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Measuring Teacher Educators' Beliefs Regarding Professional Standards of Teacher Education in Pakistan: Development and Initial Validation of a Scale

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ABSTRACT

This study was conducted for developing and initially validating a reliable and valid scale for measuring professional standards in teacher education of Pakistan from the perspectives of teacher educators. Data were collected from 300 teacher educators from Punjab, Khyber Pakhtunkhaw and Federal Capital Islamabad. Exploratory factor analysis was used as a technique for initial validation to determine the dimensionality of the scale. Based on literature review a 60 items scale named Professional Standards of Teacher Education Scale (PSTES) was developed based on the national teacher education professional standards set by the government of education in collaboration with USAID for the enhancement of quality of teacher education in the country. The factor analysis identified a 10-factor scale representing the 10 dimensions of the professional standards of teacher education. The results strongly supported the hypothesized 10 factor scale model of the study. The scale may be used for measuring the beliefs about quality of teacher education professional standards in Pakistan and elsewhere. It is suggested that the scale may be tested in other context for further validation.

Introduction

Teacher education has a key role in the development and transformation of any society (Sok & Heng (2024). Quality of teacher education system defines the quality of the manpower produced by the teacher education system (Aajiz et al.,2019).Various scales are available on teacher

education system around the world, however, these scales did not fully cover all the important dimensions or standards of teacher education related to quality of teacher education system in Pakistan. This study aimed to explore perceptions and beliefs of teacher educators about the quality professional standards for teacher education. The findings of the study contribute towards understanding of the standards of quality practices in teacher education.

Literature Review

The global standards of quality practices in teacher education are changing drastically in view of the demands of the new era. Several new trends have emerged such as technology based instruction, sustainability issues and challenges, policies and plans and new directions in teaching and learning (Fischer, et al, 2022). Due to these and other trends, the status of teacher education is undergoing substantial changes all over the world including Pakistan. The idea of quality standards of teacher education emerged with the realization to enhance the professional role of teachers (Ahmad at al., 2020). Government of Pakistan introduced several changes in the education related to plans and policies of teacher education. One such development was the adoption of the essential professional standards for teacher education which represented and collated with the international standards of quality practices (Ajiz et al. 2019). These standards included subject matter knowledge, human growth and development, Islamic ethical and social values, instructional planning and strategy, assessment, learning environment, effective communication and use of communication technology, collaboration and partnership, continuous professional development, teaching of English as a foreign language (Ahmad & Mirza, 2020; Deeba et al.,2022).

Under this umbrella, efforts were made to introduce national professional standards with STEP program (Strengthening Teacher Education in Pakistan) under the financial help of USAID in 2005. The major aim of this progamme was enhancement of the government efforts for ensuring quality of teacher education in Pakistan and uplifting the policy structures for the ultimate improvement of teacher education standards in the country (Ali, 2011; Ghazi et al. 2013). The STEP program was initiated with the collaboration of various stakeholders to develop professional standards in Pakistan for teachers in order to improve the professional skills of teachers and enable them to deliver positively as professionals. In this regard, the major step was development of the national professional standards for teacher education for the amelioration of teaching and learning standards and accepting the role of teaching as a priority profession for national development. This program was supported by the ministry of education with the assistance of the UNESCO and USAID for the development of teacher education standards in Pakistan (Atta et al.2012; Butt, 2008). Based on this initiative, the professional standards were adopted to equip the teachers to be able to act as creative and active professionals having the required knowledge, skills and attitudes with diversified approaches of teaching and learning and creating learner centered environment in order to meet the standards of 21s century needs (Government of Pakistan, Ministry of Federal Education and Professional Training, 2018).

As part of the global initiatives for quality teacher education, the Pakistani government adopted these collaborative efforts with the hope to have positive impacts on student learning and its teacher education system across the country (Ahmad at al. 2014; Mehmood et al. 2021). The professional standards for quality enhancement in teacher education focused on the importance of transfer of updated knowledge of teaching and learning, assessment and creation of conducive teaching and learning environment as the major goal of these endeavors. The program was centered upon improving the professional skills of the pre-service teaching, master trainers and teacher educators in the field of teaching (Molina et al. 2020).The newly introduced standards

were geared upon the betterment of the professional role of teachers through policies, processes and systems introduced for the certification of the teacher education program (Ahmad et al. 2021; Khan & Haseeb, 2017).

Initially, the quality professional standards were set after consultation with all the stakeholders for the professional development of teachers at primary level, however, they were later on applied to secondary and teacher educators too for fostering the professional knowledge, skills and dispositions of teachers at all levels of education. The standards were aimed to improve the teaching competencies, skills and attributes pf teaching profession all over the country (Liaqat & Afzal, 2019). In order to disseminate the program objectives, workshops, seminars, symposiums and conferences were held all over the country to create awareness among the teachers, teacher educators about the curriculum, teaching and learning aids, documents, handbooks requiring for teaching and learning (Rozi & Khan 2021). To reform teacher education in Pakistan, the STEP initiative was adopted as a parameter for enhancing the quality of teacher education and to prepare teachers for their future roles as competent professionals. The teachers mandated to acquire the quality teaching practices for the preparation of students for their roles as responsible and active citizens rather than just transferring information (Rafiq & Qaiser, 2021).

The teaching professional standards were considered to be the key elements for the reformation of teaching system in the country. These standards were based on essential frameworks, training certification, licensing, qualification indicators and continuous upgradation of professional skills through workshops and professional training certification for teachers. Through the professional standards for quality improvement in teacher education, B.Ed (Hons) and ADE programme were started by the government for increasing accessibility in teacher education and making it more effective in terms of international standards and to do away with the age old previously held traditional practices in teacher education (Akram & Zepeda, 2015; Shaukat & Chaudhury, 2020). For this purpose, intensive training programme (s) were introduced to make teaching a recognized profession meeting the national and international needs of the current century. The efforts were also aimed to change the traditional stereotyped beliefs of teachers about teaching and learning through continuous professional training initiatives (Tariq et al.,2020).

Rationale for the study

Although, there are numerous measurement tools available in the existing literature for the purpose of assessment of teaching and learning outcomes from the perspective of teachers, students and management, however, in the context of Pakistan, these measures do not fully capture all the major areas of teaching standards (Ali et al.,2022). Secondly, in the available research, the perspectives of teacher educators have not been fully focused regarding the national professional standards (Mehmood et al.,2021). Hence, the existing scales did not comprehensively measure the teaching and learning outcomes of teachers and learners vis a vis the established standards. Most importantly, the existing national quality standards of teacher education were either not considered or touched upon insufficiently. This situation warned the need of such a measurement tool which could fully cover all the recognized national professional standards of teacher education so that a comprehensive tool may be constructed for the complete evaluation of all the 10 standards such as subject knowledge, human growth and development, Islamic ethical and social values, instructional planning and strategy, assessment, learning environment, effective communication and use of communication technology, collaboration and partnership, continuous professional development, teaching of English as a foreign language. To achieve this aim, this study attempted to develop a scale which covers these areas of national professional standards for quality in teacher

education based on the beliefs of teacher educators. The empirical findings of the study may provide firm theoretical foundation for the development of a reliable and valid scale which may be used for collecting data which can be used for further enhancing the quality standards of teacher education in Pakistan.

Research Objectives

The present study was designed to meet the following objectives.

1. To develop an instrument for measuring teacher educators' beliefs concerning professional standards of teacher education in Pakistan.

2. To explore dimensions of the scale using exploratory factor analysis

Scale Development

The process of scale development consists of the following major steps as mentioned below. The researcher used the five phases of scale development framework of Torchim (2006) for developing the scale. These include, (1) defining the constructs, (2) generating items, (3) expert judgement, (4) item retention and (5) scale administration.

Phase 1: Defining the Construct

At this stage, the researchers conducted a vast survey of available literature related to the topic. This included researcher papers, documents and other published material. Based on the survey 10 important themes were identified regarding the quality of teacher education in Pakistan. These themes were the 10 national professional standards for teacher education in Pakistan.

Phase 2: Generating Items

In this stage, the researchers produced items for each professional standards and coactively 60 items were finalized to be tested for further stages.

Phase 3: Expert Judgment

At this stage, the researchers consulted three subject experts (PhD in education) for reviewing the items as a requirement of content validation. The experts reviewed the items and based on their feedback, the scale was finalized for further stage.

Phase 4: Item Retention

At this stage the researchers tested the reliability of the scale and used the item total correlation criterion and communalities to retain or delete the items. The results showed that item correlation and communality values were above the acceptable range.

Phase 5: Scale Administration

In the last stage, the researchers distributed the newly constructed scale for data collection among the 300 teacher educators. The respondents were selected based on population sample or Census basis.

Exploratory Factor Analysis

The EFA technique was used to find out the sample adequacy for conducting factor analysis based on the collected data. Hence, the factor analysis was conducted to explore the dimensionality of the scale and to determine the factor structure. Varimax rotation was used as a rotation method with principal component analysis along with screeplot (Figure 1) as the extraction method.

Results

Table 1: *KMO and Bartlett's Test*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.942
Bartlett's Test of Sphericity	Approx. Chi-Square	13207.120
	df	1770
	Sig.	.000

Table 1 shows the values of KMO (.942) and Bartlett's' test of sphericity (.000) provided the sufficient evidence for data adequacy allowing the factor analysis.

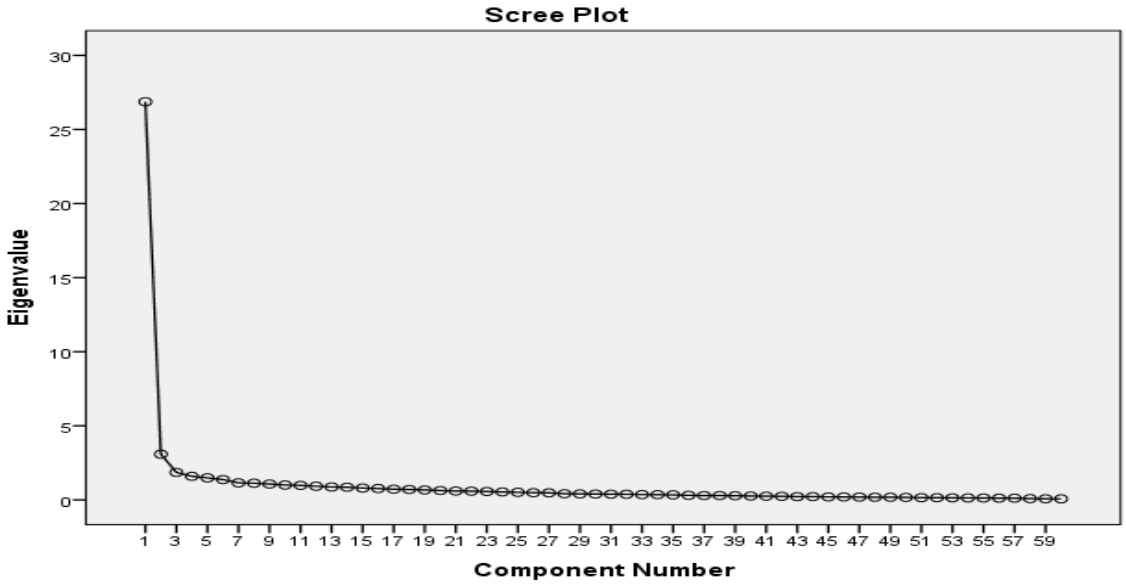

Figure 1: Screeplot

Table 2:

Communalities, Means and Standard Deviation (SD)

Item No.	N	Min	Max	Mean	Std. Deviation	Extraction
1	300	2.0	5.0	4.420	.8282	.660
2	300	2.0	5.0	4.317	.8074	.700
3	300	1.0	5.0	4.300	.8558	.564
4	300	2.0	5.0	4.377	.8389	.641

5	300	2.0	5.0	4.210	.8612	.657
6	300	2.0	5.0	4.377	.7768	.542
7	300	2.0	5.0	4.103	.8843	.624
8	300	2.0	5.0	4.223	.8179	.611
9	300	1.0	5.0	4.083	.9693	.651
10	300	2.0	5.0	4.167	.8726	.705
11	300	1.0	5.0	4.430	.7485	.647
12	300	1.0	5.0	4.190	.9000	.679
13	300	1.0	5.0	4.167	.8414	.710
14	300	1.0	5.0	4.223	.9678	.766
15	297	1.0	5.0	4.283	.8858	.605
16	299	1.0	5.0	4.368	.8622	.703
17	300	1.0	5.0	4.393	.8046	.690
18	300	1.0	5.0	4.240	.9515	.754
19	300	2.0	5.0	4.413	.7903	.788
20	300	1.0	5.0	4.327	.8616	.710
21	300	2.0	5.0	4.203	.8472	.732
22	300	2.0	5.0	4.250	.8184	.734
23	300	2.0	5.0	4.287	.7254	.573
24	300	2.0	5.0	4.320	.7390	.588
25	300	1.0	5.0	4.210	.8534	.603
26	298	2.0	5.0	4.315	.7963	.659
27	299	1.0	5.0	4.217	.8332	.637
28	299	2.0	5.0	4.334	.7912	.712
29	300	1.0	5.0	4.173	.8597	.706
30	300	2.0	5.0	4.260	.7710	.631
31	299	1.0	5.0	4.294	.7774	.710
32	298	1.0	5.0	4.285	.7801	.686
33	299	1.0	5.0	4.274	.8017	.722
34	299	2.0	5.0	4.237	.7818	.591
35	299	1.0	5.0	4.181	.7863	.706
36	300	1.0	5.0	4.160	.9186	.701
37	300	1.0	5.0	4.240	.8111	.732
38	299	2.0	5.0	4.194	.8528	.633
39	299	1.0	5.0	4.304	.9147	.710
40	299	1.0	5.0	4.284	.8127	.674
41	299	2.0	5.0	4.274	.9114	.728
42	300	2.0	5.0	4.317	.8156	.700
43	299	1.0	5.0	4.324	.8305	.675
44	300	2.0	5.0	4.250	.8699	.707
45	300	2.0	5.0	4.267	.8513	.688
46	300	2.0	5.0	4.283	.7822	.661
47	300	2.0	5.0	4.397	.8009	.701
48	300	2.0	5.0	4.320	.8040	.660
49	299	1.0	5.0	4.274	.8699	.690
50	300	1.0	5.0	4.293	.8698	.627
51	298	2.0	5.0	4.292	.8074	.624
52	299	1.0	5.0	4.234	.8701	.673
53	298	1.0	5.0	4.279	.8759	.607

54	300	1.0	5.0	4.290	.8534	.661
55	300	1.0	5.0	4.190	.9611	.710
56	300	2.0	5.0	4.211	.9372	.714
57	300	2.0	5.0	4.157	.9582	.828
58	300	1.0	5.0	4.141	1.0085	.726
59	300	1.0	5.0	4.158	.9702	.726
60	300	1.0	5.0	4.184	.9674	.656

Table 2 shows that the mean values of all variables are above .40 being above the midpoint .30. Besides, the values of communities are all above the acceptable level.

Table 3:

Total Variance of the PSTE Scale

Component	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	26.867	44.778	44.778	26.867	44.778	44.778
2	3.085	5.142	49.920	3.085	5.142	49.920
3	1.857	3.094	53.015	1.857	3.094	53.015
4	1.593	2.656	55.670	1.593	2.656	55.670
5	1.486	2.476	58.146	1.486	2.476	58.146
6	1.370	2.283	60.429	1.370	2.283	60.429
7	1.149	1.916	62.345	1.149	1.916	62.345
8	1.128	1.880	64.225	1.128	1.880	64.225
9	1.071	1.784	66.009	1.071	1.784	66.009
10	1.005	1.675	67.684	1.005	1.675	67.684
11	.982	1.637	69.322			
12	.923	1.539	70.861			
13	.870	1.450	72.311			
14	.856	1.427	73.738			
15	.801	1.335	75.073			
16	.768	1.280	76.353			
17	.722	1.203	77.556			
18	.703	1.171	78.727			
19	.672	1.120	79.847			
20	.634	1.056	80.903			
21	.600	.999	81.902			
22	.592	.986	82.888			
23	.570	.950	83.838			
24	.536	.893	84.731			
25	.511	.852	85.583			
26	.484	.806	86.389			
27	.477	.794	87.184			
28	.416	.694	87.878			
29	.407	.678	88.556			
30	.397	.662	89.218			
31	.386	.644	89.862			

32	.379	.632	90.493
33	.358	.597	91.090
34	.351	.585	91.675
35	.338	.563	92.238
36	.309	.515	92.753
37	.295	.491	93.244
38	.291	.485	93.729
39	.281	.468	94.197
40	.263	.439	94.636
41	.251	.419	95.055
42	.244	.407	95.461
43	.223	.372	95.833
44	.219	.365	96.198
45	.203	.339	96.537
46	.197	.329	96.866
47	.190	.317	97.183
48	.182	.303	97.486
49	.176	.293	97.779
50	.168	.281	98.060
51	.151	.251	98.311
52	.146	.243	98.554
53	.139	.232	98.785
54	.133	.222	99.007
55	.125	.208	99.216
56	.121	.201	99.416
57	.115	.191	99.608
58	.085	.142	99.749
59	.078	.130	99.880
60	.072	.120	100.000

Extraction Method: Principal Component Analysis.

Table 3 explains the total variance in the scale based on the PCA method. The total variance of the scale was 67.684. The first dimension (subject knowledge) explained 44.778 % of the variance in the scale. The second dimension (human growth and development) explained 49.920 % of the variance in the scale. The third dimension (Islamic ethical and social values), explained 53.015% of the variance in the scale. The fourth dimension explained (instructional planning and strategy) explained 55.670 % of the variance in the scale. The fifth dimension (assessment) explained 58.146 % of the variance in the scale. The sixth dimension (learning environment) explained 60.429 % of the variance in the scale. The seventh dimension (effective communication and use of communication technology) explained 62.345 % of the variance in the scale. The eight dimension (collaboration and partnership) explained 64.225 % of the variance in the scale. The ninth dimension (continuous professional development) explained 66.009 % of the variance in the scale. The tenth dimension (teaching of English as a foreign language) explained 67.684 % of the variance in the scale.

Table 4

Rotated Component Matrix of PSTE Scale

Variable	Component									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Subject knowledge	.599									
Subject knowledge	.652									
Subject knowledge	.597									
Subject knowledge	.541									
Subject knowledge	.646									
Subject knowledge	.571									
Human growth and deve.		.421								
Human growth and deve.		.605								
Human growth and deve.		.652								
Human growth and deve.		.422								
Human growth and deve.		.556								
Human growth and deve.		.704								
Islamic ethical values			.451							
Islamic ethical values			.337							
Islamic ethical values			.509							
Islamic ethical values			.672							
Islamic ethical values			.632							
Islamic ethical values			.554							
Instructional planning & strat.				.524						
Instructional planning & strat.				.636						
Instructional planning & strat.				.642						
Instructional planning & strat.				.672						
Instructional planning & strat.				.503						
Instructional planning & strat.				.643						
Assessment					.598					
Assessment					.723					
Assessment					.695					
Assessment					.666					
Assessment					.523					
Assessment					.640					
Learning environment						.501				
Learning environment						.640				
Learning environment						.471				
Learning environment						.509				
Learning environment						.619				
Learning environment						.746				
Effective communication							.723			

Effective communication	.614			
Effective communication	.526			
Effective communication	.713			
Effective communication	.412			
Effective communication	.677			
Collaboration & partnership		.587		
Collaboration & partnership		.562		
Collaboration & partnership		.515		
Collaboration & partnership		.485		
Collaboration & partnership		.590		
Collaboration & partnership		.607		
Professional development			.570	
Professional development			.508	
Professional development			.654	
Professional development			.695	
Professional development			.747	
Professional development			.670	
Teaching of English				.665
Teaching of English				.543
Teaching of English				.445
Teaching of English				.652
Teaching of English				.765
Teaching of English				.754

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 14 iterations.

Table 4 shows that majority of values of factor loading for each item in the PSTE are above .50 giving a strong evidence for strong correlation among all the variables.

Discussion

This study aimed to develop an instrument for measuring perspective of teacher educators towards national professional standards set for the quality of teacher education practices in Pakistan. Exploratory factor analysis method was used to identify the factor structure of the 10 factor hypothesized scale. The analysis of the collected data showed that all the values for loading 60

items were within the acceptable range. This study discovered that the first strongest standard was subject knowledge having the highest variance in the overall scale. These findings are in line with previous result findings where subject knowledge has highlight to be the most important factor in the teacher development (Shiddiq et al .,2022). Studies have highlighted that teachers must have updated knowledge about their subject. This will help them to deliver the right knowledge to students. The current study found that human growth and development was the second strongest standard to define quality of teacher education. This finding supports the results of previous studies that the major goal of quality education is promotion of human development and all its faculties in a harmonious way (Zahid & Saleem, 2020).

The study further revealed that their third important standard was Islamic ethical and social values. This finding coincides with previous research findings and even supports the main cardinal feature of all education policies of Pakistan where teachers are mandated to demonstrate high standards of Islamic ethical values inside and outside of the classrooms and guide students accordingly. The fourth strongest standard was instructional planning and strategy. This finding also supports the results of earlier research where teachers are supposed to carry out lesson planning on daily basis before conducting the classroom teaching (Shakir et al. 2021). The fifth strongest standard was assessment that this study explored. This finding too positively supports the importance of assessment in education. The finding is in line with numerous previous research studies which have accepted assessment as being the most important element of teacher education practices (Zheng, 2009). The sixth important standard that this study explored was learning environment. This finding of the current study too supports the results of previous research.

According to teacher education scholars the most important element of successful instruction is planning and implementing a truly interactive and supportive learning environment. Studies have reported a strong positive correlation between learning environment and students' learning outcomes (Qureshi & Kalsoom, 2022). The seventh most important standard was discovered to be effective communication and use of communication technology. This finding strong relates to the results of previous studies where use of technology has been declared to be an essential part of effective teaching and learning. All national education policies have made use of instructional and communication technology as the foundation of modern teaching education and hence the use of multiple technology tools has been declared to be compulsory at all levels of education (Alshurfat, 2016; Munawar et al. 2020).

This study found that the eight most essential standard was collaboration and partnership. This also strongly supports the findings of earlier research that schools are community centers and teacher must connect to parents and community. Hence, this practice has also been implemented in the education system where parent teacher councils have been formed to promote strong relationship between parents and schools and parents and teachers. This current research found that the ninth strongest standard was continuous professional development. This finding also supports many findings of previous research studies which have documented the importance of teacher training and continuous professional development as important factor of quality education (Altaf & Saeed, 2019). Studies have reported that teacher need to be provided training on latest and updated tools of instruction and their teaching skills must be improved (Aslam, et al. 2021). Last but not the least. The tenth important and strongest standard was teaching of English as a foreign language. Previous studies have also highlighted the importance of English as international lingua franca.

Being the official language of Pakistan, its importance in teacher education is manifold. It has been documented in all the national educational policies that English will be used as a medium of instruction at all levels of education (Angaiz et al. 2021).

Conclusion

This study aimed to develop a scale to measure teacher educators' beliefs regarding the quality of teacher education standards in Pakistan. The study concluded that PSTES was a reliable and valid scale which can be used by teachers and other practitioners to measure the professional standards of teacher education. The scale meets all the parameters and requirements for initial validation of an instrument based on psychometric rules. The study provided strong support for the factor loadings for all variables of the scale which were within the acceptable range. The strong mean score of each item with the good commonality values also provided strong support for the validity of the scale. It is suggested that the scale may be used to measure perspectives of teacher educators and other stakeholders for the improvement of teacher education system.

Limitations and Future Direction

The current study was conducted in the area of teacher education in Pakistani context with a small number of sample. However, it is further suggested that future studies may be conducted in other fields and area for further validation of the scale and its refinement.

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