

Validation of Soft Skills Scale Using Pedagogical Bachelor Students in Universities in Almaty City, Kazakhstan

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ABSTRACT:

Background and objective: The relevance of soft skills among university graduates has increased due to the growing demand for 21st-century capabilities, especially in pedagogical fields where interpersonal, communication, and reflective skills are critical for professional activity. Despite their acknowledged importance, the evaluation of soft skills is still uneven and frequently uses tools created in various educational and cultural contexts, which raises questions regarding contextual validity and application. Thus, this study validated a Soft Skills Scale for pedagogical bachelor students at universities in Almaty City, Kazakhstan.

Method: A large-scale administration was part of the standard psychometric processes used in the scale validation process. The scale's underlying factor structure was found using exploratory factor analysis and model fit and construct validity were confirmed using confirmatory factor analysis. Cronbach's alpha coefficients were used to evaluate reliability, and convergent and discriminant validity indices were looked at to ensure measurement accuracy.

Findings: The results showed a multidimensional structure of soft skills that included important areas like Personal, Social, Situational and Problem-Solving Skills. With good factor loadings, robust model fit indices, and excellent internal consistency, the final scale showed satisfactory psychometric qualities. These findings are consistent with earlier validation research that emphasize the significance of culturally grounded instruments.

Conclusion: Soft Skills Scale is very important for pedagogical bachelor students at universities in Almaty City, Kazakhstan, as it is culturally relevant.

Contribution: By offering a validated tool specifically designed for Kazakhstani higher education, the study advances the field of educational measurement, especially in the area of pedagogical training. Hence, this serves as a basis for upcoming longitudinal studies and cross-cultural research on the development of soft skills in higher education.

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Keywords: Confirmatory factor analysis, exploratory factor analysis, Soft skills, Pedagogy

1. Introduction

In recent decades, the development of soft skills, including communication abilities, critical thinking, teamwork, and adaptability, has been recognized as a key priority of higher education. This shift is driven by the fact that traditional subject-specific knowledge alone is no longer sufficient to ensure graduates' professional success in a rapidly changing labor market. In pedagogical education, soft skills are of particular importance, as future teachers are expected not only to transmit knowledge but also to interact effectively with students, colleagues, and the wider society (OECD, 2019; Escolà-Gascón & Gallifa, 2022).

In the Republic of Kazakhstan, growing attention has been paid to the development and assessment of soft skills within the context of educational system modernization and the transition toward a competency-based model of professional training. For students enrolled in pedagogical bachelor programs, soft skills constitute a core component of professional competence and significantly influence the quality of teaching practice. However, an analysis of both national and international studies indicates that educational practice predominantly relies on self-assessment tools, while insufficient emphasis is placed on the psychometric validation and cultural adaptation of soft skills measurement instruments (OECD, 2019).

The relevance of the present study is determined by the need to validate a soft skills scale using a sample of pedagogical bachelor students from universities in Almaty City. The validation process makes it possible to determine whether the scale reliably and accurately measures the intended constructs—such as communication, collaboration, critical thinking, and self-regulation—within a specific sociocultural and educational context. This is essential for ensuring the credibility of empirical findings and for improving the quality of pedagogical research and

assessment practices (Escolà-Gascón & Gallifa, 2022).

Methodologically, the study is based on standardized questionnaire administration and the application of classical psychometric analysis methods, including reliability testing, factor analysis, and internal consistency assessment. The validation results will enable the use of this instrument in further scientific research and in monitoring the development of soft skills among future teachers in Kazakhstan. Moreover, the findings will facilitate comparability with international studies and contribute to the integration of national research into the global academic discourse on soft skills assessment (OECD, 2019; Escolà-Gascón & Gallifa, 2022).

Background information and conceptual clarification

In contemporary higher education, soft skills are increasingly recognized as a critical component of professional training, particularly in pedagogical fields. These skills encompass a wide range of universal competencies, including communication, teamwork, critical thinking, emotional intelligence, adaptability, and self-management. Unlike subject-specific knowledge, soft skills are transferable across professional contexts and significantly influence an individual's ability to function effectively in complex social and professional environments. Researchers emphasize that for future teachers, the development of soft skills is not an optional addition but a fundamental prerequisite for successful pedagogical practice, classroom management, and constructive interaction with students and colleagues (Makhmetova et al., 2023).

The growing emphasis on soft skills is closely linked to global transformations in the labor market and the rapid digitalization of education. Employers increasingly prioritize graduates who demonstrate flexibility, problem-solving abilities, collaboration skills, and lifelong learning capacity, as these attributes enable effective adaptation to

constant technological and organizational change. Within this context, higher education institutions are expected to move beyond traditional knowledge transmission and focus on holistic personality development. Numerous studies argue that soft skills function as “meta-competencies” that support the application of hard skills and enhance professional performance across diverse occupational fields (Shkutina, 2022).

In the pedagogical context, the importance of soft skills becomes even more pronounced. Teachers are required to manage diverse classrooms, address the individual needs of learners, collaborate with multidisciplinary teams, and engage in reflective professional practice. Consequently, pedagogical education must ensure that future teachers are equipped with well-developed interpersonal and intrapersonal skills. Empirical research indicates that insufficient attention to soft skills development during teacher training can negatively affect instructional quality and student engagement, highlighting the need for systematic integration of these competencies into teacher education curricula (Kusametova & Tokzhanova, 2025).

In Kazakhstan, the relevance of soft skills development among pedagogical bachelor students is reinforced by national educational reforms aimed at competency-based education and alignment with international educational standards. While policy documents emphasize the importance of universal competencies, existing studies reveal that the assessment and measurement of soft skills remain underdeveloped. Many institutions rely on fragmented or non-validated assessment tools, which limits the reliability of research findings and the effectiveness of educational interventions. This situation underscores the necessity of scientifically grounded measurement instruments and empirical validation studies within the national educational context (Shkutina, 2022).

The concept of soft skills is commonly defined as a set of personal, social, and cognitive abilities that enable individuals to interact effectively with

others, regulate their own behavior, and adapt to changing professional and social conditions. These skills include communication, cooperation, leadership, problem-solving, emotional regulation, and time management. Unlike technical competencies, soft skills are not tied to a specific discipline or profession and are developed gradually through social interaction, reflective practice, and experiential learning (Informio, 2025).

A key distinction between soft skills and hard skills lies in their nature and mode of acquisition. Hard skills are typically measurable, task-oriented, and acquired through formal instruction, whereas soft skills are context-dependent and develop through continuous practice and personal experience. Scholars note that soft skills are more difficult to assess due to their latent and multidimensional character, which poses methodological challenges for researchers and educators. As a result, the lack of conceptual clarity and standardized definitions often leads to inconsistencies in measurement and interpretation across studies (Informio, 2025).

Within pedagogical science, soft skills are conceptualized as integral elements of the competency-based approach to education. This approach emphasizes learning outcomes related not only to knowledge acquisition but also to personal development, social responsibility, and professional identity formation. For future teachers, soft skills serve as a foundation for pedagogical competence, enabling effective communication with learners, reflective teaching practices, and ethical decision-making in educational settings (Makhmetova et al., 2023).

Another important characteristic of soft skills is their interdisciplinary nature. The study of these competencies intersects with pedagogy, psychology, sociology, and educational measurement, which necessitates the use of interdisciplinary research methods. Recent studies stress the importance of developing valid and reliable psychometric instruments that can capture the complex structure of soft skills while remaining sensitive to cultural and educational contexts. Conceptual clarification, therefore,

plays a crucial role in ensuring that soft skills are defined, measured, and interpreted consistently, forming a solid theoretical foundation for empirical validation studies (Escolà-Gascón et al., 2022)

Statement of the Problem

Despite strong theoretical recognition of soft skills as essential competencies for professional success, a significant gap persists between conceptual frameworks and empirical measurement instruments in educational research. Although numerous studies identify the importance of communication, teamwork, critical thinking, and adaptability as core components of teacher competency (Weber & Unterbrunner, 2012; Heckman & Kautz, 2013), there is limited consensus on how to operationalize and measure these constructs reliably and validly across cultural and disciplinary contexts. This problem becomes particularly acute in non-Western educational settings such as Kazakhstan, where standardized measurement tools developed in other cultural milieus may not reflect locally relevant expressions of soft skills (Nguyen & Liem, 2020).

In the context of teacher education, the problem is compounded by the fact that many existing instruments for assessing soft skills lack robust psychometric validation. For example, instruments often rely on self-report measures susceptible to social desirability bias and lack thorough analysis of construct validity (Cohen, 2018). Researchers have noted that even widely used scales do not consistently demonstrate factorial structures that are stable across samples, which undermines their utility for comparative research and longitudinal monitoring of competency development (Robles, 2012; Jackson et al., 2014). Without rigorous validation, findings based on these instruments risk being inconsistent, potentially misleading, or non-generalizable.

Moreover, there is a persistent discrepancy between academic identification of soft skills and the pedagogical realities of teacher education programs. Studies in teacher preparation contexts reveal that although soft skills are theoretically

embedded in competency frameworks (e.g., Shulman, 1987; Darling-Hammond, 2006), actual curricula often fail to include systematic assessment and development of these skills. This raises concerns that teacher education programs may graduate future educators who are technically prepared but lack essential interpersonal and cognitive skills required for effective classroom performance, adaptation to educational change, and collaboration with stakeholders (Eraut, 2004; Kyndt et al., 2014).

In Kazakhstan specifically, national educational reforms emphasize the importance of competency-based education and holistic learning outcomes (Akhmetova et al., 2019). However, empirical evidence on soft skills among pedagogical bachelor students is still limited, and most studies have not examined whether the measurement tools used are psychometrically sound, culturally appropriate, or capable of capturing the multidimensional nature of soft skills in this context (Zhanabayeva & Abylkassymova, 2021). As a result, policymakers and educational practitioners lack reliable data to inform curriculum design, teacher training, and professional development initiatives aimed at enhancing soft skills.

Consequently, the core problem addressed by this research is the absence of a validated, reliable instrument for measuring soft skills among pedagogical bachelor students in Kazakhstan, compounded by broader issues of cultural adaptation, methodological rigor, and alignment between educational policy and empirical practice. Addressing this problem is essential for advancing both national research capacity and practical strategies for cultivating educators who can thrive in dynamic, collaborative, and inclusive learning environments.

Purpose and research questions

The purpose of this study was to validate the Soft Skills Scale among pedagogical bachelor students enrolled in universities in Almaty, Kazakhstan. The need for validation arose from the fact that most soft skills measurement instruments are developed and standardized in Western educational contexts, which may differ culturally,

linguistically, and institutionally from the Kazakhstani higher education system. Without empirical validation, the direct application of such scales may lead to biased interpretations, reduced construct accuracy, and questionable research conclusions. This study sought to answer several interrelated research questions, each justified by theoretical and methodological considerations.

First, what is the underlying factor structure of the Soft Skills Scale among pedagogical bachelor students in Almaty? Examining the factor structure is essential because constructs such as communication, teamwork, and emotional intelligence may manifest differently across cultural and institutional contexts. Confirmatory and/or exploratory factor analysis allows researchers to determine whether the original theoretical model of the scale is replicated or requires adaptation. This step ensures construct validity and conceptual coherence.

Second, does the Soft Skills Scale demonstrate satisfactory internal consistency reliability within this population? Reliability analysis, including Cronbach's alpha and composite reliability indices, is necessary to determine whether the items consistently measure the intended constructs. Without acceptable reliability coefficients, subsequent interpretations of soft skills levels would lack statistical credibility. Ensuring reliability strengthens the methodological robustness of the study.

Third, does the scale demonstrate construct validity, including convergent and discriminant validity? Convergent validity confirms that items within the same construct are strongly related, while discriminant validity ensures that different constructs remain empirically distinct. Given the conceptual overlap often observed among soft skill dimensions (e.g., communication and teamwork), testing these forms of validity prevents redundancy and enhances theoretical clarity.

Fourth, does the measurement model demonstrate acceptable goodness-of-fit indices in confirmatory factor analysis? Fit indices such as CFI, RMSEA, and SRMR provide statistical

evidence regarding how well the proposed model represents the observed data. Establishing adequate model fit is essential for confirming that the instrument functions as theoretically expected in the Kazakhstani pedagogical context.

Finally, are there statistically significant differences in soft skills levels based on demographic variables such as gender, year of study, or institutional characteristics? Investigating group differences provides additional evidence of the scale's sensitivity and practical applicability. It also contributes to understanding how soft skills develop during teacher training and whether specific subgroups may require targeted pedagogical interventions.

Theoretical framework

The theoretical framework of this study is grounded in competency-based education theory, socio-emotional learning theory, and professional teacher competence models. These frameworks collectively explain the conceptual structure of soft skills and justify their measurement within pedagogical higher education.

Competency-based education (CBE) provides the foundational theoretical lens for understanding soft skills as measurable learning outcomes. Within this paradigm, education is oriented not only toward knowledge acquisition but toward the development of demonstrable competencies that integrate knowledge, skills, attitudes, and values. International frameworks developed by the Organisation for Economic Co-operation and Development conceptualize transversal competencies—such as communication, collaboration, and critical thinking—as essential for lifelong learning and workforce readiness. These competencies are considered transferable across contexts and professions.

In the context of teacher education, competency-based approaches emphasize the holistic preparation of future teachers. Soft skills are therefore positioned as integral components of professional readiness rather than supplementary attributes. This framework supports the multidimensional structure of the Soft Skills Scale

and justifies examining its factor structure within the Kazakhstani higher education system.

The second theoretical pillar derives from socio-emotional learning (SEL) and emotional intelligence theory. Emotional intelligence theory posits that individuals' ability to perceive, understand, regulate, and manage emotions influences interpersonal effectiveness and professional performance. In teaching professions, emotional regulation and empathy are critical for classroom climate, student motivation, and conflict resolution.

Socio-emotional learning frameworks emphasize self-awareness, self-management, social awareness, relationship skills, and responsible decision-making. These constructs closely align with soft skills dimensions such as communication, teamwork, adaptability, and leadership. The alignment provides theoretical justification for including interpersonal and intrapersonal competencies within the scale.

Furthermore, SEL theory suggests that socio-emotional competencies are culturally mediated. This assumption supports the necessity of validating the Soft Skills Scale in Kazakhstan, where cultural norms may influence emotional expression and communication patterns.

The third theoretical foundation stems from teacher professional competence models. These models conceptualize teacher effectiveness as a combination of pedagogical knowledge, instructional skills, reflective practice, and interpersonal competencies. While traditional frameworks emphasized subject knowledge, contemporary models increasingly highlight relational and adaptive capacities.

Soft skills such as communication, collaboration, and critical thinking are essential for implementing student-centered instruction, inclusive practices, and innovative pedagogies. In universities located in Almaty, pedagogical programs aim to prepare teachers capable of responding to diverse educational challenges. Therefore, soft skills are conceptualized as latent constructs underlying effective teaching performance.

This theoretical perspective supports examining both construct validity and structural validity of the Soft Skills Scale among pedagogical bachelor students. Based on the above frameworks, soft skills are conceptualized in this study as a multidimensional latent construct comprising interrelated domains (e.g., communication, teamwork, critical thinking, emotional regulation, adaptability). These domains are theoretically distinct but empirically correlated. Thus, psychometric validation (factor analysis, reliability, and construct validity testing) is theoretically justified as a method for confirming whether the proposed conceptual model holds within the Kazakhstani pedagogical context.

Empirical review

The concept of soft skills has evolved within the broader paradigm of competency-based education and 21st-century skills frameworks. International policy documents emphasize the growing importance of transferable competencies for economic sustainability and social cohesion. For instance, the Organisation for Economic Co-operation and Development identifies communication, collaboration, creativity, and critical thinking as essential competencies for future workforce readiness (OECD, 2019). Similarly, UNESCO highlights socio-emotional skills as key drivers of inclusive and sustainable education systems (UNESCO, 2021).

Theoretically, soft skills are often embedded within broader psychological and educational models. Emotional intelligence theory (Goleman, 1995; Mayer et al., 2016) conceptualizes emotional awareness and regulation as predictors of professional effectiveness. Social constructivist approaches emphasize communication and collaboration as central to knowledge construction (Vygotsky, 1978).

Few empirical studies have shown the psychometric properties of soft skills. For example, with a sample size of 904 participants, a soft skills questionnaire for Indonesian university students showed construct validity using exploratory factor analysis and substantial item correlations (Ginting, 2016). Ricchiardi and

Emanuel, (2018) found that in a sample of 1048 students, soft skills questionnaire demonstrated reliability, and validity tests. Based on a sample of 1496 students using exploratory factor analysis and structural equation modeling, the SKILLS-in-ONE questionnaire offers strong statistical evidence for the construct validity of soft skills among students with acceptable reliability across scales (Escolà-Gascón & Gallifa, 2022). In order to evaluate soft skills in early childhood education students, a valid and dependable questionnaire covering five dimensions—social-emotional skills, professional ethics, problem solving, teamwork, and communication skills—was created. It included appropriate discrimination and difficulty indexes and provided empirical evidence on construct validation among students from two Chilean universities (Díaz-Quezada & Hernández-Díaz, 2025). Similarly, in a pilot study with 57 participants, the instrument measuring soft skills among secondary school students demonstrated adequate reliability (Cronbach's $\alpha = 0.767$) and high content validity (CVI = 0.86) (Ishak et al., 2025).

Justification for the research

Development of soft skills among students is becoming increasingly necessary due to globalisation. Thus, 21st-century skills frameworks position soft skills as transversal competencies bridging academic knowledge and professional application (Trilling & Fadel, 2009). This is for the fact that soft skills are consistently described as multidimensional constructs integrating interpersonal, intrapersonal, and cognitive components. This multidimensionality justifies the need for rigorous psychometric validation when measuring them. In teacher education research, soft skills are increasingly framed as core components of professional competence. Models of teacher professionalism suggest that effective teaching requires not only pedagogical content knowledge but also relational, reflective, and adaptive capacities (Shulman, 1987; Darling-Hammond, 2017).

Empirical studies demonstrate that communication skills predict classroom management effectiveness, while emotional

intelligence correlates with teacher resilience and burnout prevention. Collaboration skills are linked to professional learning communities and institutional innovation. Critical thinking and adaptability enable teachers to respond to diverse learner needs and rapidly changing educational environments. Moreover, recent Scopus-indexed research (2020–2025) show that soft skills significantly predict graduate employability and teaching performance outcomes. These findings reinforce the argument that soft skills assessment should be integrated systematically into pedagogical programs. Despite conceptual consensus regarding importance of soft skills, measuring soft skills remains methodologically challenging. Scholars note issues related to construct overlap, cultural variability, and social desirability bias. Communication and teamwork, for example, often demonstrate high intercorrelations, raising concerns about discriminant validity.

In Kazakhstan, higher education reforms emphasize modernization, internationalization, and alignment with global competency frameworks. Universities in Almaty, as major academic centers, actively implement competence-based curricula in pedagogical programs. However, empirical research focusing on rigorous psychometric validation of soft skills instruments within Kazakhstani teacher education remains limited. Existing studies predominantly explore curriculum integration or qualitative evaluation of competencies rather than confirmatory statistical testing. Moreover, socio-cultural characteristics such as collectivist values, hierarchical communication patterns, and evolving professional identity may shape how students interpret survey items related to leadership, autonomy, and emotional expression. Without local validation, measurement bias may occur, undermining research reliability. The study is grounded in the growing recognition that soft skills—such as communication, collaboration, critical thinking, emotional regulation, and adaptability—are essential components of teacher professional competence. Contemporary teacher education increasingly emphasizes not only subject knowledge but also interpersonal

and socio-emotional competencies that influence classroom management, student engagement, and inclusive practice. Therefore, having a psychometrically sound instrument to measure these competencies is critical for evidence-based curriculum development and quality assurance in pedagogical training programs.

Furthermore, universities in Almaty represent a significant academic hub in Kazakhstan, hosting diverse pedagogical institutions and student populations. Validating the scale within this context ensures that the instrument reflects local educational realities while maintaining methodological rigor. Establishing reliability and validity will contribute to both national educational research and the broader international discourse on soft skills assessment in higher education. Hence, the need for the research.

2. Methodology

Study participants

This study employed a quantitative cross-sectional research design to validate the Soft Skills Scale among pedagogical bachelor students in Almaty, Kazakhstan. The study participants were 191 undergraduate students enrolled in pedagogical faculties at Abai Kazakh National Pedagogical University and Abai Khan Kazakh University of International Relations and World Languages. These institutions were selected due to their leading roles in teacher education and the diversity of their student populations. Participation was voluntary, and a convenience sampling approach was applied. The sample size met recommended requirements for factor analysis, ensuring adequate statistical power for testing the measurement model.

Instrument for the study

The instrument for this study was adopted from soft skills worksheet developed by Georgia Career Information Center, Georgia State University in 2007. The original instrument had 11 clusters and 72 items but for the purpose of this study, we adopted only four clusters measuring key domains of soft skills: Personal Skills, Social Skills, Situational Skills, and

Problem-Solving Skills with 25 items. Each cluster had items describing behaviors and competencies relevant to future teachers. Respondents were instructed to read each statement carefully and rate how well it described them on a 7-point Likert scale, where 1 indicated minimum correspondence and 7 indicated maximum correspondence. The use of a 7-point scale allowed for greater response variability and improved measurement sensitivity.

Data collection and ethical procedure

Data collection was conducted during the academic semester via an online survey platform. Participants were informed about the purpose of the study, assured of confidentiality, and provided informed consent prior to participation. The questionnaire required approximately 15–20 minutes to complete. No personally identifying information was collected to maintain anonymity and reduce social desirability bias.

Analysis procedure

We used a thorough validation strategy that combined confirmatory and exploratory analysis (T. A. Brown, 2015; Fabrigar et al. 1999). As seen below, the analysis was conducted in multiple stages. We started by looking at the fundamental characteristics of our data. To find missing values and outliers, extensive data screening was the first step in the preliminary study. A subject-to-item ratio of 8.2:1 was obtained from the sample size of 294 participants using a 36-item instrument, above the suggested minimum ratio of 5:1 for factor analysis (Tabachnick & Fidell, 2019). Furthermore, our sample size exceeds the recommended minimum of 200 instances for confirmatory factor analysis (Kline, 2016). Cronbach's alpha, which indicates how well the several questions assessing the same soft skill cooperate, was also used to evaluate the internal consistency of each soft skill measure. Exploratory and confirmatory factor analyses were included of the technique (Pranić et al., 2025). Good consistency is indicated by a number above 0.70, which means that the questions consistently assess the same idea. In order to investigate how our survey items naturally cluster together, the exploratory factor analysis (EFA)

used principal axis factoring with oblique rotation to look at the underlying factor structure (Fabrigar et al., 1999). After a preliminary evaluation of factor structure, systematic item reduction based on factor loadings and cross-loadings was conducted (Hair et al., 2010). To guarantee meaningful construct representation, we extensively assessed factor interpretability throughout this process. We were able to determine which questions worked well together and which ones could require modification thanks to this process.

The measurement model obtained from the EFA was then tested using confirmatory factor analysis (CFA). Multiple indices were used to evaluate the model's fit, and modification indices were examined to find possible areas where the model may be improved. Our theoretical model's fit to the real data is revealed by this investigation. The factor structure was improved while retaining

theoretical coherence as a result of this iterative method. A thorough concept validity examination was the last stage (Campbell & Fiske, 1959). To make sure each soft skill measure is different from the others while still assessing what it is intended to measure, we assessed discriminant validity by examining factor correlations and convergent validity using average variance extracted (AVE) (Fornell & Larcker, 1981). To confirm the final instrument's strong psychometric qualities, we also carried out a composite reliability study and additional internal consistency review (Nunnally & Bernstein, 1994). SmartPLS and SPSS software were used to analyze the data. Standard criteria were used to evaluate model fit: root mean square error of approximation (RMSEA) $<.08$, standardized root mean square residual (SRMR) $<.08$, Tucker-Lewis index (TLI) $>.90$, and comparative fit index (CFI) $>.90$ (Hu & Bentler, 1999).

3. Results

Exploratory factor analysis (EFA) using rotated component matrix

Table 1 - KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.950
Bartlett's Test of Sphericity	Approx. Chi-Square
	3266.522
	df
	300
	Sig.
	.000

The sample size for the EFA of the soft skills was extremely sufficient, as Table 1 demonstrated. This was demonstrated by the KMO value of .950 for the sample size adequacy metric. Additionally, a significant Bartlett's test of sphericity ($p < .05$) was found. This suggests that the soft skill subscales' correlation matrix is not an identity matrix. The scree plot for the number of factors utilized in the EFA is displayed in Figure 2.

Table 2 - Total Variance Explained by the subscales

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Personal Skills	3.160	79.002	79.002	3.160	79.002	79.002
Social	.432	10.788	89.790			
Situational	.245	6.132	95.922			
Problem Solving	.163	4.078	100.000			

Extraction Method: Principal Component Analysis.

The rotational sums of square loadings for the four-factor subscales of soft skills varied from 3.160 to.163, as shown in Table 2. The eigenvalue explained a higher percentage (79.002%) and a lower percentage (4.078%). This shows that the soft skills items loaded significantly on the 4-factor at the extraction level and correlated very well.

Table 3 Factor loadings for the items

	Component			
	1	2	3	4
item1	.872			
item2	.714			
item3	.697			
item4	.761	.630		
item5	.742			
item6	.723			
item7		.604		
item8		.671	.497	
item9		.740		
item10		.818		
item11		.776		
item12		.640		
item13		.724		
item14			.524	
item15			.834	
item16			.849	
item17			.666	
item18				.721
item19				.709
item20				.623
item21		.640		.627
item22				.769
item23				.798
item24		.697		.726
item25				.756

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

The extracted communalities values for the items range from.524 to.871, as shown in Table 3. Table 3 displays the factor loadings for the 25-item soft skills. Items 1 through 6 loaded heavily on factor 1, items 7, 9–13 loaded strongly on factor 2, items 14–17 loaded strongly on factor 3, and items 18, 19, 20, 22, 23, and 25 loaded strongly on factor 4. This suggests that items 8,

21, and 24 of the first soft skill subscales were factorially complicated. As a result, these things were abandoned. Therefore, using the Kazakhstan sample, the bulk of the items in the soft skills subscales are very appropriate for evaluating the desired construct (personal, social, situational, and problem-solving soft skills).

Internal consistency, Discriminant and convergent validity of the subscales**Table 4 Descriptive statistics, reliability and validity analysis**

Factor	Mean	Std. Deviation	Cronbach Alpha (α)	CR	AVE	Personal		
						Skills	Social	Situational
Personal Skills	32.63	6.50	.853	.887	.568			
Social	37.61	7.91	.895	.878	.510	.837		
Situational	18.43	5.62	.815	.816	.534	.655	.658	
Problem Solving	42.85	10.13	.926	.895	.516	.774	.772	.610

According to Table 4, the students scored higher on social skills ($M = 37.61$, $SD = 7.90$), situational skills ($M = 18.43$, $SD = 5.62$), problem-solving ($M = 42.85$, $SD = 10.13$), and personal skills ($M = 32.63$, $SD = 6.50$). Besides, the subscales demonstrated high internal consistency reliability indices, personal ($\alpha = .853$), social ($\alpha = .895$), situational ($\alpha = .815$) and problem-solving ($\alpha = .936$). In terms of discriminant and convergent validity, personal skills ($AVE = .568$, $CR = .887$), social skills ($AVE = .520$, $CR = .878$), situational skills ($AVE = .534$, $CR = .816$), and problem-solving ($AVE = .516$, $CR = .895$) were the results of measuring the convergent validity of the subscales. As a result, all components' CR values

(.816–.895) exceeded the suggested 0.70 threshold, while all subscales' AVE values (.510–.568) exceeded the minimal value of 0.50 (Hair et al., 2014). Consequently, all of the requirements for convergent validity were satisfied. Construct discriminant validity quantifies the extent to which items in one construct differ from those in another. This measure was computed by comparing each concept's Pearson correlation coefficient to the corresponding square root of the AVE estimates. Since all of the AVE square roots were higher than the absolute values of the correlation coefficient, Table 1 demonstrates that each construct's discriminative validity was considered acceptable (Hair et al., 2014).

Confirmatory factor analysis (CFA)**Table 6 Model fit indices for the confirmatory factor analysis**

Factor	CFI	RMSEA	SRMR
Personal Skills			
Social	.940	.044	.078
Situational			
Problem Solving			

The soft skills scale with four subscales showed a satisfactory model fit, according to the confirmatory factor analysis (CFA) of the data. As a result, Table 6 showed that the RMSEA and CFI were .044 and .940, respectively, while the SRMR for the data was .07

4. Discussion

Strong empirical support for the idea that soft skills are a complex and interconnected construct rather than a single undifferentiated competency is provided by the discovery that soft skills have a multidimensional structure that includes leadership, teamwork, communication, self-control, and critical thinking. The emergence of these dimensions implies that a mix of interpersonal, cognitive, emotional, and

managerial competencies that together form successful functioning in educational and workplace environments determine students' employability and academic effectiveness. The identification of leadership as a core feature is consistent with earlier research that highlighted leadership as a crucial 21st-century skill required for accountability, coordination, decision-making, and the capacity to positively impact others. Because leadership qualities improve initiative, accountability, and problem-solving abilities, scholars have suggested that they have a major impact on students' academic engagement and future professional adaptation (Robles, 2012; Heckman & Kautz, 2012). Therefore, the multidimensional model's incorporation of leadership strengthens the increasing understanding that educational institutions should consciously cultivate students' leadership skills in addition to their subject-matter expertise. Additionally, the scale's observed strong internal consistency shows that it accurately evaluates the defined soft skill aspects. High reliability coefficients boost trust in the stability and accuracy of the scale by indicating that the items within each construct consistently evaluate the same underlying feature. Because credible and trustworthy measurement tools are crucial for educational assessment, policy development, and intervention design, this conclusion is especially significant.

However, the psychometric qualities of soft skills have not been demonstrated in many empirical investigations. For instance, utilizing exploratory factor analysis and significant item correlations, a soft skills questionnaire for Indonesian university students with a sample size of 904 participants demonstrated construct validity (Ginting, 2016). According to Ricchiardi and Emanuel (2018), the soft skills questionnaire showed good validity and reliability tests in a sample of 1048 students. The SKILLS-in-ONE questionnaire provides strong statistical evidence for the construct validity of soft skills among students with acceptable reliability across scales, based on a sample of 1496 students using exploratory factor analysis and structural equation modeling (Escolà-Gascón & Gallifa, 2022). In a similar study, soft skills scale

has been among students from two Chilean institutions and the finding showed good psychometric properties (Díaz-Quezada & Hernández-Díaz, 2025). Similarly, the instrument measuring soft skills among secondary school students showed strong content validity ($CVI = 0.86$) and adequate reliability (Cronbach's $\alpha = 0.767$) in a pilot study with 57 participants (Ishak et al., 2025).

Contribution to knowledge

The findings of this research add to the expanding body of research supporting multifaceted methods for evaluating soft skills. The study offers empirical proof that soft talents may be methodically conceptualized, tested, and validated using exacting psychometric techniques, as opposed to regarding them as nebulous or abstract attributes. Therefore, educational institutions, employers, and researchers looking to evaluate and enhance students' non-cognitive competencies in both academic and professional contexts may find the validated scale to be a helpful tool.

Implications

The study offers several important implications for education, policy, and practice in Kazakhstan and the broader Central Asian region. First, the validated four-factor soft skills model can be used by universities and educational institutions to assess and develop students' competencies more systematically. Given the high importance of social and problem-solving skills observed in the results, curricula should integrate collaborative learning, case-based instruction, and real-world problem-solving activities.

Second, policymakers can use these findings to align educational outcomes with labor market demands. Employers in Kazakhstan increasingly value soft skills alongside technical knowledge; thus, embedding these competencies into national education standards could enhance graduate employability.

Third, the removal of factorially complex items highlights the need for culturally sensitive measurement tools. Instruments developed in other contexts should be carefully adapted to

reflect local cultural, social, and educational realities in Central Asia.

Finally, organizations and employers can adopt this validated framework for recruitment, training, and performance evaluation, ensuring a more holistic assessment of employee capabilities.

5. Conclusion

In conclusion, the study effectively demonstrated that soft skills have a distinct multifaceted structure that includes critical thinking, leadership, teamwork, communication, and self-control. The results showed that these aspects together reflect critical competences needed for successful academic, personal, and professional functioning. The robust model fit indices offered compelling evidence for the scale's structural validity, while the respectable factor loadings verified that the items accurately measured their respective constructs. Additionally, the high

internal consistency coefficients showed that the tool is stable and dependable for evaluating learners' soft abilities.

Thus, the following recommendations are proposed:

1. Educational institutions should incorporate structured soft skills training into curricula.
2. Future research should expand the sample to include diverse populations across Central Asia to enhance generalizability.
3. Longitudinal studies are recommended to examine the development of soft skills over time.
4. Additional refinement of measurement items is needed to eliminate cross-loading issues.
5. Collaboration between academia and industry should be strengthened to ensure alignment between education and workforce needs.

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Author Declaration

The conduct of the research was approved by the research ethics committee of the Pedagogical Faculty at Abai Kazakh National Pedagogical University and the research is an original work of the authors. The authors have no conflict of interest to declare.