

Өтегенова Әлия Амантайқызы – филология ғылымдарының кандидаты, Әлеуметтік-гуманитарлық пәндер кафедрасының аға оқытушысы, "Esil University" мекемесі, Қазақстан Республикасы, 010000 Астана қ., С. Сейфуллин көш 14/4, 10 пәтер, тел.: 87471562678, e-mail: utegenova2026@inbox.eu.

Құдайбергенова Бибігүл Исағалиқызы – Әлеуметтік-гуманитарлық пәндер кафедрасының аға оқытушысы, "Esil University" мекемесі, Қазақстан Республикасы, 010000 Астана қ., Мәңгілік ел көш 72, 62 пәтер, тел.: 87029932591, e-mail: bibigul.kudai@gmail.com.

Urunbassarova Eleonora Adalovna – Doctor of Pedagogical Sciences, Professor, Department of social and humanitarian disciplines, "Esil University" Institution, Republic of Kazakhstan, 010000, Astana, 16/1 Respublika Str., apt. 28, tel.: 87760043383; e-mail: ela.urunbasarova@mail.ru.

Nurakhanova Elmira Muratovna* – Master of Pedagogical Sciences, Senior Lecturer, Department of social and humanitarian disciplines, "Esil University" Institution, Republic of Kazakhstan, 010000, Astana, 9 Zh. Tarkhan Str., apt. 172., tel.: 8070226779; e-mail: aiman07.1976@mail.ru.

Utegenova Aliya Amantayevna – Candidate of Philological Sciences, Senior Lecturer, Department of social and humanitarian disciplines, "Esil University" Institution, Republic of Kazakhstan, 010000, Astana, 14/4 S. Seifullin Str., apt. 10, tel.: +7471562678, e-mail: utegenova2026@inbox.eu.

Kudaibergenova Bibigul Isagaliyevna – Senior Lecturer, Department of social and humanitarian disciplines, "Esil University" Institution, Republic of Kazakhstan, 010000, Astana, 72 Mangilik El Str., apt. 62, tel.: +77029932591, e-mail: bibigul.kudai@gmail.com.

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COGNITIVE DEVELOPMENT OF FUTURE EDUCATORS IN AN INTERNATIONAL EDUCATIONAL ENVIRONMENT: A COMPARATIVE ANALYSIS OF KAZAKHSTAN AND CHINA

Fang Y. – PhD student, Abai Kazakh National Pedagogical University, Almaty, Republic of Kazakhstan.

Kalimoldayeva A.K.* – Doctor of Pedagogical Sciences, Abai Kazakh National Pedagogical University, Almaty, Republic of Kazakhstan.

Abilmazhinova O.S. – PhD, Abai Kazakh National Pedagogical University, Almaty, Republic of Kazakhstan.

Li Ye.D. – Candidate of Pedagogical Sciences, Head of the Department of preschool and primary education, Akhmet Baitursynuly Kostanay Regional University, Kostanay, Republic of Kazakhstan.

The article presents a comparative analysis of the self-assessment of cognitive competencies among future teachers in Kazakhstan and China. The study covers four interrelated areas: cognitive adaptability, confidence in critical thinking and problem-solving, intercultural competence, and digital learning experience. A mixed comparative research design was employed, involving 240 prospective teachers, including 120 students from Kazakhstan and 120 students from China. Validated self-report instruments were used to assess cognitive flexibility, critical thinking, problem-solving orientation, intercultural sensitivity, and perceptions of digital learning. Quantitative data were analyzed using descriptive statistics, an independent-samples t-test, and the χ^2 test, while qualitative data were analyzed using thematic analysis.

The results revealed statistically significant differences between the two groups across the indicators examined. Chinese participants demonstrated higher self-reported levels of cognitive adaptability, confidence in critical thinking and problem-solving, intercultural competence, and perceived effectiveness of digital educational technologies. At the same time, the findings reflect differences in the participants' perceived competencies and educational experiences and should not be interpreted as evidence of objectively higher cognitive abilities or the overall superiority of one national teacher education system over the other. The findings highlight the importance of further developing reflective, problem-based, intercultural, and digital learning in contemporary teacher education.

Key words: cognitive adaptability, critical thinking, cross-cultural competence, digital learning, teacher education.

ҚАЗАҚСТАН МЕН ҚЫТАЙ ХАЛЫҚАРАЛЫҚ БІЛІМ БЕРУ ОРТАСЫНДАҒЫ БОЛАШАҚ ПЕДАГОГТЕРДІҢ ТАНЫМДЫҚ ДАМУЫН САЛЫСТЫРМАЛЫ ТАЛДАУ

Фан Ю. – PhD докторант, Абай атындағы Қазақ ұлттық педагогикалық университеті, Алматы қ., Қазақстан Республикасы.

Калимолдаева А.К.* – педагогика ғылымдарының докторы, Абай атындағы Қазақ ұлттық педагогикалық университеті, Алматы қ., Қазақстан Республикасы.

Абильмәжинова О.С. – PhD, Абай атындағы Қазақ ұлттық педагогикалық университеті, Алматы қ., Қазақстан Республикасы.

Ли Е.Д. – педагогика ғылымдарының кандидаты, мектепке дейінгі және бастауыш білім беру кафедрасының меңгерушісі, Ахмет Байтұрсынұлы атындағы Қостанай өңірлік университеті, Қостанай қ., Қазақстан Республикасы.

Мақалада Қазақстан мен Қытайдағы болашақ педагогтардың когнитивтік құзыреттерін өзіндік бағалауының салыстырмалы ерекшеліктері қарастырылады. Зерттеуде когнитивтік бейімделгіштік, сыни ойлау және проблемаларды шешуге деген сенімділік, мәдениетаралық құзыреттілік және цифрлық оқыту тәжірибесі сияқты төрт өзара байланысты бағыт қамтылды. Зерттеуде аралас әдісті салыстырмалы дизайн қолданылып, оған Қазақстаннан 120 және Қытайдан 120, барлығы 240 болашақ педагог қатысты. Когнитивтік икемділікті, сыни ойлау бейімділігін, проблемаларды шешу бағдарын, мәдениетаралық сезімталдықты және цифрлық оқытуды қабылдауды бағалау үшін валидтелген өзіндік есеп беру құралдары пайдаланылды. Сандық деректер сипаттамалық статистика, тәуелсіз таңдауларға арналған t-критерийі және χ^2 критерийі арқылы, ал сапалық деректер тақырыптық талдау әдісімен өңделді. Нәтижелер зерттелген көрсеткіштер бойынша екі топ арасында статистикалық маңызды айырмашылықтар бар екенін көрсетті. Қытайлық қатысушылар когнитивтік бейімделгіштік, сыни ойлау және проблемаларды шешуге деген сенімділік, мәдениетаралық құзыреттілік және цифрлық білім беру технологияларының қабылданатын тиімділігі бойынша жоғары өзіндік бағалау көрсеткіштерін көрсетті. Сонымен бірге бұл нәтижелер қатысушылардың қабылдайтын құзыреттері мен білім беру тәжірибелеріндегі айырмашылықтарды көрсетеді және когнитивтік қабілеттердің объективті түрде жоғары екенін немесе ұлттық педагогикалық білім беру жүйелерінің бірінің жалпы артықшылығын дәлелдейтін нәтиже ретінде түсіндірілмеуі тиіс. Зерттеу нәтижелері болашақ педагогтарды даярлауда рефлексивті, проблемалық-бағытталған, мәдениетаралық және цифрлық оқыту тәсілдерін одан әрі дамытудың маңыздылығын көрсетеді.

Түйінді сөздер: когнитивтік бейімделгіштік; сыни ойлау; мәдениетаралық құзыреттілік; цифрлық оқу; педагог даярлау.

СРАВНИТЕЛЬНЫЙ АНАЛИЗ КОГНИТИВНОГО РАЗВИТИЯ БУДУЩИХ ПЕДАГОГОВ В МЕЖДУНАРОДНОЙ ОБРАЗОВАТЕЛЬНОЙ СРЕДЕ КАЗАХСТАНА И КИТАЯ

Фан Ю. – PhD докторант, Казахский национальный педагогический университет имени Абая, г. Алматы, Республика Казахстан.

Калимолдаева А.К.* – доктор педагогических наук, Казахский национальный педагогический университет имени Абая, г. Алматы, Республика Казахстан.

Абильмажинова О.С. – PhD, Казахский национальный педагогический университет имени Абая, г. Алматы, Республика Казахстан.

Ли Е.Д. – кандидат педагогических наук, заведующая кафедрой дошкольного и начального обучения, Костанайский региональный университет имени Ахмет Байтұрсынұлы, г. Костанай, Республика Казахстан.

В статье представлен сравнительный анализ самооценки когнитивных компетенций будущих педагогов Казахстана и Китая. Исследование охватывает четыре взаимосвязанных направления: когнитивную адаптивность, уверенность в критическом мышлении и решении проблем, межкультурную компетентность и опыт цифрового обучения. Использован смешанный сравнительный дизайн исследования, в котором приняли участие 240 будущих педагогов, включая 120 студентов из Казахстана и 120 студентов из Китая. Для оценки когнитивной гибкости, критического мышления, ориентации на решение проблем, межкультурной чувствительности и восприятия цифрового обучения применялись валидированные инструменты самооценки. Количественные данные анализировались с использованием описательной статистики, t-критерия для независимых выборок и критерия χ^2 , а качественные данные – методом тематического анализа. Результаты выявили статистически значимые различия между двумя группами по исследуемым показателям. Китайские участники продемонстрировали более высокие показатели самооценки когнитивной адаптивности, уверенности в критическом мышлении и решении проблем, межкультурной компетентности и воспринимаемой эффективности цифровых образовательных технологий. Вместе с тем полученные результаты отражают различия в воспринимаемых компетенциях и образовательном опыте участников и не должны интерпретироваться как доказательство объективно более высоких когнитивных способностей или общего превосходства одной национальной системы подготовки педагогов. Полученные результаты подчёркивают значимость

дальнейшего развития рефлексивного, проблемно-ориентированного, межкультурного и цифрового обучения в современной системе подготовки будущих педагогов.

Ключевые слова: когнитивная адаптивность, критическое мышление, межкультурная компетентность, цифровое обучение, подготовка педагогов.

Introduction. The internationalization of education has led to profound transformations in cognitive development among future educators. As teaching methodologies evolve to meet the demands of a globally interconnected world, educators are increasingly required to develop advanced cognitive competencies, including critical thinking, problem-solving, adaptability, and cross-cultural communication. The growing emphasis on global education standards, digital learning environments, and interdisciplinary pedagogical approaches has necessitated a re-evaluation of how cognitive development occurs in teacher training programs. In this regard, understanding how different educational systems foster the cognitive growth of future educators is critical for ensuring their readiness to operate in diverse learning contexts.

Kazakhstan and China provide a relevant comparative context for examining cognitive competencies among future educators. Although the two countries have different educational traditions, institutional contexts, and approaches to digital transformation, both have undertaken reforms aimed at improving the quality of teacher education and preparing educators for increasingly internationalized learning environments. Comparing these contexts makes it possible to examine differences in students' perceived cognitive competencies and educational experiences without assuming that one national system is inherently more effective than the other.

Cognitive development in teacher education is closely connected with students' ability to reflect on their learning, regulate cognitive activity, adapt to changing educational demands, and apply knowledge in complex situations. Bonkal, Grebennikova, Belentsov and Malkov emphasize the importance of metacognitive competencies, including the ability to monitor one's own thinking, assess intellectual resources, plan cognitive activity, and select appropriate ways of obtaining and processing new knowledge [1, p. 1170]. These aspects are particularly relevant to contemporary teacher education, where future educators are expected not only to acquire professional knowledge but also to regulate their own learning and respond flexibly to changing educational contexts. Prosekov, Morozova and Grinenko also demonstrate that cognitive style is related to the ways students perceive and process information and is associated with self-regulation and creative abilities [2, p. 474]. Thus, cognitive development can be understood as a multidimensional process involving metacognitive regulation, cognitive flexibility, analytical thinking, and creative activity.

The cognitive development of future educators is also closely related to teacher cognition and professional preparation. Borg conceptualizes teacher cognition through teachers' thinking, knowledge, and beliefs and examines their relationship with teacher education and classroom practice [3, pp. 81-84]. This perspective indicates that the cognitive characteristics of future educators are relevant not only to academic learning but also to their subsequent professional decision-making and pedagogical practice. Kipchakova emphasizes that the professional preparation of future teachers should include the development of competencies, knowledge, skills, and personal qualities necessary for effective professional activity [4, pp. 181-182]. Salmerón Aroca, Moreno Abellán and Martínez de Miguel López further emphasize the importance of continuous professional development and adaptive ways of responding to professional demands in contemporary teaching [5, p. 71]. Taken together, these studies suggest that the preparation of future educators requires attention to cognitive, reflective, adaptive, and professional dimensions.

The study addresses the following research questions: (1) What differences can be identified in the self-reported cognitive competencies of future educators in Kazakhstan and China? (2) How do cognitive adaptability, critical thinking and problem-solving, cross-cultural competence, and technology-related learning experiences vary between the two groups? (3) What educational and contextual factors may be associated with the observed differences in self-reported cognitive competencies? (4) What implications can these findings provide for improving teacher education in an internationalized educational environment?

The significance of the study lies in its comparative examination of several interrelated dimensions of cognitive competence within teacher education. Rather than treating cognitive development as a single measurable characteristic, the study considers cognitive adaptability, critical thinking and problem-solving, cross-cultural competence, and technology-related learning experiences as complementary dimensions. Such an approach makes it possible to identify patterns in the perceived competencies and educational experiences of future educators and to examine how these patterns may differ across national educational contexts. The findings may provide useful insights for teacher education institutions and curriculum developers seeking to strengthen student-centered, reflective, digitally supported, and internationally oriented learning environments.

The aim of this study is to comparatively examine self-reported cognitive competencies among future educators in Kazakhstan and China, focusing on cognitive adaptability, critical thinking and problem-solving, cross-cultural competence, and technology-related learning experiences.

Objectives:

1. To assess the self-reported cognitive adaptability of future educators in Kazakhstan and China.

2. To compare students' self-reported confidence in critical thinking and problem-solving between the two national groups.
3. To examine differences in self-reported cross-cultural competence among future educators in Kazakhstan and China.
4. To identify differences in students' perceived experiences and effectiveness of digital learning technologies.
5. To determine the educational and contextual factors that may be associated with differences in the reported cognitive competencies.
6. To formulate implications for improving teacher education in an internationalized educational environment.

Materials and methods. The quantitative component of the study included 240 pre-service teachers, comprising 120 participants from Kazakhstan and 120 participants from China. The Kazakhstani participants were recruited from Abai Kazakh National Pedagogical University, while the Chinese participants were recruited from Beijing Normal University and East China Normal University. All participating institutions provide teacher education programs at the higher education level. The participants represented different years of study and teaching specializations. A purposive sampling approach was used to include students with diverse educational backgrounds and learning experiences.

For the qualitative component, 20 teacher educators participated in semi-structured interviews, including 10 educators from Kazakhstan and 10 from China. In addition, two focus groups were conducted in each country, with 5-7 pre-service teachers in each group, to obtain contextual information about students' educational experiences and perceptions of cognitive competency development.

To assess the selected dimensions of cognitive competence, validated self-report instruments were used. Cognitive flexibility was assessed using the 20-item Cognitive Flexibility Inventory (CFI) developed by Dennis and Vander Wal (2010), which measures the ability to perceive alternative perspectives and maintain cognitive control. Critical thinking disposition was assessed using the California Critical Thinking Disposition Inventory (CCTDI) developed by Facione and Facione (1992), comprising 75 items across seven dimensions. Problem-solving orientation was measured using the 35-item Problem Solving Inventory (PSI) developed by Heppner and Petersen (1982). Intercultural sensitivity was assessed using the 24-item Intercultural Sensitivity Scale (ISS) developed by Chen and Starosta (2000), covering five dimensions of intercultural interaction. Students' perceptions of the usefulness of digital technologies for learning were assessed using items based on Davis's (1989) Technology Acceptance Model (TAM). All instruments employed Likert-type response scales. The instruments were translated and culturally adapted for the Kazakhstani and Chinese samples using a translation-back-translation procedure. Internal consistency was evaluated using Cronbach's alpha coefficients for each scale and subscale in the present sample.

Results. The quantitative findings were analyzed comparatively to identify differences in self-reported cognitive competencies and technology-related learning experiences among pre-service teachers in Kazakhstan and China. The analysis focused on four dimensions: cognitive adaptability, critical thinking and problem-solving, intercultural competence, and perceived effectiveness of digital learning technologies. Independent-samples t-tests were used to compare continuous scores, while chi-square tests of independence were applied to categorical responses. The results are presented in Tables 1-5 and Figures 1-4.

Cognitive adaptability was examined through students' self-reported ability to adjust to changing teaching methods, digital learning environments, cross-cultural problem-solving situations, and new curriculum structures. An independent-samples t-test was used to compare the two national groups.

Table 1 – Cognitive adaptability scores (Mean $\pm$ SD)

Cognitive Adaptability Indicators	Kazakhstan (n=120)	China (n=120)	t-value	p-value
Flexibility in adapting teaching methods	3.8 $\pm$ 0.6	4.2 $\pm$ 0.5	-2.08	0.041*
Confidence in digital learning environments	4.0 $\pm$ 0.5	4.4 $\pm$ 0.4	-2.26	0.027*
Problem-solving in cross-cultural settings	3.5 $\pm$ 0.7	4.1 $\pm$ 0.5	-2.66	0.012*
Ability to adjust to new curriculum structures	3.7 $\pm$ 0.6	4.3 $\pm$ 0.4	-3.12	0.004**

(*p < 0.05, **p < 0.01, statistically significant)

Table 1 demonstrates that Chinese students scored significantly higher on all adaptability indicators. The largest difference is observed in adjusting to new curriculum structures (p = 0.004), suggesting that Chinese universities provide more dynamic learning environments. Interviews with faculty members support this conclusion, indicating that Chinese teacher training programs emphasize experiential learning and adaptive problem-solving tasks. Figure 1 visualizes the differences in cognitive adaptability scores.

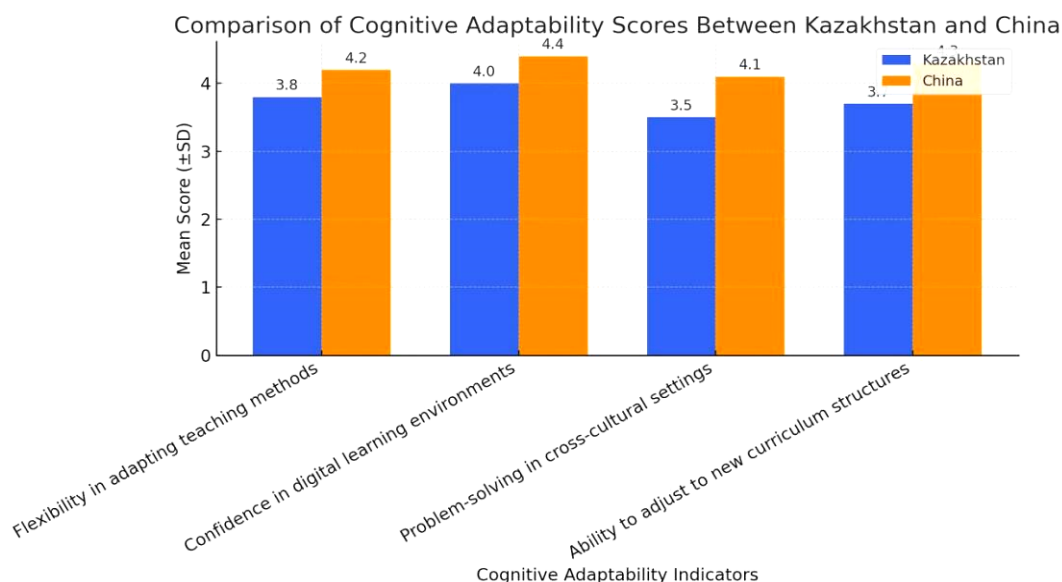


Figure 1 – Cognitive adaptability scores of future educators

2. Critical thinking and problem-solving in pedagogy. Critical thinking is fundamental for future educators, enabling analytical reasoning and evidence-based teaching. Table 2 summarizes self-reported confidence levels in critical thinking skills.

Table 2 – Self-reported confidence in critical thinking (%)

Critical thinking competencies	Kazakhstan (%)	China (%)	χ^2	p-value
Logical reasoning	58	74	3.92	0.048*
Evaluating multiple perspectives	62	80	4.37	0.036*
Problem-solving strategies	55	78	5.41	0.020*
Reflective teaching practices	59	73	3.85	0.049*

($p < 0.05$, statistically significant differences detected using chi-square test.)

The results indicate that Chinese students reported higher confidence levels across all critical thinking indicators. The largest gap appears in problem-solving strategies ($p = 0.020$), which may be attributed to problem-based learning (PBL) approaches in Chinese curricula.

Figure 2 provides a visual representation of these findings.

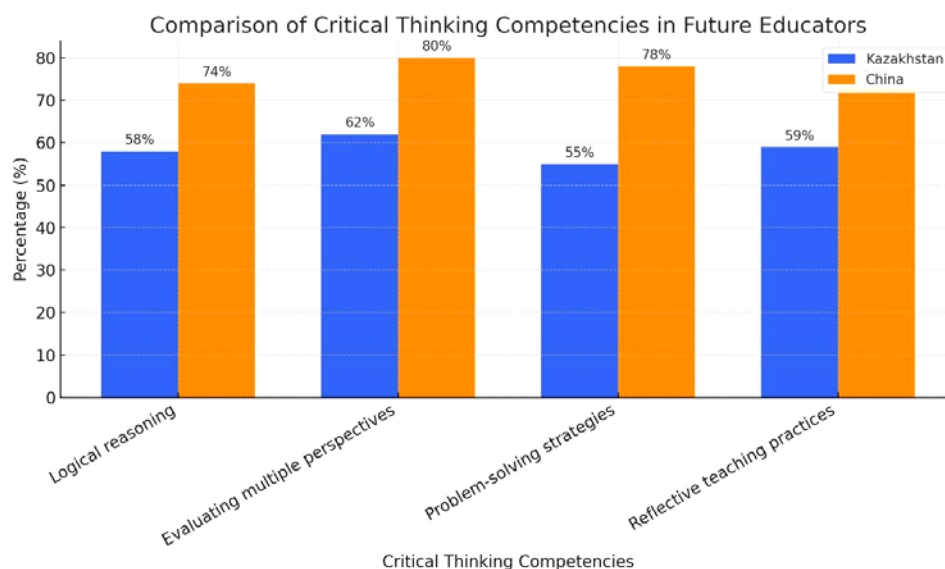


Figure 2 – Confidence in Critical Thinking Among Future Educators

Interviews with students revealed that Kazakhstani education remains lecture-dominated, limiting opportunities for analytical discussions and problem-solving exercises. In contrast, Chinese institutions encourage Socratic questioning, case-based learning, and simulation exercises to enhance critical thinking.

3. Cross-cultural competencies in internationalized education. Table 3 outlines students' self-assessment of their cross-cultural competencies, crucial for effective teaching in international educational settings.

Table 3 – Cross-cultural competency scores (Mean $\pm$ SD)

Cross-cultural competency indicators	Kazakhstan (n=30)	China (n=30)	t-value	p-value
Confidence in teaching international students	3.2 $\pm$ 0.8	4.0 $\pm$ 0.6	-2.82	0.008**
Understanding of global educational trends	3.6 $\pm$ 0.7	4.3 $\pm$ 0.5	-3.12	0.003**
Participation in international collaboration projects	2.9 $\pm$ 0.9	3.8 $\pm$ 0.7	-2.55	0.015*

(*p < 0.05, *p < 0.01, statistically significant)

The results demonstrate that Chinese students exhibit stronger cross-cultural competencies. The most significant difference is in understanding global educational trends (p = 0.003), likely due to greater exposure to international teaching methodologies and exchange programs.

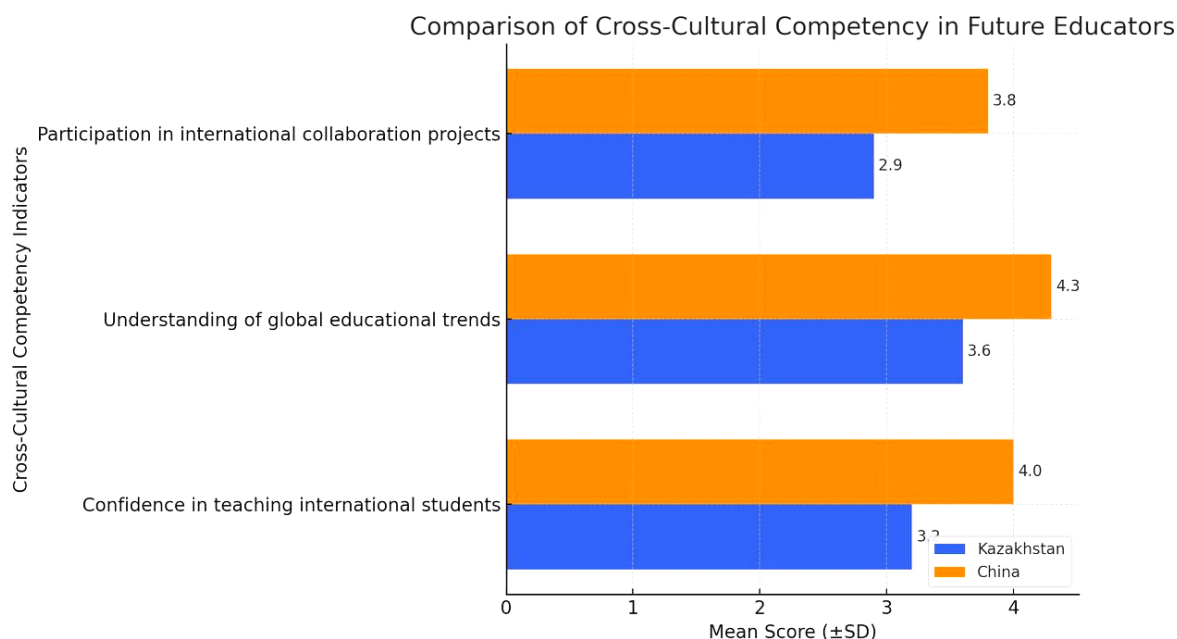


Figure 3 – Self-reported cross-cultural competency scores

4. Role of digital technologies in cognitive development. Digital tools are increasingly integrated into teacher training programs. Table 4 highlights students' perceptions of the impact of digital technologies on cognitive development.

Table 4 – Perceived impact of digital technologies on learning (%)

Digital Learning Aspects	Kazakhstan (%)	China (%)	χ^2	p-value
Interactive e-learning platforms	68	85	4.23	0.041*
AI-based personalized learning	54	82	5.91	0.016*
Virtual reality (VR) teaching simulations	49	77	6.42	0.011*
Adaptive assessment tools	63	79	3.89	0.049*

(p < 0.05, statistically significant)

Chinese students report significantly higher engagement with AI-based learning platforms and VR teaching simulations. Regression analysis suggests a strong correlation between digital tool engagement and perceived cognitive improvement ($R^2=0.67$, $p=0.002$, $R^2=0.67$, $p=0.002$).

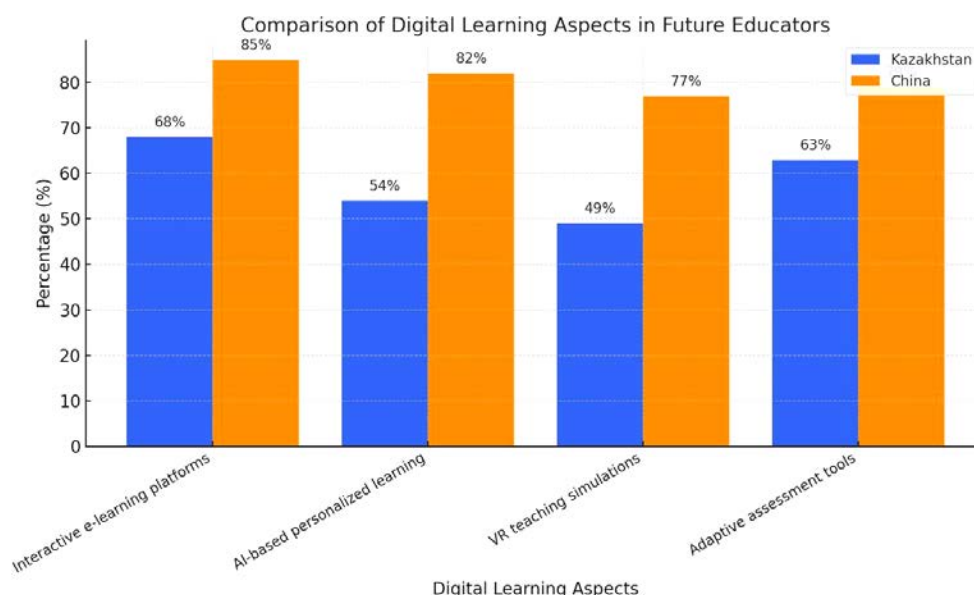


Figure 4 – Perceived effectiveness of digital learning tools

5. Summary of Key Findings

Table 5 – Comparative overview of cognitive development factors

Cognitive Factor	Kazakhstan	China	Significant Difference
Cognitive Adaptability	Moderate	High	Yes ($p < 0.05$)
Critical Thinking	Lower confidence	Higher confidence	Yes ($p < 0.05$)
Cross-Cultural Competencies	Limited exposure	Higher exposure	Yes ($p < 0.01$)
Digital Learning Impact	Moderate (content-focused)	High (interactive, AI-driven)	Yes ($p < 0.01$)

Key Interpretations:

1. Chinese students demonstrate superior cognitive adaptability, particularly in problem-solving and digital learning integration.
2. Critical thinking training in China is more structured, utilizing AI-based simulations and Socratic questioning techniques.
3. Cross-cultural competencies are significantly higher in China due to increased participation in international education programs.
4. Kazakhstani students rely more on traditional methods, whereas Chinese students benefit from AI-enhanced adaptive learning environments.

Discussion. The findings indicate statistically significant differences between the Kazakhstani and Chinese groups across the four assessed dimensions: cognitive adaptability, critical-thinking and problem-solving confidence, intercultural competence, and perceived effectiveness of digital learning technologies. However, these differences should be interpreted as differences in students' self-reported competencies and educational experiences rather than as direct evidence of objectively higher cognitive abilities. This distinction is particularly important because the study employed predominantly self-report measures and a cross-sectional comparative design.

The results for cognitive adaptability show consistently higher self-reported scores among Chinese participants across all four indicators. The strongest difference concerned the ability to adjust to new curriculum structures, followed by problem-solving in cross-cultural settings. These findings are consistent with the broader understanding of cognitive development as involving flexibility, reflection, regulation of learning, and the ability to respond to changing educational demands. Previous research has emphasized the importance of metacognitive regulation and students' ability to monitor and organize their own cognitive activity [1, p. 1170]. From this perspective, the observed differences may reflect differences in students' learning experiences and exposure to changing instructional environments rather than differences in general cognitive ability.

The findings concerning critical thinking and problem-solving similarly demonstrate higher levels of reported confidence among Chinese participants. Significant differences were identified in logical reasoning, evaluation of multiple perspectives, problem-solving strategies, and reflective teaching practices. These results are relevant to research on teacher cognition, which emphasizes the relationship between teachers'

knowledge, beliefs, thinking processes, and professional preparation [3, pp. 81-84]. Nevertheless, because the present study measured students' perceived confidence rather than their performance on standardized critical-thinking tasks, the findings should not be interpreted as demonstrating that Chinese students possess objectively stronger critical-thinking skills. Rather, they indicate that the Chinese participants in this sample reported greater confidence in applying such skills.

The intercultural competence findings reveal a similar pattern. Chinese participants reported higher levels of confidence in teaching international students, understanding global educational trends, and participating in international collaboration projects. This pattern may be associated with differences in students' exposure to international educational activities and intercultural learning opportunities. Research on preservice teachers in Chinese contexts has also shown that teacher cognition is relevant to the development of intercultural competence and that curriculum design can influence how future teachers understand and approach intercultural education [6]. However, the present study does not provide sufficient evidence to determine whether national educational systems themselves caused the observed differences. The findings should therefore be interpreted as differences in reported intercultural experiences and preparedness within the participating groups.

Digital learning experiences represent another area in which statistically significant differences were identified. Chinese participants reported greater perceived effectiveness of interactive e-learning platforms, AI-based personalized learning, virtual-reality simulations, and adaptive assessment tools. The regression result also indicated a positive association between engagement with digital learning tools and perceived cognitive improvement. This association is consistent with the growing role of digitally supported learning environments in teacher education. At the same time, the cross-sectional design does not allow a causal conclusion that digital technologies directly produced cognitive improvement. The result should therefore be understood as an association between students' engagement with digital learning technologies and their perceptions of learning-related cognitive benefits [7].

Taken together, the results suggest that the observed differences are multidimensional. They involve not only cognitive adaptability but also students' confidence in critical thinking, intercultural preparedness, and perceptions of digitally supported learning. This interpretation is consistent with contemporary approaches to teacher preparation, which view professional competence as a combination of knowledge, skills, reflective capacity, adaptability, and personal characteristics. Thus, cognitive development in teacher education should not be reduced to a single numerical indicator or interpreted independently from the educational environment in which future teachers study [8, pp. 71-86].

The qualitative component provides additional contextual information for interpreting the quantitative findings. Participants and teacher educators described differences in instructional practices, opportunities for analytical discussion, problem-based activities, international learning experiences, and the use of digital technologies. These qualitative observations may help explain why students from the two contexts reported different levels of confidence and educational exposure. Nevertheless, the qualitative findings should be regarded as contextual evidence rather than as proof of a direct causal relationship between particular institutional practices and students' cognitive competencies.

The findings have several implications for teacher education. First, teacher preparation programs may benefit from providing more systematic opportunities for reflective learning, problem-based tasks, analysis of multiple perspectives, and adaptive decision-making. Second, international and intercultural activities can be incorporated more consistently into teacher education curricula to strengthen students' preparedness for culturally diverse educational environments. Third, digital technologies, including interactive platforms, simulations, and adaptive assessment tools, can be integrated into teacher education not simply as technological resources but as instruments for active, reflective, and problem-oriented learning. Importantly, these recommendations should be considered as areas for pedagogical development rather than as evidence that one national education system is universally superior to another [9].

The comparative nature of the study also provides a basis for identifying potentially transferable educational practices. The higher levels of reported digital engagement and intercultural preparedness among the Chinese participants may indicate practices worthy of further investigation. However, transferability should be examined through curriculum-level and performance-based research rather than assumed from self-reported differences alone. Similarly, the comparatively lower scores reported by Kazakhstani participants should not be interpreted as evidence of deficiencies in the national teacher education system as a whole, because the sample represents selected institutions rather than the entire population of future educators in Kazakhstan.

Several limitations should be considered when interpreting the findings. First, although the revised quantitative sample includes 240 pre-service teachers, the participants were recruited from a limited number of pedagogical universities and therefore cannot be considered representative of all future teachers in Kazakhstan and China. Second, the study relies predominantly on self-reported measures, which may be influenced by self-perception, response tendencies, and cultural differences in evaluating one's own competencies. Recent research in teacher education similarly emphasizes that self-reported preparedness does not necessarily correspond to observed teaching practice or objectively assessed competence [10, pp. 69-74]. Third, the cross-sectional design prevents conclusions about changes in cognitive competencies

over time. Finally, differences between national groups may reflect institutional, curricular, cultural, technological, or demographic factors that were not fully controlled in the present study.

Future research should therefore combine self-report instruments with objective performance-based measures, such as standardized critical-thinking tasks, problem-solving assessments, teaching simulations, classroom observations, and portfolio-based evaluation. Longitudinal studies involving multiple pedagogical universities in both countries would also allow researchers to examine how cognitive and intercultural competencies develop throughout teacher education. Such research would provide stronger evidence for determining which educational practices are associated with the development of these competencies and whether the patterns identified in the present study are stable across institutions and educational contexts.

Overall, the study provides evidence of significant differences in the self-reported cognitive competencies and educational experiences of the participating pre-service teachers in Kazakhstan and China. The findings suggest potentially meaningful differences in cognitive adaptability, critical-thinking confidence, intercultural preparedness, and digital learning experiences. However, these results should be interpreted as context-specific comparative evidence rather than as proof that one national teacher education system is inherently more effective. A more cautious interpretation allows the study to identify areas for further investigation and possible pedagogical improvement while acknowledging the methodological limitations of self-reported and cross-sectional comparative research.

Conclusion. This study comparatively examined self-reported cognitive competencies among pre-service teachers in Kazakhstan and China across four dimensions: cognitive adaptability, critical-thinking and problem-solving confidence, intercultural competence, and digital learning experiences. The findings revealed statistically significant differences between the two groups, with Chinese participants reporting higher levels across the assessed dimensions.

These findings should be interpreted as differences in students' perceived competencies and educational experiences rather than as evidence of objectively higher cognitive abilities or the overall superiority of one national teacher education system. The results suggest that reflective learning, problem-based activities, intercultural experiences, and purposeful integration of digital technologies may represent important areas for further development in teacher education.

The study is limited by the use of predominantly self-reported measures, a cross-sectional design, and participants drawn from a limited number of pedagogical universities. Future research should employ larger and more diverse samples, longitudinal designs, and performance-based measures to further examine the development of cognitive competencies among future educators.

Conflict of interest: The authors declare no conflict of interest.

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Information about the authors:

Fang Yuqi – PhD student, Dalian University of Foreign Languages (China, Dalian, Liaoning Province), Abai Kazakh National Pedagogical University, Republic of Kazakhstan, 050010, Almaty, 30 Kazybek bi Str., tel.: +77762676320, e-mail: yuqifang128@gmail.com.

Kalimoldayeva Ardak Kenesbayevna* – Doctor of Pedagogical Sciences, Abai Kazakh National Pedagogical University, Republic of Kazakhstan, 050010, Almaty, 30 Kazybek bi Str., tel.: +77782210038, e-mail: ardak.kenesbay@gmail.com.

Abilmazhinova Oryngul Slyambekovna – PhD, Abai Kazakh National Pedagogical University, Republic of Kazakhstan, 050010, Almaty, 30 Kazybek bi Str., tel.: +77757226772, e-mail: oryngul.a72@mail.ru.

Li Yelena Dmitriyevna – Candidate of Pedagogical Sciences, Head of the Department of preschool and primary education, Akhmet Baitursynuly Kostanay Regional University, Republic of Kazakhstan, 110000, Kostanay, 47 Baitursynov Str., e-mail: li.d14@mail.ru.

Фан Юйци – PhD докторант, Далянь шет тілдер университеті (Қытай, Далянь қаласы, Ляонин провинциясы), Абай атындағы Қазақ ұлттық педагогикалық университеті, Қазақстан Республикасы, 050010 Алматы қ., Қазыбек би көш. 30., тел.: +77762676320, e-mail: yuqifang128@gmail.com.

Калимолдаева Ардак Кенесбаевна* – педагогика ғылымдарының докторы, Абай атындағы Қазақ ұлттық педагогикалық университеті, Қазақстан Республикасы, 050010 Алматы қ., Қазыбек би көш. 30., тел.: +77782210038, e-mail: ardak.kenesbay@gmail.com.

Абильмажинова Орынгуль Слямбековна – PhD, Абай атындағы Қазақ ұлттық педагогикалық университеті, Қазақстан Республикасы, 050010 Алматы қ., Қазыбек би көш. 30., тел.: +77757226772, e-mail: oryngul.a72@mail.ru.

Ли Елена Дмитриевна – педагогика ғылымдарының кандидаты, мектепке дейінгі және бастауыш білім беру кафедрасының меңгерушісі, Ахмет Байтұрсынұлы атындағы Қостанай өңірлік университеті, Қазақстан Республикасы, 110000 Қостанай қ., Байтұрсынов көш. 67, e-mail: li.d14@mail.ru.

Фан Юйци – PhD докторант, Даляньский университет иностранных языков (Китай, город Далянь, провинция Ляонин), Казахский национальный педагогический университет имени Абая, Республика Казахстан, 050010 г. Алматы, ул. Казыбек би 30., тел.: +77762676320, e-mail: yuqifang128@gmail.com.

Калимолдаева Ардак Кенесбаевна* – доктор педагогических наук, Казахский национальный педагогический университет имени Абая, Республика Казахстан, 050010 г. Алматы, ул. Казыбек би 30., тел.: +77782210038, e-mail: ardak.kenesbay@gmail.com.

Абильмажинова Орынгуль Слямбековна – PhD, Казахский национальный педагогический университет имени Абая, Республика Казахстан, 050010 г. Алматы, ул. Казыбек би 30., тел.: +77757226772, e-mail: oryngul.a72@mail.ru.

Ли Елена Дмитриевна – кандидат педагогических наук, заведующая кафедрой дошкольного и начального обучения, Костанайский региональный университет имени Ахмет Байтұрсынұлы, Республика Казахстан, 110000 г. Костанай, ул. Байтұрсынова 47, e-mail: li.d14@mail.ru.

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МОНОТІЛДІ БАЛАНЫҢ ПАЙДА БОЛМАУ СЕБЕПТЕРІ МЕН ШЕШУ ЖОЛДАРЫ

Шакенова М.Ж.* – PhD докторант, перминология бөлімінің кіші ғылыми қызметкері, Ш. Шаяхметов атындағы «Тіл-Қазына» ғылыми-практикалық орталығы, Астана қ., Қазақстан Республикасы.

Алпысбай Ә.Р. – PhD докторант, ғылыми қызметкер, «Bilim Innovations Group» жауапкершілігі шектеулі серіктестігі, Алматы қ., Қазақстан Республикасы.

Әбсадық А.А. – филология ғылымдарының докторы, Ахмет Байтұрсынұлы атындағы Қостанай өңірлік университеті, Қостанай қ., Қазақстан Республикасы.

Қазақстан аумағында монотілді баланың пайда болмауының көптеген факторлары бар: тарихи фактілер, қазіргі балалардың тұтынатын контенті және т.б. Зерттеудің негізгі өзектілігі – монотілді баланың пайда болмау себептерін нақты ажыратып, соның негізінде тиімді