

SHALABAYEVA LAURA¹, UMIRBEKOVA AKERKE^{2*},
BUTABAEVA LAURA³, SOVETKANOVA DAMIRA²

¹International University of Tourism and Hospitality (Turkistan, Kazakhstan)

²Abai Kazakh National Pedagogical University (Almaty, Kazakhstan)

³National Scientific and Practical Center for the Development of Special and Inclusive Education (Almaty, Kazakhstan)

*Address of correspondence: Akerke Umirbekova, Postdoctoral Researcher, Abai Kazakh National Pedagogical University, Muratbayev Str., 14, Almaty, 050014, Republic of Kazakhstan, <https://orcid.org/0000-0001-7964-7322>, E-mail address: umirbekova.akerke@list.ru/ Tel.: +77054870515

Preparing Teachers to Work in an Inclusive Environment within the Framework of the Concept of “Laboratory of the Future in the Classroom”

Abstract

Introduction. The article addresses the issue of preparing future teachers for work in an inclusive educational environment based on the concept of the “Future Classroom Lab.” The purpose of the study is to demonstrate the potential of training future teachers for an inclusive environment through the implementation of the Future Classroom Lab concept: methodology and Methods. During the research, a pedagogical experiment was conducted involving students majoring in education. As part of the experiment, a survey was administered to assess the participants’ knowledge, understanding of inclusive education, and potential challenges in implementing inclusive practices in their future professional activities. Before the survey, students were provided with information on the principles of inclusive education and the essence of the Future Classroom Lab concept. **Results.** The results revealed that future teachers possess a general understanding of inclusive education. The vast majority recognize the importance of inclusive education principles and acknowledge that mastering them has a significant impact on their future professional practice. The Future Classroom Lab concept proved to be highly effective in fostering a high-quality, inclusive educational environment, as well as in developing key competencies such as critical thinking, empathy, tolerance, and quantitative competence among future teachers. The findings of the survey confirm that the Future Classroom Lab concept plays an important role in creating a quality, inclusive educational environment and has a direct influence on the formation of essential professional competencies in future teachers. **Scientific novelty.** The scientific novelty of the study lies in demonstrating that training future teachers within the framework of the Future Classroom Lab concept contributes to the creation of an accessible and high-quality educational environment and enhances the implementation of inclusive education principles. **Practical significance.** The practical significance of the study is that its results can be applied to improve the methodological preparation of future teachers in the process of professional training.

Keywords: inclusive education, classroom lab, educational ecosystem, future teachers, professional competence, inclusive environment.

Introduction. The creation of an educational environment that will enable each specialist to enhance their professional qualifications and develop the necessary abilities is currently the primary necessity of the global educational space. Inclusive education in our country is gradually developing, its foundation is the introduction of the concept of “inclusive education” into the Law “On Education of the Republic of Kazakhstan” (2011), the approval

of comprehensive measures in the direction of inclusive education (Tashina & Semeno 2014), as well as the adoption of conceptual approaches to the development of inclusive education, the adoption of a law on inclusive education (Myronova et al., 2021), the beginning of the transition from the medical model to the socio-pedagogical model, and the implementation of continuous support for inclusive and special education (Rodríguez Herrero et al., 2023).

These significant changes, in turn, will lead to an intensive transition of the model of the specialist training system from the medical model to the social model. In this regard, we see a clear need for highly qualified specialists who can work in an inclusive environment and have mastered the necessary skills in each area of specialist training. Educational organizations must prioritize inclusive policy, culture, and practice. Additionally, the need for new methodological approaches in the training of future teachers makes our research work more significant. In addition to professional skills and practical skills that future teachers must develop in the process of professional education, it is important to have digital literacy, innovative thinking, and creative decision-making skills necessary for working in an inclusive educational environment. In order to adhere to all the principles of inclusive education, future teachers need special methodological skills. This increases the importance of mastering universal skills that take into account the needs of individuals with different educational backgrounds.

A wide range of professional disciplines is offered to help future teachers develop their theoretical knowledge and practical abilities. The content of these disciplines is designed to encompass preparation from a psychological, theoretical, social, and practical standpoint. Psychological preparation is aimed at ensuring the future teacher's continuous motivation to work in an inclusive environment, joint activities with children with special educational needs and their parents. Theoretical preparation provides the future teacher with knowledge of the characteristics of learners, which requires taking into account the educational needs, and social and practical preparation provides psychological, pedagogical, and methodological knowledge, skills necessary to ensure the necessary interactions for future professional activities (Gavrilova, 2022).

The authors stress the significance of training future teachers to acquire knowledge, master skills, possess the necessary principles, and be oriented to taking into account the needs of learners with special educational needs. If we

examine the issue of preparing future teachers for an inclusive educational environment at the international level, future teachers play a great role in creating a favorable and accessible environment for learners (Rodríguez Herrero et al., 2023). In addition, the importance of considering the individual characteristics of learners, preventing possible obstacles in the process of providing support, and considering the possibilities of assessing possible negative impacts, based on which it is necessary to take a comprehensive approach to each educational process (Myronova et al., 2021). The importance of implementing and adapting curricula, developing them, and individualizing them, taking into account the characteristics of each learner, in order to create a quality educational environment in accordance with the future profession, is clearly seen from the following study (Hellmich et al., 2019).

In addition, the importance of studying the fundamental principles in creating an inclusive educational environment has been demonstrated (Polo Sánchez & Aparicio Puerta, 2023). In creating a favorable environment for learners, it is important to closely monitor the classroom situation, that is, to build positive relationships between learners, to build mutual trust and support, and to form a relationship of respect (Stăiculescu et al., 2022). Future teachers should master the methods and mechanisms for preventing obstacles that arise in the future professional environment, since emotional, social, and physical barriers may arise among students, which reduces the ability to create an inclusive education ecosystem on a normal basis (Wenham et al., 2020). In addition, there are cases where the principles of inclusiveness are not fully adhered to in the training of specialists in higher education institutions, and some programs do not include the skills necessary for future professional practice (Costa et al., 2020). In addition to theoretical knowledge, the process of training future teachers should focus on developing practical, i.e., effective use of flexible skills, and the ability to freely use the capabilities of various innovative technologies (Ioerger et al., 2019). In his research, he showed that future teachers should be focused on

mastering the skills necessary for their future profession and developing patience (Borosh et al., 2023).

“Future classroom lab”, that is, future classrooms, provide a clear picture of the form that offers a style of reorganizing a traditionally built classroom. On its basis, there is a high opportunity to adapt learning spaces to teaching styles. The main concept of this approach is based on the work of a living laboratory, that is, a form of effective introduction of ICT technologies into an educational institution. The main principles and policies of this approach are combined with inclusive education. The educational environment created based on the “Future classroom lab” concept will arm the educational path with innovative methods and increase the capabilities of new technologies in transforming the learning and teaching processes. “Future classroom lab” consists of six main learning spaces. Each of its spaces opens up one aspect of learning, and also influences the reconsideration of other aspects of learning in a new direction. Among them, physical space, resources, rapid change of teacher and student roles, and the ability to adhere to different learning styles. “Future classroom lab” consists of six main directions: Investigate, Create, Present, Interact, Exchange, and Develop. These six aspects and directions of the future classroom concept serve as a single mechanism. The concept, as a universal approach, effectively serves in every field of specialist training, including future teachers. That is, by introducing the “Future classroom lab” concept into the professional process of training future teachers, that is, by creating an educational environment based on the concept, future specialists will have the opportunity to increase their level of readiness for the future inclusive educational environment. As we have noted, the principles of the “Future classroom lab” approach are most suitable for ensuring the needs of an inclusive educational environment and are most effective in creating a high-quality ecosystem of inclusive education (Göçen et al., 2020).

The purpose of the study: to demonstrate the possibilities of training future teachers in

an inclusive environment through the concept of “Future Classroom Lab”, based on which the following main tasks are implemented: to substantiate the relevance and importance of the concept of “Future Classroom Lab”; to analyze the experience of training future teachers; to identify the possibilities of training future teachers in an inclusive environment through the concept of “Future Classroom Lab”; to demonstrate the features of an inclusive environment.

Materials and Methods. During the research, the concept of “Future Classroom Lab” was considered, and six of its aspects were analyzed separately. A comparative analysis of the training features of future teachers was conducted, and the qualifications necessary for working in an inclusive education environment were analyzed. An analysis of domestic and foreign experiences and official documents on inclusive education was conducted, and priority areas were based on current practice. The best practices of the “Future Classroom Lab” concept in training future teachers were analyzed, and advanced opportunities were shown. A survey was conducted among future teachers. During the survey, the attitudes of students towards inclusive education were determined. The “Opportunities for Training Future Teachers in an Inclusive Environment” survey consists of the following content: in the first section, general information on the student (age, gender); in the second section, the concept of inclusive education (how they understand inclusive education, their understanding of inclusive education practice); The third section was to determine the views of students (the importance of inclusive education as a profession, the level of preparation for an inclusive environment, the inclusive educational environment, what difficulties may arise in working in an inclusive environment); the fourth section was to teach within the framework of the “Future Classroom Lab” concept (whether the “Future Classroom Lab” concept is familiar, and to assess the usefulness of approaches within the “Future Classroom Lab” concept for adapting to an inclusive educational environment); the fifth section was to ask students two open-ended

questions (what suggestions do you have for improving inclusive education practices in your field, and what is important for future teachers to form inclusive competencies). In addition, a survey method was used among the surveyed students, during which external monitoring of the professional skills of students and their level of adaptation to an inclusive environment was carried out in the educational process. The study was attended by 3rd-year students of the future specialty of primary education (25 students) and 3rd-year students of the specialty of pedagogy and psychology (30 students). The survey was conducted online using Google Forms. We also believe that the majority of 3rd-year students prefer to combine education and professional experience. A comparative analysis of the survey results, as well as taking into account the diversity of the content and meaning of the questions asked in the survey, was used to extract percentage and quantitative

data for closed questions, compare frequencies and percentages, calculate the average value, show the average trend of responses, and use the χ^2 criterion. For open questions, qualitative analysis and diagrams were used. Also, all results were formalized and presented in diagrams and tables.

Results. The main focus of the conducted study was to examine the level of effective collaboration and partnership among future teachers (in physical education and sports, primary education and special pedagogy) their level of inclusive education, readiness for an inclusive educational environment, knowledge of the “Future Classroom Lab” concept and the ability to apply it in their own practice, as well as the potential to effectively implement inclusive education principles in their future professional activities.

General information about the researchers can be found in the following table 1-4.

Table 1

General information about the respondents

Age		Number	%
Category	19-20 y	38	69,1
	21-22 y	17	30,9
Gender		Number	%
Category	Female	49	89,1
	Male	6	10,9

The majority of respondents participating in the study were women (89.1%), which shows that the majority of young people who choose

teaching specialties at a pedagogical university are women.

Table 2

General knowledge and attitudes of respondents about inclusive education

How do you understand inclusive education?		Number	%
	An education system for all, regardless of their specificities	42	76,4
Answer	Education of children with special educational needs in mainstream schools	11	20
	I am having trouble answering	2	3,6
Do you have experience interacting with an inclusive educational environment?		Number	%
Answer	Yes	21	38,2
	No	34	61,8

On this basis, 76.4% of students say that they have an understanding of inclusive education, what inclusive education is in general, and that it provides equal access to all. However, less than half of the students (38.2%) indicated that they have experience of interacting with an inclusive

educational environment, which may be due to the duality of practical work at the university, and we can also see that students have a general understanding of inclusive education, but still lack practical skills.

Table 3

Respondents' attitude to inclusive education

How important is it for teachers to be prepared for an inclusive environment?		Number	%
Answer	Very important	44	80
	It may be important	8	14,5
	I am having trouble answering.	3	5,5
How would you rate your readiness for an inclusive educational environment?		Number	%
Answer	High	21	38,2
	Middle	34	61,8
	Low	34	61,8
What challenges might you face in an inclusive education environment?		Number	%
Answer	Insufficient methodological preparation	27	49,1
	Lack of experience	16	29,1
	Psychological barriers	12	21,8

Just 16.4% of respondents rate their preparedness for an inclusive educational environment as high, even though the vast majority of respondents (94.5%) emphasize

the significance of professional preparation for future teachers. Students identify the primary challenges as having limited practical experience and a lack of methodological expertise.

Table 4

Respondents' level of familiarity with the concept of «Future Classroom Lab».

Are you familiar with the concept of «Future Classroom Lab»?		Number	%
Answer	Yes	15	27,3
	I have heard of it, but I am not familiar with it.	25	45,5
	No	15	27,3
Do you believe that the Future Classroom Lab concept is a necessary and useful tool for adapting to an inclusive educational environment?		Number	%
Answer	Yes	43	78,2
	Half	10	18,2
	No	2	3,6

As we can see from the table, the vast majority of students are not familiar with the concept of “Future Classroom Lab”, while the number of those who say they are familiar with it (only

27.3%), the vast majority of students (78.2%) indicated its usefulness and indicated that it can be very important in creating a flexible, adaptable, and inclusive educational environment.

As for the following open-ended questions among respondents:

Question 1. What recommendations would you make to improve inclusive education in your field?

Key recommendations: familiarization with the practice of inclusive education in general education schools, strengthening practical experience in the future professional environment (46%); development of adapted educational materials (27%); increasing the level of teachers’

knowledge of inclusive methods (18%); creation of inclusive education laboratories in higher education institutions (9%).

Question 2. What, in your opinion, is most important for the formation of inclusive competence of a future teacher?

Key recommendations: empathy and tolerance (39%); correctional - knowledge of pedagogical practices (33%); development of collective interaction skills (16%); psychological preparation (12%).

Figure 1
Open-ended questions results- question 1

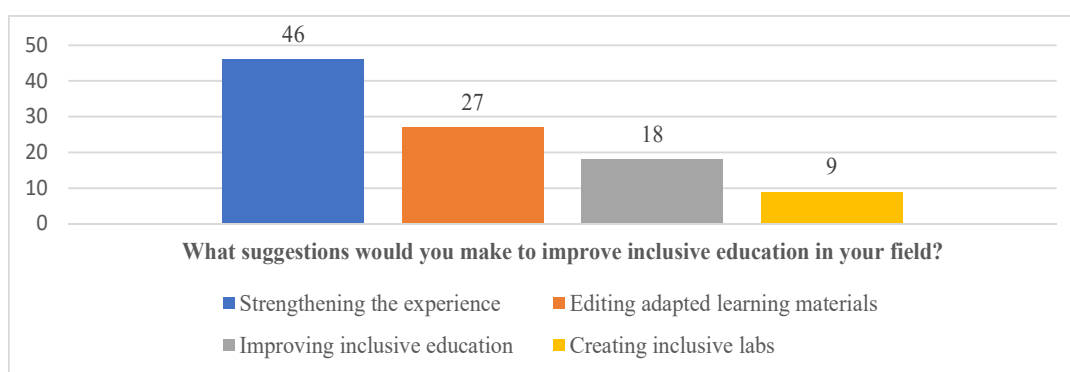
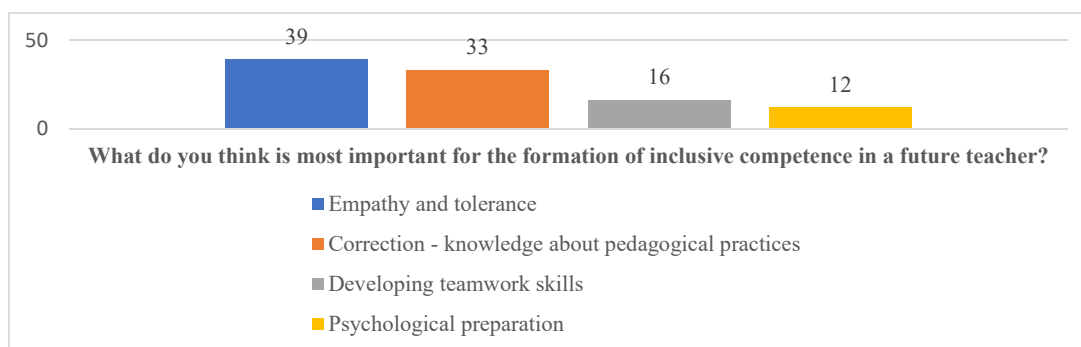


Figure 2
Open-ended questions results-question 2



Analyzing the questions, we were able to prove the following results of the survey: students who combined the educational process and pedagogical practice showed a high level of professionalism, activity, communication, and adaptability. The average level of professional training of these students was 18%, which was higher than that of students without experience (χ^2 -criterion by $p < 0.05$).

The following results were obtained from the study: Students have a general understanding of

inclusive education, however, there is a lack of practical knowledge and methodological skills. The overwhelming majority of participants note the high importance of inclusive training, although the level of individual training of the participants still shows an average level. The concept of “Future Classroom Lab” is perceived by students as a necessary, innovative approach to inclusive education. According to students, the content and skills that require the development of inclusive competence of future

teachers are: empathy, practical orientation, and correct adaptation of innovative tools to the educational environment.

Discussion. Adaptation to the conditions of inclusive education is of particular importance in the process of training future teachers. Although in the current education system, including in the process of training future teachers, the educational process is mainly aimed at working with healthy students, in recent years, there has been an increase in the number of children with special educational needs in general education institutions. In accordance with the inclusion process, the participation of students with special educational needs in the educational process introduces significant changes in the basic principles and structure of the educational environment. This, in turn, increases the need for professionally prepared and adapted specialists who can work effectively in an inclusive environment. Future educators' development of inclusive competency depends heavily on the usage of specialized technologies. In this sense, it is critical to develop approaches that support the development of a top-notch learning environment and consider the needs of students with special educational needs; special didactic methods and approaches that adapt the teaching and upbringing process; interactive learning technologies based on team interaction, empathy, and tolerance are used. The content of training future teachers should include the theoretical and practical foundations of organizing inclusive education, and the professional competence of students is formed through the use of flexible pedagogical approaches that take into account the needs of different students and allow them to fully reveal their potential.

Researchers clearly emphasize the importance of inclusive competence, including the acquisition of the necessary knowledge, skills, and abilities for an inclusive educational environment. Among them, first of all, the future teacher should know the psychological and pedagogical characteristics of a child with special educational needs; secondly, the future teacher should master and develop special methods and approaches that will ensure

equal opportunities in teaching, learning and mastering universal learning activities; thirdly, the readiness to quickly adapt to changes that arise during joint interaction with students with special needs and act in accordance with the situation; fourthly, the ability to master innovative methods, influence the formation of an inclusive culture, work together with other specialists, and build resilience in students (Tashina & Semeno, 2014). In the process of forming future teachers in the process of professional training, the inclusion of inclusive practice as an activity from an early age is a key training component. It allows not only to understand the basic principles of an inclusive educational environment and form a positive attitude towards it, but also to effectively apply the theoretical knowledge gained in practice. Students with special educational needs come into direct contact during the practice, understand the specifics of children, master the mechanisms of adapting educational knowledge, are ready to use adaptive pedagogical technologies, develop their own empathy, and have the opportunity for qualitative reflection on a professional basis. According to scientists, this foundational experience increases the confidence of future teachers in their own strength and knowledge, their readiness to organize the educational process in different situations, and their ability to create a quality educational environment and a positive atmosphere. Early experience of inclusiveness during the educational process directly affects the formation of inclusive competence and professional responsibility (Lucena-Rodríguez et al. 2025).

Teachers in today's inclusive practice frequently favor using an instructional model that has been modified especially for students with special education needs. If this methodology were based on each student's unique learning trajectory, it would be much more effective. To put it another way, improving the efficacy of inclusive practice necessitates developing universal competences in aspiring teachers, which will allow them to deliver teaching that is in line with the requirements of all students, rather than focusing just on the child with special educational needs. The

development of the required competencies in practice is directly impacted by the programs put into place within the suggested experimental framework, as well as by future teachers' direct interaction with students who have special educational needs - that is, their immersion in the educational environment. Since this directly affects their capacity to make wise pedagogical judgments and fosters the growth of emotional intelligence, it is critical to mold future educators' general attitudes toward the inclusive educational environment while they are still in the professional preparation stage.

Also, according to the results of the study, future teachers, including female teachers, have a positive attitude toward inclusive education, while male students advocate strict adherence to the principles of inclusive education. The formation of a positive attitude to inclusive education in future teachers is an important part of the training process of future teachers, which directly affects the correct perception of experience and pedagogical values.

Conclusion. We can make the following deductions after analyzing the study's findings: These days, inclusive education is one of the top priorities for social development and holds a substantial position in the educational system. To put it another way, inclusive education is a crucial tool for creating a society that is inclusive. Such a society is significantly shaped by the excellent training of aspiring educators. Our research showed that future experts in elementary education, special pedagogy, and physical education and sports must have a common set of universal competences. These include the ability to develop an inclusive culture, comprehend changes pertaining to the inclusive educational environment, and successfully use their knowledge in inclusive practice. There are cases when the perception of students with special educational needs, understanding, organization of the learning

environment, and the formation of a quality and accessible educational environment, taking into account their individual characteristics, are perceived by the deficit education model, which directly affects the professional orientation of future teachers. In order to eliminate these obstacles, it is necessary to supplement the content of higher education programs with inclusive content, introduce practice-oriented teaching forms that ensure inclusive practice, and establish direct contact of future teachers with students with special educational needs based on professional experience.

As the study shows, the attitude of future teachers to inclusive education varies depending on the students' gender, age, academic specialty, and professional experience. On its basis, the development of social and emotional competencies is of great importance, including the ability to self-reflect, professional empathy, and the effective introduction of inclusion principles into pedagogical practice. The results of the study showed that the introduction of practice-based and innovative approaches to the training process of future teachers based on the concept of "Future Classroom Lab" has a significant impact on the development of an inclusive culture, increasing student motivation and improving the quality of creating an inclusive educational environment. This framework, in turn, serves as a key mechanism for implementing innovative transformations within the pedagogical education system, exerting a significant influence on the development of an inclusive society and the provision of accessible education for all learners.

Funding. This research has been funded by the Science Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan under the project AP27510667 Development of an Inclusive Education Ecosystem Based on the Future Classroom Lab Model.

References

Borosh, A. M., Newson, A., Mason, R. A., Richards, C. D., & Collins Crosley, H. (2023). Special education teacher-delivered training for paraeducators: A systematic and quality review. *Teacher Education and Special Education, 46*(3), 223-242. <https://journals.sagepub.com/doi/abs/10.1177/08884064231160575>

Costa, P. L. S., Modica, N. D. S., & Santos, C. L. N. D. (2020). Teacher training and pedagogical practice in the inclusion process of young students with disabilities in higher education institutions. *Praxis Educacional Journal*, 16(42), 115-134. http://educa.fcc.org.br/scielo.php?pid=S2178-26792020000300105&script=sci_arttext

Gavrilova, E.A. (2022). Training of Future Teachers for Work in an Inclusive Educational Environment. *Society: Sociology, Psychology, Pedagogy*, 8(100), 235-239. <https://cyberleninka.ru/article/n/podgotovka-buduschih-pedagogov-k-rabote-v-inklyuzivnoy-obrazovatelnoy-srede>

Göçen, A., Eral, S. H., & Bücü, M. H. (2020). Teacher perceptions of a 21st century classroom. *International Journal of Contemporary Educational Research*, 7(1), 85-98. <https://dergipark.org.tr/en/pub/ijcer/issue/54696/638110>

Hellmich, F., Löper, M. F., & Görel, G. (2019). The role of primary school teachers' attitudes and self-efficacy beliefs for everyday practices in inclusive classrooms—a study on the verification of the 'Theory of Planned Behaviour'. *Journal of Research in Special Educational Needs*, 19, 36-48. <https://nasenjournals.onlinelibrary.wiley.com/doi/abs/10.1111/1471-3802.12476>

Ioerger, M., Machia, L. V., & Turk, M. A. (2019). Self-other overlap: A unique predictor of willingness to work with people with disability as part of one's career. *Plos One*, 14(8), e0220722. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0220722>

Lucena-Rodríguez, C., Invernón-Gómez, A. I., Ortiz-Marcos, J. M., & Sánchez-Mendías, J. (2025). Preparing future teachers for inclusive practices and disability: A systematic literature review. *International Journal of Instruction*, 18(3), 59-78. <https://e-iji.net/ats/index.php/pub/article/view/765>

Myronova, S., Dokuchyna, T., Rudzevych, I., Smotrova, O., & Platash, L. (2021). Current problems of teachers' readiness of higher educational institutions for implementing inclusive education. *Revista Romaneasca Pentru Educatie Multidimensionala*, 13(3), 151-165. <https://lumenpublishing.com/journals/index.php/rrem/article/view/3473>

Polo Sánchez, M. T., & Aparicio Puerta, M. (2023). Perceptions of university students with disabilities in Spain: ideas and beliefs about attitudes towards their inclusion. *Disability & Society*, 38(8), 1435-1450. <https://www.tandfonline.com/doi/abs/10.1080/09687599.2021.1997716>

Rodríguez Herrero, P., García Sempere, P. J., & García, A. C. (2023). Inclusive co-teaching with teachers with intellectual disabilities in teacher education. *European Journal of Teacher Education*, 1-17. <https://www.tandfonline.com/doi/abs/10.1080/02619768.2023.2288550>

Stăiculescu, C., Dincă, V. M., & Gheba, A. (2022). Analysis of the factors influencing the favorable participation of students with special needs in public tertiary education in Romania. *Sustainability*, 14(17), 10803. <https://www.mdpi.com/2071-1050/14/17/10803>

Tashina, T.M., & Semeno, A.A. (2014). Training specialists to work in inclusive education. *Modern Research of Social Problems*, 2(34). <https://cyberleninka.ru/article/n/podgotovka-spetsialistov-k-rabote-v-inklyuzivnom-obrazovanii>

Wenham, K. E., Valencia-Forrester, F., & Backhaus, B. (2020). Make or break: The role and support needs of academic advisors in work-integrated learning courses. *Higher Education Research & Development*, 39(5), 1026-1039. <https://www.tandfonline.com/doi/abs/10.1080/07294360.2019.1705254>

Information about authors:

Shalabayeva Laura, PhD, Associate Professor, International University of Tourism and Hospitality, ORCID ID: 0000-0003-2231-7888, email: lolabany84@mail.ru

Umirbekova Akerke, PhD, associate professor, Postdoctoral researcher, Abai Kazakh National Pedagogical University, ORCID ID: 0000-0001-7964-7322, email: umirbekova.akerke@list.ru

Butabayeva Laura, PhD, Associate Professor, National Scientific and Practical Center for the Development of Special and Inclusive Education, ORCID ID: 0000-0002-3758-8624, email: lbutabayeva@gmail.com

Sovetkanova Damira, PhD, Postdoctoral researcher, Abai Kazakh National Pedagogical University, ORCID ID: 0000-0003-2737-4021, email: Dami_88@list.ru