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Predictors of teachers' readiness for inclusive education in Kazakhstan

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Article Info

ABSTRACT

Inclusive education (IE) is increasingly recognized as a key priority in modern educational systems; however, in Kazakhstan, there is limited evidence on the factors influencing teachers' attitudes and readiness to implement it. This study explores public school teachers' attitudes toward inclusive education (TATIE) and examines how personal, professional, and institutional factors affect these attitudes. A survey of 638 teachers from Almaty schools was conducted using a validated instrument, and correlation and regression analyses were employed to identify significant predictors. The results indicate that gender, teaching experience (TE), frequency of contact with students with disabilities (SWD), perceived school support, and participation in specialized training significantly influence teachers' attitudes. Positive attitudes were particularly associated with direct professional experience and strong institutional support, highlighting the importance of targeted professional development and school-level measures. This study contributes to the literature by providing a comprehensive quantitative analysis specific to the Kazakhstani context and offers practical insights to guide policy and enhance the effective implementation of inclusive practices, ultimately improving the quality of education for students with special educational needs.

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1. INTRODUCTION

Inclusive education (IE) is now recognized as a key area in the development of educational systems worldwide. Many countries are actively working to include such students in general education schools [1], [2]. Research shows that the success of inclusion largely depends on teachers' attitudes, their level of professional training, and their perception of organizational and administrative support from the school [3]. Recently, greater attention has been given to the factors that influence teachers' readiness to adopt inclusive practices [4]. In Kazakhstan, IE has become a national priority, supported by international conventions and the law "on education", which guarantees equal access to learning opportunities [5]–[7]. Over the past decade, the country has made visible progress in expanding inclusive infrastructure; however, significant challenges remain [8]–[10].

Despite these advancements, IE in Kazakhstan is still in the early stages of development [11]. Key challenges include limited teacher training, inconsistencies in the adoption of inclusive values, and the absence of a unified theory or practice across schools. Research indicates that teacher attitudes are among the most important predictors of successful inclusion [12]. Even with policy support and resources, negative or hesitant attitudes can lead to superficial or ineffective implementation [13]. However, little is known about how Kazakhstani teachers perceive IE and which factors shape their attitudes.

There is still a shortage of empirical data on teachers' views on IE in the Kazakh academic context [14], [15]. Most domestic publications focus on the analysis of the regulatory framework, infrastructural constraints, or the overall level of inclusiveness of educational institutions, while teachers' subjective perceptions of their readiness and attitudes toward IE often remain overlooked [16]. In addition, no large-scale quantitative attempts have been made to compare teachers' attitudes with variables such as age, teaching experience (TE), special training, frequency of interaction with students with disabilities (SWD), and the degree of support from the administration [17]–[20]. There is growing academic interest in identifying which individual and institutional factors contribute to the development of positive or cautious attitudes toward inclusion [21].

Two clear gaps can be identified in the existing studies. First, there are no integrated models capable of quantitatively assessing the combined impact of teacher characteristics on their attitudes toward IE. Second, there is a shortage of validated tools adapted to the socio-cultural context of Kazakhstan. This complicates the development of effective professional training and continuing education programs based on the real needs of teachers. Given the growing introduction of IE elements into mainstream schools, especially in large cities such as Almaty, the need for applied and methodologically sound analysis is becoming especially urgent. The data obtained not only complements the existing body of research but also has high practical potential for the development of targeted measures in educational policy, methodological support, and teacher professional development in Kazakhstan. To address this issue, the following research question was formulated:

– How do personal factors influence public school teachers' attitudes and readiness toward IE in Kazakhstan?
– How do professional and institutional factors influence public school teachers' attitudes and readiness toward IE in Kazakhstan?

This study aims to explore public school teachers' attitudes toward inclusive education (TATIE) and to determine how personal, professional, and institutional factors influence these attitudes.

2. METHOD

2.1. Study design

This study employed a quantitative, cross-sectional survey design to examine the factors influencing TATIE [22]. A cross-sectional design involves collecting data at a single point in time, enabling the assessment of both predictor variables (e.g., experience, training, institutional support) and outcome variables (e.g., attitudes) simultaneously. This approach allows for the identification of associations between variables within a defined population without manipulating the study environment.

2.2. Research settings

The study was conducted in Almaty, a major urban center in southern Kazakhstan. The city has 337 schools, including 215 public and 122 private institutions. Five public, mixed-language secondary schools were purposively selected based on three criteria: i) active enrollment of SWD; ii) linguistic diversity, with instruction in both Kazakh and Russian; and iii) representation of varied socio-economic backgrounds among students.

Each school enrolled approximately 800–1,200 students, with average class sizes ranging from 22 to 30. SWD—primarily those with physical, sensory, or developmental impairments—comprised an estimated 5–7% of the population. The selected schools differed in their level of inclusive infrastructure, ranging from well-resourced support rooms and teaching assistants to more limited provisions. This variation allowed for the examination of a wide spectrum of inclusion practices within public urban schools. Additionally, because the schools serve neighborhoods with both middle- and lower-income families, they provided a richer context for understanding the factors that may influence TATIE.

2.3. Sampling

Participants were recruited through the Almaty City Department of Education. Information letters were first sent to school administrations, and after receiving approval, invitation letters were distributed to eligible teachers. The inclusion criteria required participants to: i) hold at least a diploma in IE; ii) have a minimum of five years of TE; and iii) provide informed consent.

A total of 648 teachers participated in the study. After screening for completeness and response quality, data from 638 teachers were retained for the final analysis. The sample included teachers across different age groups, grade levels, and professional experience. Participation was voluntary and anonymous.

The majority of participants were female (n=456), while 182 were male. The Almaty City Department of Education regularly provides professional development opportunities, including refresher courses on IE. These programs allow participating teachers to take study leave from their regular duties, thereby facilitating access to training. Table 1 presents the socio-professional characteristics of teachers in the context of IE.

Table 1. Socio-professional characteristics of teachers in the context of IE

Category		Frequency (n)	Percentage (%)
Gender	Male	182	28.5
	Female	456	71.5
Age	Under 30	38	6.0
	30–35	169	26.5
	36–41	212	33.2
	42–52	143	22.4
	53 and above	76	11.9
TE	Less than 5 years	71	11.1
	5–10 years	158	24.8
	11–20 years	234	36.7
	More than 20 years	175	27.4
Taught students with SWD	Yes	371	58.1
	No	267	41.9
Frequency of direct contact with SWD	Daily	91	14.3
	Weekly	143	22.4
	Occasionally	256	40.1
	Never	148	23.2
Received training in IE	Yes	279	43.7
	No	359	56.3
Perceived school support for inclusion	Very high	47	7.4
	High	111	17.4
	Moderate	244	38.3
	Low	166	26.0
	Very low	70	11.0

2.4. Procedure

Prior to data collection, all participants were informed about the purpose of the study and provided informed consent, either digitally or in writing, depending on the mode of questionnaire distribution. The survey was conducted over a two-month period using a cross-sectional design. To ensure accessibility, the questionnaire was made available in both Kazakh and Russian. A pilot test involving 25 teachers was carried out to assess the reliability and clarity of the items. Based on feedback, minor revisions were made to improve clarity and contextual relevance. A mixed-mode distribution strategy was employed to maximize participation. In schools with reliable internet access, the questionnaire was distributed electronically via email and professional networks. In schools with limited or no connectivity, printed copies were distributed and collected by designated school coordinators. Each participant received an information sheet outlining the study's purpose, procedures, participant rights, and guarantees of anonymity and confidentiality. To support a high response rate, the research team worked in close coordination with regional education departments and school administrators. Periodic reminders were sent to encourage timely completion of the survey.

2.5. Instruments

The instrument consisted of 10 Likert-scale statements designed to evaluate teachers' attitudes and readiness for IE. Both positively and negatively phrased items were included to ensure response reliability, with reversed items clearly indicated. Content validity was established through expert review by three specialists in IE, who evaluated the items for clarity, relevance, and alignment with the study objectives. Construct validity was further supported by consistency with previously validated instruments used in similar contexts. Reliability analysis of the pilot data (n=25) demonstrated good internal consistency, with a Cronbach's alpha coefficient of 0.82. The survey items are presented in Table 2.

2.6. Data analysis

Descriptive statistics were used to summarize the demographic characteristics of the sample and the distribution of key study variables. Inferential analyses included Chi-square tests for categorical variables and

t-tests or one-way analysis of variance (ANOVA) for continuous variables to assess group differences. Correlation analysis was applied to examine the strength and direction of relationships between variables. Multiple regression analysis was conducted to determine the extent to which independent variables predicted the dependent variable—teachers' attitude scores toward IE. This approach allowed for the identification of statistically significant predictors while controlling for potential confounding factors.

Table 2. Survey instrument for assessing teachers' attitudes and readiness for IE

Statement
1. IE is beneficial for all students.
2. I feel prepared to teach SWD.
3. Including SWD makes classroom management more difficult. *(reverse)*
4. I am willing to adapt my lessons to accommodate all learners.
5. My school supports me in implementing inclusive teaching practices.
6. SWD should be taught in special schools. *(reverse)*
7. I have the resources and materials needed to support IE.
8. Training in IE improves teaching effectiveness.
9. I enjoy working with students who have diverse needs.
10. IE fosters tolerance and understanding among students.

3. RESULTS

Table 3 presents the cross-tabulation of gender and prior TE with SWD. The results show that both male and female teachers included individuals with and without such experience. However, the proportion of female teachers with prior experience was higher, both in absolute numbers and relative terms. This finding may indicate potential gender-based differences in career trajectories and in the distribution of responsibilities related to IE.

A statistically significant association was found between gender and prior experience teaching SWD, $\chi^2(1, n=638)=4.03$, $p=0.045$. Female teachers were more likely to have such experience (65.6%) compared to male teachers (57.1%). This suggests that gender may influence exposure to IE, possibly due to differences in teaching roles or school assignment policies.

Table 4 presents the results of an ANOVA examining age group differences in attitude scores. The analysis revealed a statistically significant effect of age on TATIE, indicating that middle-aged teachers (30–39 years) tended to demonstrate more positive attitudes compared to both younger and older groups. This suggests a potential age-related trend in educators' perceptions of inclusion.

Table 3. Cross-tabulation of gender and experience

Gender	With experience (n)	Without experience (n)	Total (n)
Female	299	157	456
Male	104	78	182
Total	403	235	638

Table 4. ANOVA for age group differences in attitude scores

Age group	N	Mean attitude score	SD
<30	38	3.78	0.57
30–39	310	3.91	0.54
≥40	290	3.76	0.58

ANOVA results: $F(2, 635)=3.84$, $p=0.022$

Figure 1 illustrates the differences in mean attitude scores toward IE across age groups. As shown, teachers aged 30–39 reported the most favorable attitudes, while slightly lower scores were observed among both younger (<30 years) and older (≥40 years) participants. These results align with the ANOVA findings, which revealed a statistically significant effect of age on attitudes toward inclusion, $F(2, 635)=3.84$, $p=0.022$.

To identify between which age groups statistically significant differences occurred, a Tukey post-hoc test was conducted. The results, as presented in Table 5, showed that teachers aged 30–39 years had significantly higher attitude scores compared to those aged 40 and above ($p<0.05$). No significant differences were found between the 30–39 and under-30 groups, nor between the under-30 and 40+ groups. Overall, these findings indicate a positive age-related trend, with middle-aged teachers demonstrating the most favorable attitudes toward inclusion.
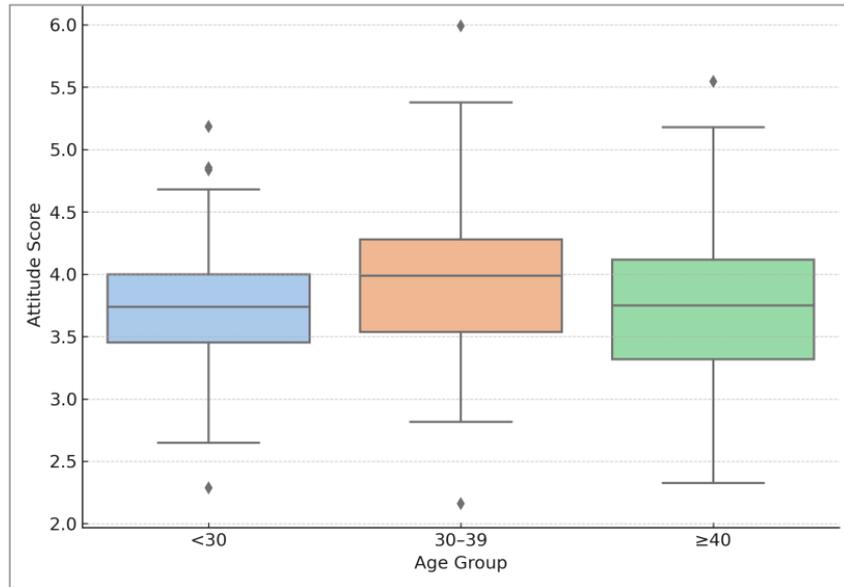
Figure 1. Distribution of attitude scores toward IE by age group

Table 5. Tukey post hoc test results for pairwise comparisons of attitude scores by age group

Comparison	Mean difference	Critical difference (HSD)	Significant
30–39 vs <30	0.13	0.225	No
30–39 vs ≥40	0.15	0.108	Yes (p<0.05)
<30 vs ≥40	0.02	0.225	No

The Pearson correlation analysis revealed a small but statistically significant negative relationship between years of TE and attitudes toward inclusion (r=-0.21, p=0.004). This suggests that teachers with more years of experience tend to hold slightly less favorable attitudes. One possible explanation is that experienced educators may rely on established routines that are less adaptable, whereas less experienced teachers—often more recently trained in inclusive practices—demonstrate greater openness to these approaches.

Table 6 presents the results of the multiple regression analysis. The model identified perceived school support, prior experience with SWD, professional training, and frequency of contact as significant predictors of positive attitudes toward IE. Gender and TE exerted weaker effects, while age was not a significant predictor. These findings underscore the critical role of institutional support and teacher preparation in fostering favorable attitudes toward inclusion.

Table 6. Multiple regression predicting TATIE

Predictor	β	t	p
Gender (0=male, 1=female)	0.07	2.04	0.042*
Age	-0.06	-1.51	0.131
Years of TE	-0.09	-1.99	0.046*
Prior experience with SWD	0.24	6.18	<0.001**
Frequency of contact with SWD	0.18	3.02	0.003**
Perceived school support	0.31	7.94	<0.001**
Training in IE	0.19	3.44	0.001**

Model summary: R^2=0.38, $F_{(7, 630)}$=54.22
Note: *p<0.005; **p<0.001

Figure 2 presents the standardized β-coefficients for the predictors included in the regression model, along with their 95% confidence intervals. The strongest predictors of positive attitudes toward IE were factors directly related to teachers' professional experience in an inclusive context: prior experience working with SWD, frequency of interaction with them, and perceived institutional support. In contrast, basic demographic characteristics such as age and length of service were not significant predictors. This suggests that the formation of attitudes toward inclusion depends less on the duration of professional experience and more on the nature of that experience. These findings highlight the importance of targeted training and the creation of opportunities for direct interaction with SWD.
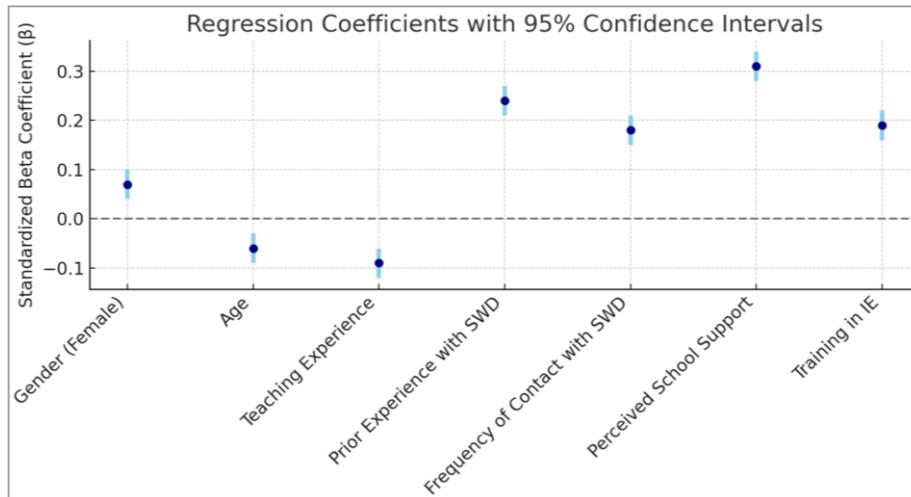
Figure 2. Regression coefficients with 95% confidence intervals

4.   DISCUSSION

This study explored the factors influencing public school TATIE in Kazakhstan. The findings provide important insights into the demographic, professional, and institutional variables that shape teachers' views on inclusion. The demographic profile revealed a strong gender imbalance, with female teachers predominating—a pattern consistent with global trends in the teaching profession, especially at the primary and secondary levels. The significant association between gender and prior experience with SWD suggests that female teachers may have greater opportunities, or be more frequently assigned, to inclusive classrooms. This supports previous research showing that gender can influence teachers' exposure to and engagement with inclusive practices [23]–[25]. Consequently, gender should be considered when designing professional development programs and assigning responsibilities related to inclusive teaching [26], [27].

The data also indicated that the teaching workforce is highly experienced, with more than 60% of participants having over 10 years of classroom practice. While professional maturity is often linked to greater classroom confidence, the present study revealed a modest negative correlation between years of TE and attitudes toward inclusion (r=-0.21) [28]. This suggests that veteran teachers may be more accustomed to traditional methods and less receptive to the flexible approaches required in inclusive classrooms. By contrast, less experienced teachers—who are more likely to have received training aligned with inclusive principles—appeared more open to such practices [29]. Although not directly examined, the relatively high proportion of participants with a master's degree or higher raises the possibility that advanced qualifications contribute to stronger acceptance of IE, a hypothesis for future research.

A notable finding is that only 43.7% of teachers had formal training in IE, and just 14.3% reported daily contact with SWD. These figures highlight significant gaps in professional preparation and practical exposure, both of which are essential for fostering inclusive mindsets [30]. The results align with previous studies demonstrating that direct experience with SWD is strongly associated with more favorable attitudes [31]. Expanding opportunities for hands-on practice—such as internships, co-teaching, or inclusive classroom placements—could therefore enhance teachers' confidence and acceptance of IE.

Institutional factors emerged as equally important. Only 24.8% of respondents perceived their schools as providing high or very high levels of support for inclusion. This suggests that limited structural resources and insufficient leadership commitment may hinder teachers from effectively implementing inclusive strategies, even when their personal attitudes are positive [32], [33]. Improving school-based resources and leadership backing is therefore crucial for successful implementation of IE. The findings show that although teachers in Kazakhstan generally have an open attitude toward inclusion, systemic barriers like insufficient training, limited experience with inclusive classrooms, and weak institutional support still present major challenges. Addressing these issues through focused teacher preparation and reforms at the school level is vital for turning positive attitudes into meaningful inclusive practices. While prior international studies consistently highlight teacher training and institutional support as the strongest predictors of positive attitudes toward IE [34]–[37], our findings add novel evidence from Kazakhstan, where gender and limited professional preparation emerged as particularly significant. This extends the global literature by illustrating how socio-cultural and institutional contexts uniquely shape teachers' perceptions of inclusion.

Based on the data collected, the following recommendations can be made to improve teacher training and support for IE in Kazakhstan:
-   Strengthen professional development: training programs for teachers should be expanded and designed with a strong emphasis on practical skills for working with SWD. Such training should be continuous and adapted to the specific conditions of schools.
-   Develop school-based support systems: educational leaders should cultivate a positive organizational climate, ensure access to adequate resources and instructional materials, and establish internal mechanisms for consultation and experience sharing among teachers.
-   Promote direct interaction with SWD: positive experiences with SWD foster more favorable attitudes toward inclusive practices. Initiatives that increase opportunities for such interactions should therefore be actively supported.
-   Consider socio-demographic characteristics: professional development initiatives should take into account factors such as age, TE, and gender, tailoring training and support to meet the diverse needs of teachers more effectively.

5.   CONCLUSION

This study identified key factors shaping TATIE in Kazakhstan, including gender, TE, prior experience with SWD, frequency of contact, professional training, and school support. By providing the first large-scale quantitative analysis of these attitudes in the Kazakhstani context using modern statistical methods, the study expands the existing literature and addresses a significant research gap. The findings highlight the critical role of direct experience with SWD and strong institutional support in fostering positive attitudes toward inclusion. These insights can inform the design of targeted professional development programs and school-level strategies to strengthen the effective implementation of inclusive practices in Kazakhstan's education system. Future research could build on these findings by employing longitudinal designs to examine how TATIE evolve over time. Comparative studies across different regions or countries may also provide valuable insights into the cultural and systemic factors shaping these attitudes. Furthermore, incorporating qualitative approaches, such as interviews or classroom observations, could enrich the understanding of teachers' experiences and reveal contextual nuances that are not fully captured by survey data. Finally, future studies might expand the scope beyond teachers to include perspectives of school administrators, parents, and students, thereby offering a more comprehensive view of IE practices.

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C	: **C**onceptualization	I	: **I**nvestigation	Vi	: **Vi**sualization
M	: **M**ethodology	R	: **R**esources	Su	: **Su**pervision
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CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

DATA AVAILABILITY

The corresponding author, [AA], may provide study data upon reasonable request.

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