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Original article

Transcultural Validation of the Teacher Stress Inventory (TSI) in Mongolia: An Exploratory Study of Stress Among School Teachers

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A B S T R A C T

Teacher stress has increasingly emerged as a significant challenge affecting both the efficiency of educational systems and the psychological well-being of teachers worldwide. However, empirical studies on teacher stress in Mongolia remain scarce, particularly regarding the development of psychometrically sound measurement tools. This study aimed to transculturally validate the Teacher Stress Inventory (TSI) in the Mongolian educational context and identify the major sources of teacher stress among schoolteachers. This quantitative study involved Mongolian schoolteachers from various educational settings. Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were conducted to examine the factorial validity and reliability of the Mongolian version of the TSI. The findings provided empirical evidence supporting the reliability and construct validity of the instrument. A six-factor structure was identified, accounting for 68.14% of the total variance, with acceptable to excellent reliability across the scales. Both EFA and CFA confirmed the validity and adequacy of the Mongolian TSI structure, and the resulting six-factor model demonstrated acceptable fit indices. Compared with the original ten-factor structure, the Mongolian version revealed highly interrelated stress dimensions, particularly in relation to job-related stressors, time management, discipline and motivation, and physiological and behavioral reactions to stress. In addition, the study identified the major sources of teacher stress as work-related issues and professional expectation issues. The findings contribute to the limited literature on teacher stress in Mongolia and provide a valuable foundation for designing intervention strategies aimed at improving teachers' welfare and psychological well-being.

1. INTRODUCTION

Transformations in global education have been experienced through time due to the influence of globalization and technology (Hargreaves, 2000, p.72). Teachers' role in education has changed from dispensers of knowledge to facilitators of development of the learners. Such changes have positioned teachers as the center

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of the learning process, with teacher wellness being an essential factor for success. This scenario has led to the emergence of a situation where teachers suffer psychological stress.

The theoretical basis for this current research is based on the Transactional Model of Stress and Coping. According to Lazarus and Folkman (1984, p.21), this model suggests that stress is not a direct response to external demands but rather a result of a complex interplay between demands in the environment and the individual's perception of those demands. According to this model, people constantly process whether the demands being posed are beyond their personal, emotional, or professional capabilities. Stress is more likely to be manifested if the demands being posed are beyond the individual's perceived coping capabilities. In the teaching profession, this might be due to an overwhelming workload, administrative responsibilities, or student management. By using this framework, researchers can conceptualize teacher stress as a multi-dimensional construct.

However, as the global discourse on occupational health continues to grow, the empirical literature in this area still lacks a unified approach in geopolitical regions, particularly in the case of Mongolia. This research seeks to address a number of important gaps in the literature, for example, a significant geographic bias in which the majority of literature on occupational health in the context of teaching stems from Western, developed countries, thereby failing to address the unique professional environment in which Mongolian teachers operate within a post-socialist, nomadic-urban context. While Mongolia has made tremendous strides in educational reform, these changes have introduced new stresses. This high level of time pressure observed in this study is consistent with the findings of the Ministry of Education and Science, UNESCO and United Nations (2022 p.13) that overcrowded classrooms and the administrative burden of digital transformation are the key issues in the current educational transition in Mongolia.

Another significant gap in the literature on occupational health in Mongolian teachers concerns a psychometric validation issue, whereby a significant amount of research in the region does not use statistical analysis for ad hoc translations, which are then used as a basis for validation without a statistical analysis for transcultural equivalence. In the absence of a statistical analysis, which could be used as a yardstick, a benchmark for Mongolian teachers' stress levels in comparison with international standards cannot be made.

Recent developments in Mongolian educational research (Jadamba et al., 2021, p.129; Miyejav et al., 2022, p.7; Ulziisaikhan et al., 2025, p.68) have been widely explored; however, the specific area of teacher stress measurement remains unexplored. For instance, recent studies have successfully validated the

Mongolian version of the Teacher's Sense of Efficacy Scale (TSES), demonstrating that teacher self-efficacy is a multi-dimensional construct comprising instructional strategies, classroom management, and student engagement (Ulziisaikhan et al., 2025, p.79). While these findings emphasize the importance of psychological resources in teaching, there is still a critical need to examine the 'negative' psychological states—specifically occupational stress. Given that teacher self-efficacy and stress are closely interrelated, validating the Teacher Stress Inventory (TSI) in Mongolia is the next essential step to provide a comprehensive understanding of the Mongolian teaching workforce's well-being.

A significant gap in the literature on Mongolian teachers also concerns a lack of information on the human cost of systemic changes in the Mongolian education system, which are currently in a state of significant evolution in terms of curriculum and technology, thereby failing to address the important question of the human cost of these systemic changes on Mongolian teachers. This research, therefore, seeks to address these important gaps in the literature in a way that moves beyond mere translation, in order to scientifically establish a culturally sensitive framework for the Teacher Stress Inventory (TSI).

The empirical study published in the International Journal of Trend in Scientific Research and Development shows that teachers experience significant levels of profession-related fatigue and stress (Enkhtsetseg and Munkhzul, 2019, p.959). However, the lack of standardized tools with established psychometrics in the Mongolian region makes it difficult to assess the results obtained. Despite increased research on teacher stress worldwide, there has been a scarcity of research on teacher stress in Mongolia. Although there has been some research conducted on burnout and professional well-being, there has been a glaring lack of research-based measures to measure teacher stress in Mongolia. For instance, there has been a lack of validation for a widely used measure of teacher stress: Teacher Stress Inventory (TSI).

Importantly, the major contribution of this research is to validate the Teacher Stress Index, initially designed for Western countries, for the specific environment of Mongolia, where there is a combination of the nomadic cultural heritage of the country and the influence of rapid urbanization, as well as peculiarities of working of Mongolian teachers. The present research contributes to psychology as it gives an exact tool that helps measure the intensity of stress among teachers taking into account different aspects like time management, student behavior, and professional respect.

In addition, the importance of this research also lies in both its practical and theoretical value. First, it contributes to the increasing volume of research

literature dealing with teacher stress across the world. In the global academic community, the issue of teacher stress has been relatively under researched in the Mongolian context. Most research dealing with teacher stress has been carried out in Western education systems. The Western education system might not reflect the socio-cultural and institutional characteristics of post-socialist education systems in Mongolia.

Moreover, this research provides an adapted tool for assessing teacher stress among Mongolian teachers, which will assist future researchers studying teacher stress in the Mongolian educational context. Thirdly, this paper provides insight regarding the sources of teacher stress within Mongolian education. Previous literature conducted within Mongolian educational institutions revealed that some of the major challenges facing teachers include heavy workloads, changes in the curriculum, administration, and rapid educational reform (Choisuren et al, 2018, p.83). Lastly, the findings of this research have important ramifications in the formulation of appropriate policies and teacher support programs. Knowing the nature and origins of teachers' stress can provide valuable insights into the formulation of relevant policies that seek to improve teachers' work conditions, psychological state, and sustainability. In this regard, the present study provides a valuable contribution towards the formulation of appropriate policies in Mongolian education.

In this study, we aimed to examine the psychometric properties of the Mongolian version of the TCI. In this respect, factorial, reliability, and validity issues concerning the use of the Teacher Stress Inventory by the Mongolian teachers will be evaluated. Also, the current research is intended to evaluate the psychometric characteristics of the instrument (i.e., reliability and factor structure) for the case of Mongolian teachers from various backgrounds. Lastly, the current research is intended to examine the current level and sources of occupational stress experienced by the Mongolian teaching staff.

Literature review: While the general theories of psychological stress provide a broad foundation, the specific measurement of stress within the teaching profession requires specialized instruments that capture the multidimensional nature of the classroom environment.

Previous cross-cultural validation studies in various countries, such as China, Germany, and Greece, have demonstrated that while the TSI is a robust and versatile tool, its factor structure often shifts depending on the specific socio-cultural and institutional characteristics of the educational system. For instance, studies in Asian contexts have frequently highlighted that "Professional Investment" and "Time Management" carry different psychological weights

compared to Western samples, likely due to differing societal expectations of the teacher's role. Furthermore, empirical evidence from diverse international settings consistently supports the TSI's high internal consistency and reliability yet emphasizes the necessity of transcultural adaptation to ensure that the instrument remains sensitive to local nuances.

As suggested by Kyriacou (2001, p.27), the concept of stress amongst teachers can be understood as an evaluation where teachers feel that the demands of the job are greater than what they have the ability to cope with. The difference between the demands of the environment and the abilities of the person is regarded as one of the major causes of stress, leading to de-professionalization and de-efficiency.

Teachers with high self-efficacy tend to have more positive evaluations of difficult situations; therefore, they perceive less threat in situations, reducing the likelihood of developing occupational stress. In a similar vein, the JD-R model argues that stress arises when there is a mismatch between high job demands—excessive workload, documentation requirements, student behavioral problems—and inadequate job resources—organizational support, professional autonomy, opportunities for development (Demerouti et al., 2001, p.501; Bakker and Demerouti, 2007, p312). This theoretical framework is particularly pertinent in the context of Mongolia's systemic changes that have increased the demands placed on the teaching workforce with curriculum changes.

Finally, empirical research has also pointed to the complex nature of the manifestations of teachers' stress, including emotional exhaustion, cognitive inefficacy, and behavioral withdrawal. These complex dimensions of teachers' stress are typically measured by the use of reliable research tools, such as the Teacher Stress Inventory (TSI), which systematically categorizes teachers' stress experiences into different, quantified sources and manifestations.

Concept and Dimensions of the Teacher Stress Inventory (TSI): The Teacher Stress Inventory (TSI) is an extensively employed, multi-dimensional scale that measures occupational stress among teachers. In contrast with general scales that measure overall stress, TSI takes into account differences between stressors and reactions to them, defining teacher stress in terms of their frequency and intensity (Fimian, 1984, p.279-280). The scale was created by Michael Fimian in 1988 (Fimian, 1988, p.41).

The Dichotomy of Sources and Manifestations: The architectural strength of the TSI lies in its bifurcated structure, which separates the construct into distinct factors grouped under two primary categories: sources and manifestations of stress. These include time management, work-related stressors, professional investment,

and discipline-related challenges (Fimian, 1988, p.16). In the Mongolian context, these stressors may be intensified by large class sizes and administrative workload. These dimensions provide a conceptual basis for identifying underlying factors of teacher stress in different cultural contexts.

Occupational strain impacts may be viewed from the perspective of stress manifestations that give objective proof of the multiple costs associated with stress to teachers (Fimian, 1988, p.7). The manifestation of stress includes emotional, fatigue, and cardiovascular manifestations. While the first one involves the experience of depression, anxiety, and hopelessness – the essence of teacher burnout, the fatigue manifestation relates to the physical cost of occupational strain, including lack of sleep and lethargy. Cardiovascular manifestation of stress, on the other hand, plays an important role in determining whether one is experiencing stress as their blood pressure and heartbeat increase accordingly. Similarly, behavioral symptoms include a broad range of methods to deal with stress, such as absenteeism and the resorting to drug abuse in order to cope with mounting professional stresses.

Psychometric Integrity and Cross-Cultural Utility: TSI's enduring relevance in educational research is attributed to its high internal consistency and construct validity. Fimian's original development involved large-scale factor analyses that confirmed the independence of its dimensions, with alpha coefficients typically ranging from 0.75 to 0.90 across subscales (Fimian, 1988, p.35). This robustness has made the TSI a preferred tool for transcultural validation studies. As noted in recent international guidelines, psychological instruments should be adapted for culturally and linguistically diverse populations (International Test Commission, 2018, p.2), while empirical studies demonstrate that the Teacher Stress Inventory has been successfully applied across different educational contexts.

Impact on Professional Well-being and Institutional Efficacy: However, the dimensions which are assessed through the use of TSI are not confined to the psychological realm but rather these dimensions predict the well-being of an organization. An excessively high level of "Professional Investment" and "Emotional Manifestation" dimensions has always been found to lead to undesirable professional results. Research has shown that when such stress dimensions remain unresolved, it leads to deterioration in the quality of teaching, the absence of any emotional warmth between teachers and students, and finally, a remarkably high rate of turnover among teachers (Kyriacou, 2001, p.29).

Global and Regional Perspectives on Teacher Stress: Research conducted across diverse international contexts consistently demonstrates that teaching is among the most emotionally demanding and high-strain professions in the modern

workforce (Johnson et al., 2005, p.178; Kyriacou, 2001, p.28). Across OECD nations and developing economies alike, the shift toward standardized testing and performance-based accountability has intensified teachers' psychological workloads.

A notable global indicator of teacher attrition is perceived institutional resource deficiency, where high expectations of student outcomes are often coupled with a lack of professional and administrative support, leading to a high level of emotional exhaustion (Greenberg et al., 2016, p.7). This is especially true in regional settings where education is still in a state of transition.

The Necessity of Transcultural Validation: In the context of globalized educational research, transcultural validation of measurement instruments is essential to ensure construct equivalence across cultures. Although stress and burnout are recognized as universal phenomena, their behavioral and linguistic manifestations are embedded within distinct cultural frameworks. As noted by the International Test Commission (2018, p.11), "simply translating an instrument does not assure that it measures the same construct or with equal accuracy in another culture".

Most standardized instruments, including the Teacher Stress Inventory (TSI), were originally developed in WEIRD (Western, Educated, Industrialized, Rich, Democratic) contexts. Without transcultural validation, researchers risk committing "category fallacy" (Kleinman, 1987, p.447), presuming that constructs are experienced identically across cultures. For example, classroom stressors may be interpreted differently in Mongolia due to variations in discipline standards and professional norms.

By applying rigorous procedures such as forward–backward translation and exploratory factor analysis, transcultural validation ensures that instruments reflect the lived realities of Mongolian educators. This methodological rigor bridges global theory with local application, enabling culturally relevant insights for policymakers while allowing meaningful international comparisons of teacher stress.

2. MATERIALS AND METHOD

Research Questions

The study is guided by the following research questions: Does the Mongolian version of the TSI have construct validity and internal reliability similar to its original version?, What are the underlying factors of teacher stress experienced by primary and secondary school teachers in Mongolia?, and to what extent does the Teacher Stress Inventory capture culturally specific dimensions of teacher stress in Mongolia?

Data collection and participants

In this study, we selected a total of 1,761 teachers from primary, secondary, and high schools from Ulaanbaatar and following provinces: Arkhangai, Bulgan, Govi-Altai, Darkhan-Uul, Orkhon, Uvurkhangai, Umnugovi, Selenge, and Khentii. We used Google Forms to collect questionnaire data between January 15 and February 15, 2026. Responses were screened for completeness and response quality: questionnaires with substantial missing data or with uniform responses across all items were excluded. After data sorting, 1,480 valid responses (whom 85.8% were female and 14.2%) were male were retained for statistical analysis. Regarding teaching experience, 23.2% had up to 5 years of experience, while 25.7% had more than 25 years of experience. In terms of school level, 26.1% were primary school teachers, and 73.9% were secondary or high school teachers. With respect to school location, 29.3% of the participants were from schools in Ulaanbaatar, while the remaining participants taught in schools outside the capital, representing a total of 16 provinces. To ensure cross-validation of the factor structure, the total sample was randomly split into two independent subsamples using SPSS. The first subsample was subjected to exploratory factor analysis (EFA), and the second subsample was used for confirmatory factor analysis (CFA), as recommended in the literature (Lorenzo-Seva, 2021, p.2665). Descriptive characteristics of the two subsamples are summarized in Table 1.

Table 1. Sample characteristics

Characteristics		Sample (EFA)		Sample (CFA)		Total	
		f	%	*f*	%	*f*	%
Gender	Male	106	13.8	104	14.7	210	14.2
	Female	665	86.3	605	85.3	1270	85.8
Teaching experience	5 years and below	188	24.3	155	21.9	343	23.2
	6-10 years	165	21.4	164	23.1	329	22.2
	11-15 years	112	14.5	110	15.5	222	15.0
	16-20 years	106	13.7	99	14.0	205	13.9
	21 years and above	200	25.9	181	25.5	381	25.7
Subject disciplines	Primary classroom	202	26.2	184	26.0	386	26.1
	Secondary and high classroom	569	73.8	525	74.0	1094	73.9
School location	Soum/bag	301	39.0	241	34.0	542	36.6
	Province center	259	33.6	246	34.7	505	34.1
	Ulaanbaatar (capital city)	211	27.4	222	31.3	433	29.3
Total		771	100	709	100	1,480	210

Teacher Stress Inventory

Teacher stress was measured using the TSI developed by Fimian (1988, p.8). The instrument conceptualizes teacher stress across two interrelated dimensions: sources of stress and manifestations of stress. It consists of 49 items designed to capture both the origins of stress and their observable effects. Response modalities are measured on a 5-point Likert scale, with five statements ranging from 1 ‘Strongly Disagree’ to 5 ‘Strongly Agree.’

Table 2. Structure of the Teacher Stress Inventory (TSI)

Sub-domains under sources of stress	Number of items	Sub-domains under manifestations of stress	Number of items
Time management	8	Emotional manifestations	5
Work related stressors	6	Fatigue manifestations	5
Professional distress	5	Cardiovascular manifestations	3
Discipline and motivation	6	Gastronomic manifestations	3
Professional investment	4	Behavioural manifestations	4
Total	**29**	**Total**	**20**

Translation

To translate the materials from English to Mongolian, we followed the guidelines of the International Test Commission (ITC, 2018) and the translation procedures described by Hambleton (1994, p.43-47). The adaptation process employed a forward–backward translation method. First, one author translated the instrument from English to Mongolian, and subsequently, a second author back–translated the Mongolian version into English. The all authors then collaboratively compared the original English version with the back–translated version, discussing any discrepancies in detail to finalize the Mongolian version. Finally, the finalized questionnaire was reviewed by a Mongolian language expert to ensure clarity and accuracy.

Statistical analysis

Data analyses were performed using SPSS (version 24.0) and AMOS (version 26.0). A p-value of less than 0.05 was considered indicative of statistical significance. Prior to conducting the analyses, the normality of the data was assessed by examining skewness and kurtosis values. Following the criteria suggested by Fabrigar et al. (1999, p.283), skewness values within the range of ±2 and kurtosis values within ±7 are considered acceptable for a normal distribution. In the present study, skewness values ranged from -1.378 to - 0.440, and kurtosis values ranged from -1.119 to 1.806, indicating that the data were approximately normally distributed.

Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted to evaluate the construct validity of the TSI. The suitability of the data for EFA was assessed using the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity. KMO values greater than 0.90 were considered excellent, values above 0.80 good, and values above .70 acceptable. Bartlett's test was required to be statistically significant ($P < 0.05$) to support factorability. In the EFA, factors with eigenvalues greater than 1 were retained (Kaiser, 1960, p.141). Items with factor loadings below 0.40 (Dalawi and Aimran, 2025, p.4) or with cross-loadings differing by less than 0.02 between factors were eliminated. Prior to conducting EFA, researchers should establish a threshold for factor loadings to be considered meaningful (Worthington and Whittaker, 2006, 821). It is common practice to arbitrarily consider factor loadings of 0.30 or 0.40 as minimally acceptable (Hair et al., 2019, p.153). Therefore, in this study, a loading of .4, was specified as a threshold for salient loadings. In addition, based on the recommendation of Yong and Pearce (2013, p.86) that (a)

a factor should contain at least three items, and (b) a two-item factor with high reliability should only be retained if it is uncorrelated with other factors.

CFA was conducted to evaluate model fit using multiple fit indices, including the Chi-square to degrees of freedom ratio (χ^2/df), the Root Mean Square Error of Approximation (RMSEA), the Normed Fit Index (NFI), Tucker–Lewis Index (TLI) and the Comparative Fit Index (CFI) (Goretzko et al., 2024, p.133). Criterion validity was examined by assessing the correlation between TSI scores. A correlation coefficient greater than 0.50 was considered indicative of satisfactory criterion validity. In previous research, NFI, TLI, and CFI values ranging from .80 to 0.90 have been interpreted as indicative of acceptable model fit, whereas values above 0.90 and RMSEA values below 0.08 are considered indicative of good model fit (Jiang et al., 2025, p.6; Goretzko et al., 2024, p.132). Internal consistency was estimated using Cronbach's alpha. An alpha value greater than 0.70 was considered acceptable, whereas a value above 0.90 was regarded as excellent (Cortina, 1993, p.103).

3. RESULT

Exploratory factor analysis

We excluded item (question) 40 from further analysis due to a low initial communality (below 0.30), suggesting that the item did not share sufficient common variance with the underlying factor structure. The items 14, 18, 29, 37, 38 and 39 had factors loading below cut-off value of 0.4. Additionally, the item 12 was also removed since they are cross-loadings which is < 0.20. Although items 11 and 27 were loaded on two factors, they were retained since the difference between the cross-loading exceeded 0.20, indicating adequate discriminator loading. The final EFA was conducted on 43 items, yielding a Kaiser–Meyer–Olkin (KMO) measure of 0.946 (e.g., values > 0.8 considered excellent Hair et al., 2006, p.114) and a statistically significant Bartlett's Test of Sphericity (χ^2 = 28,961.38, df = 903, P < 0.001), indicating that the data were suitable for factor analysis. Both Varimax (orthogonal) and Oblimin (oblique) rotations were performed, with the results of the oblique rotation adopted for this study. The 41 items retained in the final factors accounted for 68.14% of the total variance, with factor loadings ranging from 0.427 to 0.870. The resulting six-factor structure was aligned with theoretical expectations, and detailed information is presented in Table 3.

The exploratory factor analysis revealed a six-factor structure, indicating that the underlying dimensions of teacher stress in the Mongolian context involve overlap and consolidation of the original ten-factor model of the TSI. This finding aligns with previous research identifying teaching as an emotionally demanding profession characterized by workload, accountability pressures, and student-related stressors (Kyriacou, 2001, p.27-30; Jennings and Greenberg, 2009, p.499).

While these global stressors are evident in Mongolia, they appear reorganized within a distinct factor structure.

This restructuring further suggests that teacher stress in the Mongolian context reflects culturally specific patterns, where certain dimensions are merged or reinterpreted due to contextual factors such as high workload, administrative demands, and evolving educational expectations. These findings highlight the importance of culturally adapting measurement models to accurately capture teacher stress across different educational contexts.

This highlights how Mongolian teachers perceive stress dimensions as more interconnected than in the original framework. From the perspective of Social Cognitive Theory's conceptual framework, Bandura (1977, p.191; 1997, p.241) argues that the educator's belief in their professional competence, self-efficacy acts as a cognitive intermediary in the stress process. Factor 1 (12 items) corresponds to Time Management and Work-Related Stressors in the Original TSI.

Table 3. Factorial load matrix of exploratory factor analysis (n = 771)

Item	Communality		Factor					
	Initial	Extraction	1	2	3	4	5	6
5. Too much work to do / Маш их ажилтай байдаг	0.757	0.757	0.830					
7. Time pressures interfere with teaching / Цаг тулсан ажлууд хичээл сургалтад саад болдог	0.736	0.714	0.800					
6. Deadlines difficult to meet / Ажлаа хугацаанд нь амжуулах хүндрэлтэй байдаг	0.687	0.673	0.769					
8. Interruptions disturb work performance / Ажлаа хийж байх үед саад болдог олон зүйл байдаг	0.717	0.680	0.763					
9. Too much administrative paperwork Хийх шаардлагатай захиргааны бичиг цаасны ажил хэт их байдаг	0.665	0.648	0.760					
10. Having to meet deadlines / Товлосон хугацаатай олон ажлууд байдаг	0.645	0.625	0.746					
3. Lack of time for personal pursuits / Хувийн ажилдаа зарцуулах цаг хомс байдаг	0.647	0.615	0.734					
4. Lack of time for relaxation / Амрах зав байдагтүй.	0.667	0.618	0.730					
11. Workload not fairly distributed / Ажлын ачааллыг тэгш хуваарилдаггүй	0.613	0.578	0.690					
2. Not enough time to complete work / Ажлаа бүрэн хийх цаг хангалтгүй байдаг	0.553	0.478	0.643					
1. Feeling pressured to do too many things at once / Олон ажлыг зэрэг хийхэд дарамттай санагддаг	0.510	0.460	0.635					
13. Lack of resources or materials / Материаллаг нөөц, хэрэглэгдэхүүн дутагдалтай байдаг	0.421	0.363	0.528					
46. Stomach cramps / Стрессдэх үед ходоод базалж өвддөг.	0.901	0.805		.870				
45. Stomach pain of extended duration / Стрессдэх үед ходоод удаан хугацаанд өвддөг.	0.867	0.800		.869				
47. Stomach acid / Стрессдэх үед ходоодны хүчил ихэсдэг.	0.868	0.790		.862				
44. Rapid or shallow breathing / Би стресст орохоороо амьсгал давхцаж бачимддаг.	0.791	0.704		.752				
48. Би стрессдэх үедээ эмчийн жороор эм хэрэглэдэг.	0.610	0.559		.727				
43. Feelings of heart pounding or racing / Би стресст орохоороо зүрхний цохилт түргэсдэг.	0.789	0.648		.704				
49. Rushing in one's speech / Би стрессдэхээрээ хэл ам орооцолдож, түгдэрдэг.	0.606	0.560		.704				
42. Feelings of increased blood pressure / Би стресст орохоороо даралт ихэсдэг.	0.638	0.583		.695				
41. Procrastinating/ Би стресст орохоороо ажлаа зохицуулж чадахгүй хойш тавьдаг.	0.488	0.459		.556				

35. Calling in sick/ Би стресст орохоороо утсаар чөлөө авдаг.	0.906	0.800			.797			
36. Feeling unable to cope / Би стресст орохоороо юу ч хийж чадахгүй юм шиг санагддаг.	0.819	0.769			.773			
34. Feeling depressed / Би стресст орохоороо сэтгэл гутралд ордог.	0.806	0.788			.760			
32. Feeling overwhelmed / Би стресст орохоороо дарамтлуулж буй мэт санагддаг.	0.792	0.770			.759			
33. Feeling anxious or worried / Би стресст орохоороо сэтгэл түгшүүртэй байдаг	0.805	0.766			.754			
31. Feeling frustrated / Би стресст орохоороо уур бухимдлыг мэдэрдэг.	0.733	0.692			.683			
30. Using over-the-counter drugs / Би стресст орохоороо жоргүй эм хэрэглэдэг.	0.861	0.576			.537			
22. Lack of student effort / Сурагчдын сурах хичээл зүтгэл гаргадаггүй байдал нь намайг стресдүүлдэг.	0.828	0.775				.810		
23. Poor student behavior / Би сурагчдын зүй бус үйлдлүүдээс болж бухимддаг	0.739	0.752				.803		
21. Lack of student motivation/ Сурагчид сурах хүсэл эрмэлзэл дутмаг байдаг нь намайг стрессдүүлдэг.	0.817	0.756				.797		
25. Constant monitoring of student behavior / Сурагчдын зүй бус үйлдлийг байнга хянах шаардлагатай байдаг нь намайг стрессдүүлдэг.	0.743	0.725				.766		
24. Frustration over uncooperative students/ Би хичээлд идэвхгүй, хариу үйлдэл үзүүлэхгүй сурагчдаас болж бухимддаг.	0.688	0.689				.757		
20. Disciplining students takes too much time / Би суралцагчдыг дэг журамтай байлгахад их цаг зарцуулдаг.	0.503	0.497				.551		
17. Need more status and respect / Одоогийнхоос илүү байр суурь, хүндэтгэл хэрэгтэй гэж санагддаг.	0.380	0.492					.646	
16. Not progressing rapidly in job / Миний хувьд мэргэжлээрээ ахиц дэвших нь удаан	0.335	0.327					.496	
15. Lack of promotion or advancement opportunities / Албан тушаал дэвших боломж хомс байдаг	0.398	0.407					.491	
19. Lack recognition / Хийж буй ажлыг маань дэмждэггүй	0.405	0.421					.490	
27. Lack control over decisions / Би шийдвэр гаргалтад нөлөөлж чаддагүй.	0.635	0.754	0.441					.670
26. Personal opinions not sufficiently aired / Би өөрийн үзэл бодлоо хангалттай илэрхийлж чаддагүй.	0.515	0.552						.620
28. Not emotionally/intellectually stimulated/ Би сэтгэл зүй/оюуны хувьд төдийлөн идэвхтэй байж чаддаггүй.	0.503	0.513						.533

This suggests that physical and behavioral stress responses overlap significantly, forming a unified "physiological-behavioral" dimension of strain. Factor 3 (7 items) merges Emotional Manifestations and Fatigue Manifestations. Emotional exhaustion and physical fatigue appear as a single, intertwined outcome of occupational stress among Mongolian teachers. Factor 4 (6 items) aligns directly with Discipline and Motivation.

Classroom management and student motivation remain a distinct and prominent source of stress. Factor 5 (4 items) corresponds to Professional Distress. This captures stress related to lack of recognition, undervaluation of the profession, and institutional challenges. Factor 6 (3 items) matches Professional Investment (Table 4). Reflects concerns about limited career progression and opportunities for professional growth.

Table 4. Factorial load matrix of exploratory factor analysis (n = 771)

EFA result	**Original TSI**
Factor 1 (12 questions)	• Time Management • Work-Related Stressors
Factor 2 (9 questions)	• Cardiovascular Manifestations • Gastronomic Manifestations • Behavioral Manifestations
Factor 3 (7 questions)	• Emotional Manifestations • Fatigue Manifestations
Factor 4 (6 questions)	• Discipline and Motivation
Factor 5 (4 questions)	• Professional Distress
Factor 6 (3 questions)	• Professional Investment

Cronbach's alpha coefficients showed that each factor had acceptable to excellent reliability: Factor 1 (α= .0943), Factor 2 (α = 0.939), Factor 3 (α = 0.944), Factor 4 (α = 0.925), Factor 5 (α = .0718), and Factor 6 (α = 0.820).

Confirmatory factor analysis

For the sample used in the EFA, a six-factor model was tested using CFA, yielding $\chi^2 = 4432$, df = 764, $P < 0.001$. The RMSEA was 0.079, and both TLI and CFI exceeded .80, indicating a marginally acceptable model fit. For the CFA sample, a six-factor model yielded $\chi^2 = 4101$, df = 764, $P < 0.0001$, RMSEA = 0.079, with both CFI and TLI exceeded 0.80, indicating an acceptable model fit (Table 5). In contrast, the models with one- and two-factor structures did not yield acceptable fit indices. Three pairs of items showed potentially correlated error terms according to the modification indices. Although correlating these error terms would have slightly improved the model fit indices (TLI = 0.906, CFI = 0.913, RMSEA = 0.063), previous research suggests that post-hoc model modifications are not always

theoretically or statistically justifiable (Hermida, 2015, p.7). Therefore, the original factor structure was retained without correlating any error terms. The modification indices indicated three pairs of items with potentially correlated errors: "Q42"-"Q43", "Q35"-"Q36", and "Q21"-"Q22".

Table 5. Fit indices for TSI-Mongolia

	Models	**Fit index**					
		TLI	CFI	RMSEA (95 CI)	x^2	df	P
EFA (n = 771)	6 factor (41 items)	0.850	0.860	0.079 (0.077- 0.081)	4432.8	764	0.001
CFA (n = 709)	1 factor (41 items)	0.464	0.491	0.151 (0.149- 0.153)	13313.1	779	0.001
	2 factor (41 items)*	0.590	0.611	0.132 (0.130-0.134)	10352.0	778	0.001
	6 factor (41 items)	0.855	0.865	0.079 (0.076-0.081)	4101.4	764	0.001

* Sources of stress and manifestations of stress

4. DISCUSSION

The main purpose of the present study was to transculturally validate the Teacher Stress Inventory (TSI) within the educational system of Mongolia, to identify the main sources of teachers' stress. The results of EFA and CFA strongly supported the validity of the Mongolian version of the Teacher Stress Inventory. The EFA results revealed a six-factor model explaining 68.14% of the total variance. Although Fimian's (1988) original framework proposed a more detailed ten-factor structure, the Mongolian data demonstrated conceptual overlap among several stressors. Specially, Factor 1 reflected a combined construct of Time Management and Work-Related Stressors, suggesting that Mongolian teachers often perceive administrative responsibilities and heavy teaching loads as closely intertwined with difficulties in managing professional time demands. Fimian and Fastenau (1990, p.156) found in their study of U.S. teachers that factor analysis produced a ten-factor model, and explained that although stressors were theoretically distinct, in practice they appeared overlapping and consolidated in teachers' lived experiences. They explained that although stressors were theoretically distinct, in practice they appeared intertwined and consolidated, which was the primary reason for factor reduction. Wickramasinghe et.al (2022, p.536) validated the Sinhala version of the Teacher Stress Inventory in Sri Lanka and confirmed that stress sources and manifestations overlapped, with a two-factor model being the most appropriate. Similarly, Boshoff, et.al (2018, p.59) reported in the South African SABPA study that general circumstance-related stress and learner-related stress were not separate

but overlapping categories. In China, Wei et al. (2025, p.5) developed and validated the CT-SOS scale, and their findings also revealed that stressors across multiple ecological levels overlapped and consolidated, resulting in a six-factor model.

The results indicate strong internal consistency, with Cronbach's alpha values ranging from 0.718 to 0.944, supporting the reliability of the instrument across the identified factors. These findings are consistent with previous validation studies, which report similarly high levels of internal consistency.

Furthermore, the CFA results supported an acceptable model fit, confirming the structural validity of the Mongolian adaptation of the TSI. At the same time, that the results of the research are also important for understanding teachers' stress within the specific educational context of Mongolia. It is possible that teachers' workload, class sizes, and administrative demands due to ongoing educational reforms are sources of increased teachers' stress. Recent systematic reviews and meta-analyses highlight a convergence of stressors that transcend geographic boundaries, suggesting a "global epidemic" of educator burnout (Skaalvik and Skaalvik, 2016, p.1785).

The items/questions (14, 18, 29, 37, 38, 39, and 40) were excluded due to low factor loadings or significant cross-loadings, suggesting they did not distinctively contribute to the identified Mongolian factor structure. Specifically, items related to role ambiguity and individual autonomy—concepts frequently highlighted in Western frameworks—appeared less resonant within the highly centralized and reform-driven Mongolian educational context. For Mongolian educators, these items may have been perceived as conceptually redundant or less relevant to their immediate, high-pressure administrative and instructional realities, leading to their removal to ensure the instrument's structural integrity and cultural validity. In our study, 7 questions were excluded due to low factor loadings or significant cross-loadings, indicating that although stressors were theoretically distinct, they appeared overlapping and consolidated in teachers' lived experiences; this pattern was also observed internationally, as items were removed in the U.S. study with the original ten factors reduced to six (Fimian and Fastenau, 1990, p.143), in South Africa where items 1, 3, and 6 were eliminated resulting in two factors (Boshoff et al., 2018, p.132), in Sri Lanka where items 6 and 48 were removed confirming a two-factor model (Wickramasinghe et al., 2022, p.4), and in China where redundant items from the initial 40 were excluded leaving 31 items and a six-factor model (Wei et al., 2025, p.9).

The results of this study on professional distress among Mongolian educators align closely with the mid-term report by the Ministry of Education and Science, UNESCO, and UNICEF (2022), which found that the socio-economic status of

teachers, along with the heavy burden of curriculum reform and digital transformation, continue to be a major hindrance to the attainment of SDG4 goals in Mongolia (p.104), which may also contribute to the symptoms of stress found in the current sample. The education system experiences a "ripple effect," which means that the stress teachers face negatively impacts the quality of education and learning outcomes (Jennings and Greenberg, 2009, p.492).

These findings have important implications for educational policy and teacher support systems in Mongolia. In the Mongolian context, where the educational system is undergoing rapid modernization, the validated dimensions of teacher stress can inform targeted interventions, including wellness programs, time management support, and improvements in administrative systems.

The global approach offered here is the empirical base for the current study. The recognition of accountability, institutional pressures, and classroom challenges as global stimuli allows this study to assess the degree to which the educational transition in Mongolia increases these factors. The recognition of these global commonalities also legitimizes the transcultural validation of the TSI, as this approach ensures that the Mongolian version of the instrument measures factors that are universally acknowledged but locally relevant. Utilizing both the Mongolian versions of the Teacher Stress Inventory (TSI) and the Teacher's Sense of Efficacy Scale (TSES) in tandem creates a robust scientific framework for a more nuanced and multi-dimensional analysis of teachers' psychological states and professional activities.

The findings indicate that Work-Related Stressors and Discipline and Motivation remain the most prominent sources of stress among Mongolian teachers. High factor loadings associated with excessive paperwork and the management of disruptive student behavior aligning with global patterns identified in the literature (Kyriacou, 2001, p.29). However, the Mongolian educational context presents additional challenges. Ongoing educational reforms, including the transition from traditional teaching practices to digitally supported instructional systems, appear to increase teachers' administrative responsibilities and time-related pressures. These systemic transformations contribute to elevated levels of time-based stress among educators. Consistent with the Transactional Model of Stress (Lazarus and Folkman, 1984, p.19), based on the results of this study, Mongolian teachers regularly experience feelings of not having sufficient personal or organizational resources to cope with work demands. Nevertheless, it must be noted that there are some culturally specific findings. For example, while role ambiguity is one of the main causes of stress among Western teachers, this variable proved to be less significant for the Mongolian

sample, showing a greater focus on physiological and behavioral expressions of stress.

These systemic transformations contribute to elevated levels of time-based stress among educators. The transition from a 10-factor structure in Fimian's original TSI to a consolidated 6-factor model in the Mongolian version reflects specific cultural and systemic characteristics of the Mongolian educational landscape. A primary driver for this consolidation is the perceived overlap between administrative burdens and operational pressures. Mongolian educators often view heavy teaching loads, extensive paperwork, and time management challenges as a single, intertwined construct rather than distinct stressors. Furthermore, the findings suggest that stress in the Mongolian context is manifested more through somatic and behavioral symptoms rather than the role ambiguity often emphasized in Western studies. These culturally distinctive experiences of occupational strain led to a more integrated perception of professional demands, justifying the reduction and consolidation of factors to better reflect the local reality. This pattern may indicate a more somatic experience of occupational strain, reflecting cultural differences in how stress is experienced and expressed. These findings further highlight the importance of transcultural validation in psychological measurement.

Moreover, the significance of psychological buffers such as self-efficacy in preventing the onset of burnout symptoms is also emphasized in the study. The findings indicate that high levels of self-efficacy are significantly correlated with lower stress, suggesting that teachers who perceive themselves as more capable in classroom management and instruction experience reduced occupational strain. As reflected in the integration of Bandura's (1997, p.464) social cognitive theory in the development of the scale, there are possibilities for future research should further examine the role of self-confidence in teaching abilities as a buffer against the stressors identified in this study.

Although the current study provides a strong psychometric model, there are several limitations to the current investigation. Future research should employ the Mongolian TSI to conduct longitudinal studies to determine the fluctuation in teacher stress across various stages of their career. Furthermore, future research should utilize qualitative methodologies to determine the "lived experiences" of teachers in rural and urban Mongolia, providing further insight into geographical differences in support systems for professionals.

Conclusion: The current investigation makes an important contribution to the literature in educational psychology and occupational health by examining teacher stress within the unique socio-cultural context of Mongolia. As this study

investigation undertook a systematic transcultural validation of the Teacher Stress Inventory (TSI), it is evident that there has been a successful shift from the reliance on Western-centric models of psychology to an approach that is more meaningful and relevant to the local context, as reflected in the realities of the Mongolian educational system. The empirical findings from both the Exploratory and Confirmatory Factor Analysis provide several profound conclusions about the nature of occupational strain in this context. First, the emergence of a more refined six-factor structure implies that although the primary constituents of teacher stress tend to be more universal in nature, their internal structure may tend to be more nuanced. Moreover, the considerable overlap between administrative workload factors and time management factors implies that for Mongolian teachers, the primary source of stress may not be the sheer workload, but rather inefficiencies within the system that impede professional efficiency. This supports the broader theoretical premise that "stress is a product of the transaction between the person and an environment that is perceived as taxing or exceeding his or her resources" (Lazarus and Folkman, 1984, p.19). Second, the study emphasizes the "human cost" of rapid modernization and curriculum changes presently taking place in Mongolia. The high ratings in the "Work-Related Stressors" and "Discipline and Motivation" dimensions clearly indicate that the teaching staff are having trouble adjusting to the traditional methods of classroom discipline and the contemporary requirements in teaching methodologies. The manifestations of emotional and fatigue-related manifestations responses are not incidental; rather , they represent clear indications of systemic stress, which if not addressed, would inevitably lead to an increased turnover and a subsequent lowering in the quality of education in the country.

In summary, therefore, the validation of the TSI in Mongolia gives us a "scientific yardstick" which is necessary in the professionalization of teacher support systems. By recognizing and quantifying the various aspects of teacher stress, the Mongolian education community can start to build a more sustainable, resilient, and effective teaching profession, which will ensure that its commitment to educational reform is matched by its commitment to supporting educators.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

AUTHOR CONTRIBUTION

Ulziisaikhan Galindev: Conceptualization; Writing-original draft, Methodology, Data curation; Formal analysis. **Tumengerel Purev**: Conceptualization; Methodology, Writing-original draft. Writing review & editing. **Davaasuren Chuluunbaatar**: Methodology, Writing review & editing.

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