International Journal of Instruction *October 2025 ● Vol.18, No.4*
e-ISSN: 1308-1470 ● www.e-iji.net *p-ISSN: 1694-609X*
pp. 651-668

Article submission code: 20250327095356
Received: 27/03/2025 Revision: 18/06/2025
Accepted: 25/06/2025 OnlineFirst: 07/07/2025

Comparing Critical Thinking Skills of Future Arts and Humanities Teachers in China and Kazakhstan

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This study examines the critical thinking abilities of aspiring teachers in the arts and humanities disciplines across two culturally distinct contexts: China and Kazakhstan. The research was conducted in 27 universities in Beijing, China, and 13 universities in Kazakhstan, involving a total of 636 teacher candidates (331 females and 305 males) aged between 20 and 60. A mixed-method research design was adopted, incorporating descriptive, analytical, and correlational approaches. Critical thinking was assessed using a researcher-developed instrument based on seven domains: Sensibility, Consciousness, Empathy, Adoption, Assumptions, Creativity, and Common Sense. The main objectives were to explore differences in critical thinking levels by age, gender, and cultural background; to compare low- and high-critical thinkers; and to identify which cognitive domains are most closely associated with strong critical thinking in each country. The main findings concluded that individual factors, including age, professional knowledge, and experience, were significantly related to critical thinking skills. The older participants scored higher on all domains of critical thinking. There were no statistically significant differences by sex or cultural background, so critical thinking appears to be a skill that any person can cultivate, regardless of demographic variables. These insights underscore the importance of targeted professional development in fostering critical thinking among future educators.

Keywords: teacher training institutes, education faculty, teacher candidates, critical thinking skills, humanities teachers

Citation: Li, Y., Shiri, M., Zhenghui, W., Assembaiuly, Y., Akbayeva, S., & Bekova, G. (2025). Comparing critical thinking skills of future arts and humanities teachers in China and Kazakhstan. *International Journal of Instruction*, *18*(4), 651-668. https://doi.org/10.29333/iji.2025.18435a

INTRODUCTION

Teachers' critical thinking skills and ways to improve them, as well as the factors that influence them, have long been of great interest to researchers. In some areas, case studies have been conducted (Iman, 2017; Aroonsiwagool et al., 2025). The development of critical thinking dispositions in teacher candidates is crucial to creating effective learning environments. Critical thinking is one of the most essential skills of teachers, as they are responsible for shaping the minds and souls of the next generation. Teachers regularly transfer what they have learned to their thinking patterns, approaches to problem-solving, and so on, based on decades of research. Hence, it is essential to assess the level of critical thinking skills the teacher candidates have developed so that they can effectively foster critical thinking in their future students. Critical thinking is widely recognized as one of the essential skills of the 21st century, particularly in the field of teacher education. As educators are expected to prepare students for complex, uncertain, and rapidly evolving global challenges, their ability to reason analytically, evaluate evidence, and approach problems from multiple perspectives becomes fundamental (Facione, 2011). In the disciplines of arts and humanities, where interpretation, reflection, and creative problem-solving are central, the need for strong critical thinking skills is even more pronounced. Teacher candidates in these fields are not only responsible for delivering content but also for modeling thoughtful inquiry and reflective judgment in their classrooms (Brookfield, 2012; Shiri & Baigutov, 2024b).

Despite its global importance, critical thinking does not develop uniformly across individuals or educational systems. Socio-cultural factors, pedagogical traditions, and institutional priorities all influence how critical thinking is taught, learned, and valued. In this context, cross-cultural research becomes crucial. Countries such as China and Kazakhstan offer compelling contrasts in educational philosophies—China, with its Confucian heritage and exam-oriented structure, and Kazakhstan, with its post-Soviet educational reforms and growing emphasis on learner-centered approaches (Marginson, 2011; Shiri & Baigutov, 2024a, 2024c). These differences can lead to variations in how future teachers perceive and cultivate critical thinking abilities.

Moreover, studies suggest that while some aspects of critical thinking are universal, others are shaped by culturally specific modes of reasoning and communication (Atkinson, 1997). Therefore, evaluating the essential thinking skills of aspiring teachers in these two distinct cultural and educational settings can provide deeper insights into the interplay between personal, academic, and cultural influences on cognitive development. By focusing on future educators in the arts and humanities from China and Kazakhstan, this study not only fills a gap in comparative educational research but also contributes to the development of more culturally responsive teacher training models.

This study aims to evaluate the significance of critical thinking skills among teacher candidates by assessing the levels of critical thinking in its seven subdomains. The assessment will provide a comprehensive understanding of the overall critical thinking proficiency among teacher candidates, which can help identify areas that require further development in teacher education programs. Additionally, the study aims to explore

potential differences in critical thinking skills among teacher candidates based on various factors, including cultural differences, age group, and gender. Furthermore, investigating critical thinking skills across diverse cultural backgrounds will result in a more comprehensive understanding of how cultural forces influence the development of critical thinking skills. Additionally, exploring potential differences based on gender and age group may reveal variations in essential thinking skills among teacher candidates and target areas that may require focused intervention or different training approaches. The conceptualization of literature, along with suggestions from various authors working in this research domain, led to the formulation of the following research questions.

Problem statement

Critical thinking is a key competency for future educators, particularly in the arts and humanities, where interpretative, reflective, and creative skills are essential. However, there is limited research comparing how aspiring teachers from different cultural and educational systems, such as those in China and Kazakhstan, develop and express critical thinking abilities. These two countries offer contrasting socio-cultural and pedagogical environments, making them ideal for a comparative analysis.

Furthermore, it remains unclear how critical thinking varies across age, gender, and levels of experience and what differentiates low-critical thinkers from high-critical thinkers within such culturally distinct populations. While previous research often focuses on Western educational settings, there is a growing need to explore how critical thinking evolves in non-Western, multicultural contexts.

This study addresses the following research questions:

- What distinguishes low-critical thinkers from high-critical thinkers among aspiring teachers in China and Kazakhstan?
- Are there significant gender-based differences in critical thinking abilities across both countries?
- How does age influence the level of critical thinking skills in these culturally diverse educational systems?
- To what extent do cultural backgrounds—particularly those of Chinese and Kazakhstani students—influence the development of critical thinking?
- Which of the seven domains (Sensibility, Consciousness, Empathy, Adoption, Assumptions, Creativity, and Common Sense) are most strongly associated with higher levels of critical thinking in Chinese and Kazakhstani pre-service arts and humanities teachers?

By examining these questions, the study aims to provide a nuanced understanding of the development of critical thinking among future arts and humanities educators.

Objectives

This study is designed with the following objectives in mind:

- To compare the critical thinking profiles of low- and high-critical thinkers among aspiring arts and humanities teachers in China and Kazakhstan.

- To examine whether gender-based differences in critical thinking are consistent or vary between the two cultural contexts.

- To investigate how age affects critical thinking skill levels across various stages of educational and professional development in both countries.

- To assess the impact of cultural and educational environments in China and Kazakhstan on the development of critical thinking abilities.

- To identify which of the seven domains (Sensibility, Consciousness, Empathy, Adoption, Assumptions, Creativity, and Common Sense) show the strongest correlation with critical thinking in each country.

To contribute to a cross-cultural understanding of critical thinking that can inform teacher training programs in diverse global contexts

Literature

Although teacher education worldwide is increasingly focusing on critical thinking, most existing studies have only examined Western educational systems or limited their scope to a single country. A significant deficiency exists in cross-cultural research examining the development of critical thinking skills among prospective teachers in various non-Western contexts. China and Kazakhstan, with their varied cultural values, educational backgrounds, and teaching traditions, present a distinctive comparative framework for examining this issue. Nevertheless, comparative analyses regarding teacher candidates' critical thinking skills in these two countries are limited. This study examines both common and divergent patterns in the critical thinking practices of prospective arts and humanities educators, thereby fulfilling a pressing need to contextualize global teacher education research and provide novel insights from underrepresented regions.

The concept of critical thinking has been the subject of extensive research in the field of education. Facione's (1990) Delphi Report characterizes critical thinking as "purposeful, self-regulatory judgment," which includes fundamental cognitive skills such as interpretation, analysis, evaluation, inference, and explanation, as well as related dispositions like open-mindedness and intellectual humility. Ennis (1985) defines critical thinking as a combination of cognitive skills and a mindset that includes clarity, logic, and relevance when making decisions. Paul and Elder (2006) assert that critical thinking constitutes the practice of scrutinizing and enhancing one’s cognitive processes through methodical reasoning. These frameworks constitute the theoretical foundation of the present study and guided the design of the seven-domain model employed to assess participants' competencies, encompassing sensibility, consciousness, empathy, adoption, assumptions, creativity, and common sense.

The Educational Value of Critical Thinking for Prospective Teachers

Critical thinking skills among prospective teachers have gained considerable attention among researchers in the 21st century (Kavenuke, Kinyota, & Kayombo, 2020). In this context, numerous studies have been conducted to evaluate the significance of critical thinking for teachers, as well as the process of developing critical skills (Kozikoglu, 2019; Wahyudi et al., 2019; Soysal & Soysal, 2023; Rodriguez & Kitchen, 2004). Knowledge acquisition through education and the development of experience are essential factors in cultivating critical thinking abilities in prospective teachers, as they significantly influence the creation of conducive learning environments. Different scholars have explored the association between teachers' level of knowledge and its impact on students' performance (e.g., Metzler & Woessmann, 2012; Sadler et al., 2013; Fauth et al., 2019). Therefore, it is essential to identify the patterns that emerge in the development of critical thinking skills among teacher candidates and to focus on these traits during the teaching and learning process. Improving skills in critical thinking is considered essential for education and student growth. It thus can be identified as a foundation that should be incorporated into curriculum programs and educational tasks (Van Der Zanden et al., 2020).

Practical Relevance and Cognitive Foundations of Critical Thinking

Practical professions should provide the world with powerful critical thinking abilities, which are essential in the context of operating in variable environments and making logical decisions in new situations (Turan et al., 2019; Penkauskienė et al., 2019). The importance of critical thinking in teaching contexts and the substantial impact of teachers' skills on the development of critical thinking are well acknowledged. As a result, numerous related studies have been conducted in the field with practicing and prospective educators (e.g., Alsaleh, 2020; El Soufi & See, 2019; Kozikoglu, 2019). The philosophical perspectives on cognitive (thinking) processes formed the basis for the theory of critical thinking. The elements that comprise the core of critical thinking are analysis, interpretation, self-regulation, inference, explanation, and evaluation (Facione, 2011). Higher-order thinking skills are described as including critical thinking, creative thinking, analytical thinking, reflective thinking, and problem-solving skills, which denote the requirement to teach creative and critical thinking abilities as essential components of these higher-order skills (Akpur, 2020; Hasançebi et al., 2021).

Characteristics of Critical Thinkers and the Role of the Arts

Critical thinking refers to the collection of skills individuals employ to assume responsibility for their thinking and decision-making (Finn, 2011). Individuals lacking essential thinking skills struggle to discern the rationale and purpose of their actions. When confronted with conflicting ideas, they tend to silence those who advocate for opposing viewpoints and exhibit a reluctance to innovate or break free from established patterns (Lantian et al., 2021). Such individuals cannot genuinely engage in constructive and creative processes. Moreover, effective critical thinkers maintain skepticism until evidence is presented, articulate questions, problems, or claims effectively, refrain from impulsive actions, and willingly conduct thorough research while providing sound

reasoning and evidence to support their assertions. They obtain and assess knowledge independently, which is a key requirement for positive development and evolution. Thus, the importance of encouraging critical thinking skills in learning and teaching settings is growing. Education is considered a powerful vehicle to meet this need. Such creativity in terms of ideas, methodologies, and the teaching of the subject area itself, through critical thinking, makes the arts and humanities discipline an integral component of this educational domain (Goodchild & Janelle, 2010; Belluigi, 2018).

METHOD

Research Design and Instruments

In this study, a mixed-methods design was employed to examine critical thinking skills among prospective faculty in the arts and humanities, utilizing descriptive-analytical and correlational methods. The instrument used to measure essential thinking skills was developed by the author based on prior conceptual frameworks and theoretical literature in the field of critical thinking. It includes 42 items distributed across seven categories identified as key dimensions of critical thinking in educational settings: Sensibility, Consciousness, Empathy, Adoption, Assumptions, Common Sense, and Creativity. These domains were derived and refined through a synthesis of previous theories and adapted to reflect the specific context of arts and humanities education. The questionnaire was validated through expert consultation in education and psychology, and responses were measured using a five-point Likert scale.

(1) Strongly Disagree, (2) Disagree, (3) Neither Agree Nor Disagree, (4) Agree, and (5) Strongly Agree.

Mean scores of 4.00 or above were classified as high, indicating strong critical thinking skills;

Scores between 3.00 and 3.99 were considered moderate, and scores below 3.00 were classified as low, indicating areas that needed further development. Before data collection, a pilot test was conducted to ensure internal reliability and clarity of items.

This study strictly adhered to the ethical research standards outlined in international academic guidelines. Informed consent was obtained from all participants before data collection. Participants were informed about the purpose of the study, their right to withdraw at any time, and the confidentiality of their responses. The research protocol and ethical procedures were reviewed and approved by the Ethics Committee of Abai Kazakh National Pedagogical University. Official ethical clearance was granted through formal documentation (Approval No. 34, dated March 27, 2024). Additionally, the data collection process adhered to the data protection policies of the participating universities in Kazakhstan and China, ensuring the anonymity and secure handling of data throughout the research.

Participants

The study was conducted in two geographical regions:

Beijing Province, China, where participants were drawn from 27 universities with a focus on departments of education and arts.

Kazakhstan, where teacher candidates from 13 universities across the country were included. A total of 636 aspiring teachers participated in the study, comprising 331 females and 305 males. The participants were aged between 20 and 60 years and grouped into three main age brackets (20–30, 31–45, and 46–60) for comparative analysis. All participants were either enrolled in or recent graduates of teacher training programs within faculties of education.

Data Collection and Analysis

The data was collected online using a secure survey platform. The questionnaire was distributed through institutional email systems and official student networks in both China and Kazakhstan, ensuring anonymity and voluntary participation.

Once data collection was complete, responses were compiled and cleaned for analysis. Statistical analysis was performed using SPSS software (version XX), where descriptive statistics (means, standard deviations) were calculated alongside ANOVA and correlation tests to determine relationships among variables and between demographic subgroups. The mean scores served as the primary indicator of critical thinking competency, with domain-specific analysis providing deeper insight into the strengths and weaknesses of different respondent groups across both countries.

Validity and Reliability

Both content validity and construct validity were thoroughly assessed to validate the research instrument for researchers in terms of quality and trustworthiness. A panel of five academic experts in the fields of education, educational psychology, and teacher training reviewed the questionnaire. The feedback was then used to refine the wording of items, eliminate vagueness, and ensure that each item accurately reflected its corresponding facet of critical thinking. The total Cronbach's alpha coefficient for the questionnaire was found to be 0.82, indicating high reliability.

FINDINGS

Demographic Characteristics

This study included 636 prospective educators enrolled in arts and humanities programs at teacher education institutions in Kazakhstan and China. There were 331 women (52%) and 305 men (48%), representing nearly equal numbers of each gender. There were four age groups among the participants: 21.6% were 20 to 30 years old, 50.1% were 31 to 40 years old, 19.8% were 41 to 50 years old, and 8.3% were 51 to 60 years old. There were 232 participants (36%) from Kazakhstan and 404 participants (64%) from China.

All participants were enrolled in undergraduate or graduate programs designed to prepare them to teach the arts and humanities, including music, visual arts, cultural studies, literature, and history. These individuals were at various stages in their academic careers, but they all expressed a desire to become teachers upon completing their education. They were included because they were available, agreed to do so, and were currently enrolled in pedagogical universities (Table 1).

Table 1
Demographic characteristics

	Factor	Number of participants	Percentage
Gender	Male	305	48%
	Female	331	52%
aage	20-30	138	21.6%
	31-40	319	50.1%
	41-50	126	19.8%
	51-60	53	8.3%
Country	Kazakhstan	232	36%
	China	404	64%
Total	Total	636	

The choice of Kazakhstan and China as research sites was intentional. These two countries represent distinct cultural and educational traditions, offering a valuable context for comparison. Kazakhstan, with its ongoing post-Soviet reforms, and China, with its Confucian heritage and centralized education policies, offer contrasting frameworks for teacher development. Exploring critical thinking skills within such diverse educational systems contributes to a deeper understanding of how context influences pedagogical competencies.

Table 2 presents the descriptive statistics regarding the critical thinking skills of future teachers from China and Kazakhstan. The mean scores indicate that future teachers who possess higher critical thinking skills are more potent in sensibility, consciousness, empathy, adaptability, critical thinking, common sense, and creativity compared to those who are weak in critical thinking skills. We grouped scores from participants and found that the main characteristic of higher-level essential thinkers is sensibility ($\bar{x}$ = 5.9969). In contrast, the common sense score ($\bar{x}$ = 3.8192) was moderate, indicating that critical thinking does not relate to higher common sense. Similarly, participants low in critical thinking possess a lower level of creativity ($\bar{x}$ = 3.4843) and a lower level of consciousness ($\bar{x}$ = 1.79351) compared to participants with high levels of critical thinking skills (Table 2).

Table 2
Descriptive statistics critical thinkers

Value	high-critical thinkers			low-critical thinkers			Cronbach Alfa
Factor	N	Mean	Std. Deviation	N	Mean	Std. Deviation	
Sensibility	420	5.99	1.09	216	3.81	2.34	
Consciousness	420	4.04	1.44	216	3.95	1.79	
Empathy	420	5.06	1.38	216	3.93	2.14	0.82
Adoption	420	4.03	1.45	216	3.52	1.70	
Assumptions	420	4.05	1.84	216	3.47	2.12	
Common sense	420	3.81	2.34	216	3.30	1.99	
Creativity	420	4.94	1.87	216	3.48	1.60	
Valid N	636			216			

Table 3 provides the descriptive statistics of critical thinkers by gender. The overall patterns of mean scores do not show a significant difference; however, a slight difference in scores indicates that female future teachers possess more conscious skills ($\bar{x}$ = 5.6579) compared to the male mean score of ($\bar{x}$ = 4.8158).

In addition, the score ($\bar{x}$ = 4.5526) indicates that females exhibit a more substantial empathy dimension than males ($\bar{x}$ = 4.000). The ordinary sense dimension reached a mean of 2.6316 for female critical thinkers, which was lower than that of male critical thinkers ($\bar{x}$ = 3.2105). As a result, there is an apparent difference in the scores between male and female future teachers, which shows an inverse relationship between the emotional component of people, as women tend to approach it differently than men (Table 3).

Table 3
Descriptive statistics gender-wise

Value	Male participants			Female participants			Cronbach Alfa
Factor	N	Mean	Std. Deviation	N	Mean	Std. Deviation	
Sensibility	305	5.81	1.37	331	5.73	1.28	
Consciousness	305	4.81	1.33	331	5.65	1.51	
Empathy	305	4.00	1.62	331	4.55	1.91	
Adoption	305	5.23	2.36	331	5.36	2.00	0.79
Assumptions	305	4.00	1.41	331	3.73	1.81	
Common sense	305	3.21	1.09	331	2.63	1.10	
Creativity	305	5.28	1.37	331	4.94	0.83	
Valid N	305			331			

Table 4 presents the statistics regarding critical skills. The results show that, overall, with increasing age, the dimensions of critical skills decrease. For example, the mean score $\bar{x}$ = 5.8158 increases up to the age group 41-50, corresponding to a mean score $\bar{x}$ =. However, in the 51-60 age group, it decreases to $\bar{x}$ = 4.0263. Similarly, the creativity dimension mean score $\bar{x}$ = 4.2895 in the age group 20-30 increased to $\bar{x}$ =4.7526 in the

age group 31-40 to $\bar{x}$ =5.9211 in the age group 41-50, whereas a similar decreasing trend in the age group 51-60 as mean score $\bar{x}$ =2.2368. Overall, a similar pattern was observed across the data, showing that critical skills development continues through the age group 20-50, whereas in the age group 51-60, it begins to decrease (Table 4).

Table 4
Descriptive statistics – age-wise

Factor	N	Mean	Std. Deviation	N	Mean
Sensibility	636	5.81	4.50	5.95	4.02
Consciousness	636	4.81	4.93	5.05	3.55
Empathy	636	4.00	4.02	4.05	3.97
Adoption	636	4.23	5.55	5.73	4.55
Assumptions	636	4.00	4.97	5.42	3.05
Common sense	636	3.21	5.55	5.81	2.05
Creativity	636	4.28	4.75	5.92	2.23
Valid N	636				

The cultural mean scores of the two countries are reported in Table 5, indicating that there is no significant difference between the high critical thinkers from the two countries. In the sensitivity dimension, however, the overall mean score of Chinese high critical thinkers was 5.9767, while Kazakhstan's score was only 4.6279. The same trends were observed in the other six dimensions of critical thinking (Table 5).

Table 5
Descriptive statistics – cultures

Value	Chinese participants			Kazakh participants			Cronbach Alfa
Factor	N	Mean	Std. Deviation	N	Mean	Std. Deviation	
Sensibility	404	5.97	1.12	232	4.62	1.86	
Consciousness	404	4.04	1.43	232	3.79	2.35	
Empathy	404	5.00	1.39	232	4.90	1.91	
Adoption	404	4.18	1.69	232	4.53	2.09	0.75
Assumptions	404	4.32	1.49	232	4.18	2.33	
Common sense	404	4.88	1.72	232	4.53	1.77	
Creativity	404	5.97	1.12	232	4.62	1.86	
Valid N	404			232			

Table 6 provides the statistics on one-way ANOVA, according to the prospective teacher's age factor and its impact on the level of criticism in terms of its seven dimensions, we can observe the statistically significant difference ($p<0.05$) between groups as sensibility domain f (190.155; $p<0.05$); consciousness f(8.347;$p<0.05$); empathy f(80541;$p<0.05$); adoption f(3162.897; $p<0.05$); assumption f(350.375; $p<0.05$); creativity f(105.982; $p<0.05$); common sense f(614.566; $p<0.05$). Applying Scheffé's significance test, groups were identified that showed significant differences. For instance, it was noted that critical skills are related to the formation of seven key domains, including increased sensitization (the quality of responding when exposed to complicated emotional or aesthetic influences). This brings heightened perceptiveness or responsiveness, and therefore, increased critical thinking abilities. Furthermore, the

second domain of awareness pertains to the individual's awareness and comprehension of their environment. This domain is related to domain expertise and progress; the more engaged a person is in their domain, the more important skills they will possess. Furthermore, empathy is closely tied to the emotional aspect; when an individual has a higher level of emotional understanding, it leads to better critical thinking skills. Generally, females are considered high in the emotional domain; however, this aspect needs to be explored scientifically. The fourth domain, "adoption," refers to a person's ability to adapt to various environments, cultures, and individuals. The more flexible and extroverted a person is, the more likely they are to possess critical thinking skills. The fifth domain is an assumption, which in this context is applied when developing logical arguments or suggestions based on his experience and knowledge. The more experienced and knowledgeable a person is, the more they will develop critical thinking skills. The sixth dimension, "creativity," refers to the teacher's ability to generate innovation in teaching style and knowledge development. Higher skills in critical thinking lead to greater creativity. The last dimension, "common sense," refers to a teacher's ability to utilize their knowledge, skills, and experiences in an organized manner to develop an understanding of an event, situation, concept, or other relevant topic (Table 6).

Table 6
One-way ANOVA

variable				Sum of Squares	df	Mean Square	F	Sig.
Sensibility	Between Groups	(Combined)		374.831	3	124.944	190.155	.000*
		Linear Term	Weighted	135.828	1	135.828	206.720	.000*
	Total			564.065	291			
Consciousnes	Between Groups	(Combined)		40.049	3	124.944	8.347	.000*
		Linear Term	Weighted	7.847	1	135.828	4.906	.000*
	Total			500.668	291			
Sensibility	Between Groups	(Combined)		324.293	3	108.098	80.541	.000*
		Linear Term	Weighted	88.222	1	88.222	65.732	.000*
	Total			710.832	291			
Sensibility	Between Groups	(Combined)		1558.664	3	519.555	3162.897	.000*
		Linear Term	Weighted	290.516	1	290.516	1768.577	.000*
	Total			1605.973	291			
Sensibility	Between Groups	(Combined)		443.034	3	147.678	350.375	.000*
		Linear Term	Weighted	15.214	1	15.214	36.096	.000*
	Total			564.421	291			
Sensibility	Between Groups	(Combined)		270.311	3	90.104	105.982	.000*
		Linear Term	Weighted	8.884	1	8.884	10.450	.001*
	Total			515.164	291			
Sensibility	Between Groups	(Combined)		302.856	3	100.952	614.566	.000*
		Linear Term	Weighted	44.946	1	44.946	273.616	.000*
	Total			350.164	291			

* $p < 0.05$; Critical Thinking Skills.

DISCUSSION

The current study aimed to evaluate the critical thinking skills of prospective teachers in the arts and humanities across seven domains: Sensibility, Consciousness, Empathy, Adoption, Assumptions, Creativity, and Common Sense. The results of the ANOVA confirmed statistically significant differences between age groups within all seven-dimensional constructs, indicating that the development of critical thinking is a multidimensional process involving cognitive, emotional, and experiential factors.

A particularly notable finding was the stronger performance of older participants across all dimensions of critical thinking. This suggests that critical thinking can be viewed not only as a learned skill but also as one that develops with age, experience, and professional exposure. In domains such as Adoption and Assumptions, older participants demonstrated more flexibility, self-awareness, and the ability to rationalize

through lived experiences. Similarly, their elevated scores in Sensibility and Empathy suggest a greater capacity to recognize emotional and aesthetic subtleties, highlighting the role of emotional intelligence in the development of critical thinking.

Findings from descriptive statistics (Table 2) revealed that high-critical thinkers consistently outperformed their low-critical counterparts across nearly all seven domains. The most pronounced characteristic among high performers was sensibility, with a mean score of $\bar{x} = 5.9969$, indicating a heightened awareness and responsiveness to subtle emotional and situational cues. This was followed by high scores in consciousness and empathy, suggesting that advanced critical thinkers possess a well-developed sense of reflection and interpersonal sensitivity. In contrast, low-critical thinkers exhibited significantly lower scores in consciousness ($\bar{x} = 1.79351$) and creativity ($\bar{x} = 3.4843$), implying weaker self-awareness and a limited ability to approach problems innovatively. Interestingly, common sense, often perceived as a practical indicator of reasoning, showed only moderate levels ($\bar{x} = 3.8192$) even among high-level critical thinkers, suggesting that this domain may function more independently from other higher-order cognitive traits.

In terms of gender-based differences (Table 3), while the overall trends did not indicate statistically significant gaps, notable variations were observed in specific dimensions. Female participants scored higher in consciousness ($\bar{x} = 5.6579$) and empathy ($\bar{x} = 4.5526$) compared to their male counterparts ($\bar{x} = 4.8158$ and $\bar{x} = 4.000$, respectively). These findings suggest that female future teachers may be more attuned to emotional intelligence and reflective thinking, potentially due to socialization patterns or educational exposure. However, in the ordinary sense domain, male participants scored higher ($\bar{x} = 3.2105$) than females ($\bar{x} = 2.6316$), hinting at a practical orientation in male respondents. This inverse relationship between emotional awareness and practical reasoning suggests that gender-related cognitive styles may influence the expression of specific critical thinking traits, even when overall competence remains balanced.

Creativity and Common Sense were identified as the strongest indicators of applied critical thinking across the sample. Creativity was closely linked to the ability to approach problems from innovative perspectives, while Common Sense reflected the practical integration of knowledge in real-life contexts. These domains were particularly pronounced among high-critical thinkers, implying that targeted development of creativity in teacher education can significantly enhance overall critical thinking capacity (Padget, 2012).

Finally, contrary to initial expectations and previous literature (e.g., Saroyan, 2022), cultural background—whether Chinese or Kazakhstani—was not a significant predictor of critical thinking performance. This result suggests that critical thinking is a universal cognitive competency that can be fostered in diverse educational systems. However, it is essential to acknowledge that culture may still exert an indirect influence, affecting factors such as access to quality education, pedagogical traditions, and societal attitudes toward critical inquiry.

CONCLUSION

The findings of this research provide valuable insights into the characteristics of the structure and the development of critical thinking skills among future arts and humanities teachers. The results confirm that critical thinking is a multi-domain process, with each domain—Sensibility, Consciousness, Empathy, Adoption, Assumptions, Creativity, and Common Sense—contributing uniquely to the formation of thoughtful, reflective educators. As a significant factor, the role of age suggests that developing critical thinking is a gradual and cumulative process, signifying the experience and maturity gained through years of academic and professional exposure in teacher education programs.

Moreover, the lack of a statistically significant influence from cultural background underscores the universal nature of critical thinking, suggesting that it can be nurtured across diverse national contexts when supported by appropriate pedagogical strategies and curriculum design. While no significant gender-based differences were found overall, the data revealed that female participants showed higher levels of empathy and consciousness. In contrast, male participants scored slightly higher in common sense, suggesting subtle but noteworthy differences in how emotional and practical reasoning are expressed.

In addition, the comparison between low- and high-critical thinkers revealed that those with higher critical thinking ability exhibited significantly stronger scores in domains such as Sensibility, Creativity, and Consciousness. In contrast, those with lower scores showed noticeable deficiencies in areas such as empathy and Adaptation. These distinctions point to the need for targeted interventions that address specific cognitive and emotional competencies.

To summarize, the research emphasizes the importance of incorporating diverse pedagogical strategies in teacher education programs that promote emotional intelligence, adaptability, creativity, and practical reasoning. This is accomplished through curricula that not only provide content knowledge but also explicitly cultivate critical thinking in all its forms—across subject areas and through interdisciplinary approaches. Such preparation will empower future educators to foster thoughtful and responsible learners, contributing meaningfully to educational reform and innovation.

RECOMMENDATION

The development of critical thinking among future educators, particularly in the arts and humanities, is a dynamic and complex process that demands ongoing self-reflection and targeted support. Given the high cognitive and creative demands of art education, it is essential to investigate how various demographic and contextual factors influence the cultivation of critical thinking. Future research should employ more nuanced and inclusive methodologies to deepen our understanding of how critical thinking manifests and evolves among aspiring teachers from diverse backgrounds and experiences.

- Explore gender-based differences in critical thinking to identify specific domains where male and female teacher candidates may require differentiated support or resources.

- Examine age-related variations in the development of critical thinking to gain a deeper understanding of how maturity and life experience influence crucial reasoning and decision-making skills.
- Investigate the role of educational background, such as prior training in the arts or humanities, in shaping the depth and breadth of critical thinking abilities.
- Adopt a multicultural research framework to examine how cultural context, values, and communication styles influence the development and expression of critical thinking in educational settings.
- Focus on longitudinal research designs to track the progression of critical thinking skills over time, particularly through teacher training programs and early career teaching experiences.
- Assess the impact of specific pedagogical interventions (e.g., reflective journaling, inquiry-based learning, or collaborative projects) on enhancing critical thinking in art education.

These research directions will contribute to a more prosperous and more equitable understanding of how critical thinking skills can be effectively nurtured in diverse educational contexts.

ACKNOWLEDGMENTS

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Funding

The authors declare that no funds, grants, or other support were received during the preparation of this manuscript.

Competing Interest Declaration

No competing interests declared. The authors declare no relevant financial or non-financial interests.

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