernization of the educational process. As the subject of this study, the professional competence of a primary school teacher can be described as a dynamic and modernized characteristic reflecting their level of professional education, experience, and individual skills. It also encompasses the teacher's desire for continuous self-education and development, evident in professional advancement activities and the implementation of effective communication strategies during the teaching process. For aspiring primary school teachers, training is not just about acquiring professional knowledge and skills. It is crucial to apply them through practical exercises that refine their expertise. Typically, in higher pedagogical institutions, pedagogical practice involves preparing, organizing, and conducting trial and credit lessons. This approach allows student-teachers to utilize their acquired knowledge in practice, self-evaluate, and ultimately identify and address their mistakes within the learning process.

## **Discussion**

Concerning the practical analysis of the topic under study, it is necessary to consider several specific external factors that have demonstrably affected the educational process and the educational environment in general.

The rapid and dynamic spread of COVID-19 has led to the modification of several established principles and approaches across public life, including the educational sphere. This space faced several new, pressing challenges, prompting widespread innovation in educational institutions of all forms and types. The main requirement for teachers was a mandatory shift to distance or blended learning, which introduced obstacles and shortcomings that hindered the effectiveness of the educational process. Material and human resources emerged as key challenges for the educational environment. Most educators were not provided with sufficient level of specialized knowledge and skills to comfortably utilize online tools for conducting lessons and additional classes (Garzón et al., 2020).

For this reason, it can be established that distance learning presents several new and specific conditions that require changes in the way future primary school teachers are trained. This way, distance learning tools receive increased focus, ensuring learning remains relevant to society's contemporary context. Additionally, it should be noted that the distance learning process introduces unique features impacting both teacher training and the practical application of their skills. Among these features demanding special attention are psychological processes, particularly understanding and interpreting common human qualities. Self-isolation, arising from distance learning, creates a new psychological structure that significantly impacts students, especially at the primary level. The growing emphasis is on attracting and utilizing pedagogical technologies that enable a smooth transition to distance learning (Ochilov, 2020).

Correspondingly, this toolkit should include various problem-solving materials and tasks designed to encourage student project implementation. Through these projects, the teacher can objectively assess student performance and hold consultations. In such conditions, a differentiated learning approach is undoubtedly the leading strategy. This approach integrates students' individual characteristics with the established curriculum, enabling them to acquire high-level knowledge (Yaroshenko et al., 2019).

It is also necessary to pay attention to examining possible transition methods to distance learning to choose the most effective approach for a particular institution. Typically, two options exist for organizing instruction under these conditions: synchronous and asynchronous. Both options utilize similar tools and resources. The main difference lies in how teachers deliver learning materials and receive student feedback and assignments. Synchronous learning is time-bound and interactive, adhering to a specific schedule. Conversely, asynchronous learning allows students to submit completed work at their convenience within set deadlines. There are no live classes; students work independently on the provided materials (Gurmu, 2020).

Various effective, modernized platforms and tools now exist for organizing instruction and fostering a favorable communication space between educators and students. These tools can be categorized based on features important for selection, including availability for real-time teacher communication, file-sharing capabilities, diverse educational material publishing options, and student progress monitoring. Additionally, the ability to disseminate information to a wide range

of people, online events for specific communities, and curriculum development and adaptation are valuable. These tools can fully support independent student work and dedicated educator instruction as a distinct learning mode (Gilar-Corbí et al., 2020).

The author argues that utilizing distance learning tools in training future primary school teachers will not only effectively organize their education but also allow them to actively integrate these tools into their daily educational activities. This will familiarize them with the algorithms of these programs and upgraded tools, enabling them to confidently apply them in their future professional careers. Thus, we can concur that effective development of the educational sphere, particularly teacher training, is achievable through this approach. Consequently, this strategy tackles the central current challenge faced by most educational institutions during the implementation of distance learning: outdated staff lacking relevant knowledge and skills. Among the primary tools suitable for remote educational activities are Google Classroom, Microsoft Teams, Cisco Webex, Zoom, Class Dojo, Classtime, Moodle, Skype, and Youtube (Limone & Toto, 2021).

Distance learning tools can also encompass online courses and video lessons available on various platforms. These resources are generally more open to the public, making them free for students and teachers. This approach is a high priority for developing pedagogical competence in student-teachers. It allows them to explore curriculum subjects and additional, specialized areas. Mastering these areas can significantly impact their knowledge and qualifications for future professional activities (Isaqovna, 2020).

It is worth noting that higher education institutions frequently organize online conferences, workshops, and webinars during remote learning, further enriching the distance learning toolkit. These events can be classified as distance learning tools as they provide platforms for student-teachers to exchange knowledge and skills and pursue self-improvement across various domains. Actively incorporating this approach into future teachers' professional and pedagogical training equips them to understand the organization and conduct of such events. As a result, they can replicate them independently in their professional activities, fostering a modernized educational process and environment (Sayfiddinovich, 2021).

Particular attention should be paid to how teaching practices are organized and conducted for future primary school teachers, as these sessions are crucial for determining their professional preparedness. The implementation of these practices can be achieved through an online format, specifically via video lessons. Students can attend these lessons and even partially organize and conduct them themselves. In this case, applications such as Zoom or Classtime are particularly suitable as they allow for real-time video communication with students while also enabling the presentation of screens with presentations or videos, a feature especially relevant for primary school education (Dovbnya et al., 2021).

Developing pedagogical competence also necessitates courses that cultivate student-teachers ability to utilize various computer, multimedia, and digital tools and applications. Fortunately, these skills are achievable through the aforementioned distance learning tools. This underscores the importance for student-teachers and future primary educators to possess a high level of pedagogical expertise and knowledge of information and communication technologies (ICT). These areas are among the most dynamic within educational technology. Additionally, a crucial quality for a modern teacher is the ability to organize and implement a blended learning model, integrating traditional classroom instruction with online sessions. In both scenarios, teachers will only be well-prepared for their professional endeavors if distance learning tools are actively incorporated into their training (Capurso et al., 2020).

Concerning interactive tools, the prevalence of these tools in distance learning is undeniable, with training sessions heavily reliant on them. The heightened inclination towards these tools stems from their beneficial attributes, such as enhanced student comprehension and retention, a richer learning experience, and seamless integration into remote settings. Consequently, the educational environment is undergoing dynamic development and modernization. Many educators are acquiring the skills necessary to utilize specialized programs in today's highly developed information society. Training for future primary school teachers typically incorporates software like Teach Infinity Pro and Intech IWB, along with various

specialized applications and platforms found on the global internet and social networks such as YouTube, Telegram, and Viber (Spiteri, 2020).

Distance learning tools offer a unique foundation for developing pedagogical competence in future primary school teachers. This versatility allows for their application across various aspects of their future educational and professional activities. For instance, video conferencing, forums, chats, blogs, and various platforms can be used for student teachers to publish educational materials and even conduct virtual lessons directly with students. In addition, diverse services and websites enable effective assessment of student knowledge, identification of errors, and the creation of personalized learning programs based on these results. Ultimately, these tools foster the development of the educational space by facilitating the exchange of professional experiences among teachers and supporting activities that enhance their teaching skills (Amirova et al., 2020).

Research by Uaidullakzy (2021) demonstrates a positive correlation between distance learning and the professional competence of primary school teachers. The study concludes that distance education fosters positive outcomes for primary school teachers' professional competency and development. This is confirmed by the present findings, as distance learning tools equip primary school teachers with the resources to stay current and develop professionally.

Ho et al. (2023) addressed the knowledge gap in traditional teacher training by developing the web-based program T.E.A.C.H. This program aimed to enhance pre-service teachers' psychological and pedagogical competencies for conducting online learning and teaching (L&T). The study's findings reinforce the notion that teachers are inherently driven to improve their skillsets. Therefore, the professional aptitude of a primary school educator, the focus of this research, can be characterized as a dynamic and contemporary attribute encompassing their educational background, experience, and unique abilities.

Ibda et al. (2023) are convinced that elementary school teachers must possess both professional and digital skills, particularly in the context of Industry 4.0 and Society 5.0. This notion aligns perfectly with the present study. The importance of digital learning for primary school teachers is underscored by several key factors. As technology pervades daily life, primary school teachers must be well-versed in digital tools to seamlessly integrate them into their pedagogy. The future classroom is envisioned as increasingly digital. To prepare students for a technology-driven world, teachers themselves require a strong foundation in the latest digital tools and methodologies. Digital learning offers inherent flexibility. In unforeseen circumstances, like a global pandemic, teaching can transition online with minimal disruption. Furthermore, digital tools can cater to diverse learning styles, enabling personalized learning paths.

## **CONCLUSION**

The study yielded pivotal findings, which can be categorized into distinct sections for further analysis. The theoretical section initially focused on elucidating vital terms, establishing a solid foundation for understanding the study's core subject. Pedagogical competence emerges as a cohesive internal framework for a teacher's professional engagement, integrating specialized knowledge and skills with creative, psychological, and particularly interactive abilities. Vocational and pedagogical training for prospective primary school educators is identified as an intertwined process that cultivates and strengthens the specialized competency of student-teachers, enabling them to seamlessly, efficiently, and effectively fulfill their roles and responsibilities. Furthermore, the global surge of the pandemic necessitated the adoption of a remote learning paradigm. This shift exposed challenges primarily stemming from teachers' limited proficiency with digital teaching tools. Integrating distance learning tools into student-teacher training equips them to leverage these tools skillfully in their pedagogical practices and subsequent teaching careers. The study identified powerful tools for fostering pedagogical competence within a remote learning context, including Google Classroom, Microsoft Teams, Cisco Webex, Zoom, ClassDojo, Classtime, Moodle, Skype, and YouTube. Systematic integration of these platforms can facilitate instruction, knowledge assessment, practical exercises, and ultimately, academic growth. Continued exploration in this domain should aim to

identify inherent limitations of distance learning tools and propose effective rectification strategies.

## REFERENCES

- Amirova, A., Elmira, U., Iskakovna, J. M., Nurmakhanovna, Z. T., & Zakaryanovna, T. G. (2020). Creative and research competence as a factor of professional training of future teachers: Perspective of learning technology. *World Journal on Educational Technology: Current Issues*, 12(4), 278–289.
- Capurso, V., Crescentini, C., D'Antoni, F., Fabbro, A., & Fabbro, F. (2020). Effects of mindfulness training on school teachers' self-reported personality traits as well as stress and burnout levels. *Perceptual and Motor Skills*, 127(3), 515–532. <https://doi.org/10.1177/0031512520908708>.
- Cartabia, M., Scarpellini, F., & Segre, G. (2021). Distance learning in Italian primary and middle school children during the COVID-19 pandemic: a national survey. *BMC Public Health*, 21, 1035-1040. <https://doi.org/10.1186/s12889-021-11026-x>.
- Davis, C. R., Grooms, J., Ortega, A., Rubalcaba, J. A. A., & Vargas, E. (2021). Distance learning and parental mental health during COVID-19. *Educational Researcher*, 50(1), 61–64. <https://doi.org/10.3102/0013189X20978806>.
- Diachkova, A. V. (2020). Organizational and managerial solutions for online (distance) interaction in the educational process at the school. *Perspektivy Nauki i Obrazovania*, 5(47), 429-439. DOI: 10.32744/pse.2020.5.30.
- Dovbnaya, S., Filonenko, L., Groshovenko, O., Gurevych, R., Kalenskyi, A., Maksymchuk, B., & Melnyk, N. (2021). The establishment and development of professional training for preschool teachers in Western European countries. *Revista Romaneasca Pentru Educatie Multidimensionala*, 13(1), 208-233. <https://doi.org/10.18662/rrem/13.1/369>.
- Garzón, A. E., Gómez, G. G., Marín, J. A., Martínez, T. S., & Ortega, M. L. (2020). Teacher training in lifelong learning—The importance of digital Competence in the encouragement of teaching innovation. *Sustainability*, 12(7), 28-52. <https://doi.org/10.3390/su12072852>.
- Gilar-Corbí, R., Izquierdo, A., & Pozo-Rico, T. (2020). Teacher training can make a difference: tools to overcome the impact of COVID-19 on primary schools: An experimental study. *International Journal of Environmental Research and Public Health*, 17(22), 86-93. <https://doi.org/10.3390/ijerph17228633>.
- Gonçalves, S. P., Pereira, F. S., & Sousa, M. J. (2020). Distance learning perceptions from higher education students—The case of Portugal. *Education Sciences*, 10(12), 374-377. <https://doi.org/10.3390/educsci10120374>.
- Gurmu, T. G. (2020). Primary school principals in Ethiopia: Selection and preparation. *Educational Management Administration & Leadership*, 48(4), 651–681. <https://doi.org/10.1177/1741143219836673>.
- Ho, H. C., Poon, K. T., Chan, K. K. S., Cheung, S. K., Datu, J. A. D., & Tse, C. Y. A. (2023). Promoting preservice teachers' psychological and pedagogical competencies for online learning and teaching: The TEACH program. *Computers & Education*, 195, 104725. <https://doi.org/10.1016/j.compedu.2023.104725>.
- Ibda, H., Syamsi, I., & Rukiyati, R. (2023). Professional elementary teachers in the digital era: A systematic. *International Journal of Evaluation and Research in Education*, 12(1), 459-467. <http://doi.org/10.11591/ijere.v12i1.23565>.
- Isaqovna, K. Z. (2020). Preparing future primary school teachers to work in a developing, person-centered education system. *International Journal on Integrated Education*, 3(12), 196-199. <https://doi.org/10.17605/ijie.v3i12.977>



- Kirschner, P. A., & Surma, T. (2020). Virtual special issue computers in human behavior technology enhanced distance learning should not forget how learning happens. *Computers in Human Behavior*, 110, 106-190. DOI: 10.1016/j.chb.2020.106390.
- Limone, P., & Toto, G. A. (2021). From resistance to digital technologies in the context of the reaction to distance learning in the school context during COVID-19. *Education Sciences*, 11(4), 163-170. <https://doi.org/10.3390/educsci11040163>.
- Ochilov, F. I. (2020). Methods of teaching natural sciences to primary school pupils on the basis of a competent. *PalArch's Journal of Archaeology of Egypt/Egyptology*, 17(6), 14520-14539. Retrieved from <https://archives.palarch.nl/index.php/jae/article/view/4533>.
- Pennington, R. C., Stenhoff, D. M., & Tapp, M. C. (2020). Distance education support for students with autism spectrum disorder and complex needs during COVID-19 and school closures. *Rural Special Education Quarterly*, 39(4), 211-219. <https://doi.org/10.1177/8756870520959658>.
- Saidova, M. J. (2022). The use of various forms in teaching future primary school teachers through distance learning. *Eurasian Journal of Humanities and Social Sciences*, 5, 103-107. Retrieved from <https://geniusjournals.org/index.php/ejhss/article/view/642>.
- Sayfiddinovich, K. R. (2021). Didactic bases of ethnopedagogical training of the future teacher in the educational field of university. *Central Asian Journal of Theoretical & Applied Sciences*, 2(11), 226-228.
- Spiteri, M. (2020). Literature review on the factors affecting primary teachers' use of digital technology. *Tech Know Learn*, 25, 115-128. <https://doi.org/10.1007/s10758-018-9376-x>
- Trust, T., & Whalen, J. (2020). Should teachers be trained in emergency remote teaching? Lessons learned from the COVID-19 pandemic. *Journal of Technology and Teacher Education*, 28(2), 189-199.
- Uaidullakyzy, E. (2021). Formation of information and professional competence of primary school teachers with online education. *World Journal on Educational Technology: Current Issues*, 13(4), 838-850. <https://doi.org/10.18844/wjet.v13i4.6269>
- Wangid, M. N., Mustadi, A., & Mokshien, S. E. (2020). The exploration of teachers' efficacy in teaching: Comparative study in Indonesia and Malaysia. *Cakrawala Pendidikan: Jurnal Ilmiah Pendidikan*, 39(2), 257-268, <https://doi.org/https://doi.org/10.21831/cp.v39i2.30012>
- Widodo, A., Rochintaniawati, D., & Riandi, R. (2017). Primary school teachers' understanding of essential science concepts. *Cakrawala Pendidikan: Jurnal Ilmiah Pendidikan*, 36(3), 522-528, <https://doi.org/https://doi.org/10.21831/cp.v36i3.11921>
- Yaroshenko, O. G., Samborska, O. D., & Kiv, A. E. (2019). An integrated approach to digital training of prospective primary school teachers. *Workshop on Cloud Technologies in Education*, 2643, 94-105. <https://doi.org/10.55056/cte.314>