Development and Validation of Teachers' Performance Appraisal Scale (TPAS) for Public Primary Schools of Punjab

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Abstract

The purpose of research in hand was to develop and validate Teachers' Performance Appraisal Scale (TPAS) to appraise the performance of public primary school teachers of Punjab (Pakistan). The five distinctive dimensions of performance through TPAS were teaching-learning, classroom management, assessment, teacher-student relationship and staff collaboration. Data were collected from 1080 male and female public primary school teachers from nine districts with low, average and high school performance. The experts' opinion was also incorporated in order to enhance content validity of TPAS. The reliability coefficient of TPAS was observed as (α=.915). The current TPAS comprised on 28 statements. Confirmatory Factor Analysis (CFA) and Exploratory Factor Analysis (EFA) were also carried out. The factor loading of all factors and items were above the threshold value 0.50. The findings of said research indicate that current TPAS is valid and capable in order to appraise performance of public primary school teachers. It is recommended that TPAS may be used by the authorities for teachers' appraisal for the improvement of quality of teaching and learning in primary schools.

Introduction

Quality teaching is the key determinant for quality learning and quality of teaching-learning guarantees the quality of education at all the levels of schooling. The quality of primary schooling is very crucial for the new generation from many perspectives. It not only lays foundations for future learning but also transforms their behaviors, life practices, personality and motivation for becoming self reliant civilized citizens. The flourishing of education system is not possible without high performing and devoted teachers (Nazir & Islam, 2017). According to Akin (2016) the prestige of educational institutes is strongly associated with performance of teaching staff. The low performance of teaching staff will ultimately affect

achievement level of learners and educational goals as well (Tambrin *et al.,* 2021). A large number of organizations around the globe are providing rating to their employees about their performance (Gorman *et al.,* 2017).

Different countries and nations are putting their effort to develop a pool of talented teaching staff and to boost up their effectiveness (Derrington & Campbell, 2018). Performance appraisal (PA) is an ongoing procedure being utilized by various organizations in order to assess the performance of their employees in accordance with pre set targets (Tong & Arvey, 2015; Na-Nan *et al.,* 2020) and to address area of improvements of staff (Shahzad *et al.,* 2016). It is very useful and fundamental process in order to channelize the potential of human resources (Ibeogu & Ozturen, 2015; Su *et al.,* 2017). It is a source of employees' motivation, job satisfaction and organizational progress (Chahar, 2020; Saeed & Shah, 2016; Singh & Rana, 2015). The statistics related to employees' performance is a basic demand for identification and sustainability of apex performers of an organization (Aguinis & Bradley, 2015). The key purpose of employees' appraisal is not only improvement of their working capacity rather it is connected with decisions regarding their promotions and financial benefits (Ameen & Baharom, 2019; Idowu, 2017; Jacobson & Sowa, 2015; Saharuddin & Sulaiman, 2016). Implementation of a transparent appraisal mechanism is very helpful for employees' retentions, their career growth and long run progress of organization (Azeez, 2017).

The rising trend of competition in educational institutions also causes an increase in evaluation and appraisal of educational institutes and their staff as well (Haughney *et al.,* 2020). Performance appraisal practices in educational organizations are in use just as a formality (Sulkowski *et al.,* 2020). There are a various methods and approaches of staff appraisal being used in educational sector throughout the world (Birdsall, 2018; Kallio *et al.,* 2017). It is also notable that numerous researches have been conducted to discuss the ways regarding improvement of performance appraisal (DeNisi & Murphy, 2017).

The feedback of employees of any departments about performance appraisal mechanism is a major factor for success or failure of that system (Pichler *et al.,* 2016). Ansari and Bijalwan (2017) stated that organizations should focus on development of strategies for retention of employees as well as organizational success. According to Upadhyay *et al.* (2020) there is a significant link among performance appraisal, organizational performance and staff turnover.

According to Iqbal *et al.* (2015) employees of public sector are not too much interested in appraisal process and take it as a routine procedure for the sake of promotion and award mechanism. Teachers' performance appraisal is a growing domain of research as there is not enough awareness regarding appraisal process, its execution and fairness in education sector (Cappelli & Conyon, 2018). Teachers' evaluation in public sector institutes of Pakistan is rare as well as not implemented in its real gist (Khan *et al.,* 2017).

The instrument used for staff appraisal must be comprehensive and user friendly as well as it must be a reflection of organizational functions (Aguinis & Burgi-Tian, 2021; Rusu *et al.,* 2016). There is demand of innovative and internationally recognized appraisal methods based on continuous and constructive feedback instead of traditional methods of employees' appraisal (Trost, 2017). According to Sułkowski *et al.* (2020) there is lack of abundant and holistic mechanism of teacher performance appraisal. It is further stated that performance

appraisal mechanism in educational institutions is not well organized, wastage of time and resources, improper scales are in practice in order to measure teachers' performance. Appraisal systems that are really helpful for improvement of teaching staff and nurturing their professional skills and effectiveness are very rare (Darling-Hammond *et al.,* 2013).

Teaching and learning is a basic component of teachers' appraisal process (Sánchez-Almeida *et al.,* 2020). Malunda (2019) stated that there is a well established linkage between teaching-learning process and staff performance appraisal in educational settings. According to Akin (2016) prestige of education sector is linked with quality staff performance that is based on teaching-learning process. Veloo *et al.* (2013) stated that appraisal process of teachers is helpful to improve their teaching-learning activities and assessment practices.

The word "classroom management" is associated to a specific process for development of an environment in classroom setting that is not only suitable to improve academic activities of students but also boost up their social and life skills (Kumar & Liu, 2019). Subject related knowledge and quality of instructions during learning process are key indicators of teachers' performance appraisal (Hallinger, 2019). Suleman and Gul (2015) stated that classroom management practices of teachers are basic factor of teachers' appraisal. Classroom management relates to well organized arrangement of classroom and suitable practices of classroom manners to develop discipline habits in learners (Kwok, 2017). According to Marzano (2003) well organized classrooms by teachers during teaching and learning process boost up the impact on students' learning, academic assessment as well. Effective teacher appraisal system during teaching process plays a dynamic role to enhance teachers' classroom management practices (Stronge, 2006).

Teachers' performance evaluation is a two layer process that emphasis on the nurturing of pedagogical skills of teachers and assessment practices as well (Marzano, 2012; Marzano & Toth, 2013). Sánchez-Almeida *et al.* (2020) stated that learners' assessment is a basic factor of teachers' performance appraisal. Assessment of learners' personal files is really helpful for teaching effectiveness (Usman, 2015). According to Veloo *et al.* (2013) teacher' evaluation process is useful for teachers to enhance their teaching practices, students' assessment and classroom management strategies.

Teacher-student relationship is a fundamental and significant factor of teachers' appraisal (Sánchez-Almeida *et al.,* 2020). A secure teacher-student affiliation is helpful to minimize learners' externalizing problems, stimulate behavior and improve their learning proficiency (Granot, 2016). A fair teacher-student relationship is helpful for teachers to be familiar with psychology of their learners and their academic achievement (Fowler *et al.,* 2008; Ma *et al.,* 2022; Hamre & Pianta, 2001). Reinke *et al.* (2016) stated that level of teacher-student relationship is helpful for teachers to understand and eliminate students' behavioral disorders. A positive teacher-student relationship is useful to improve learners' behavior in classroom (Bohn *et al.,* 2004). A constructive teacher and student affiliation plays a vital contribution in grooming of their learning and build up of life skills (Croninger & Lee, 2001; Crosnoe *et al.,* 2004; Hamre & Pianta, 2001; Meehan *et al.,* 2003).

Varma *et al.* (2021) stated that level of staff collaboration has an influence on performance appraisal process and its consequences. The nature of staff collaboration of an organization is a factor of success or failure of performance appraisal (PA) system (Pichler *et al.,* 2016). Teachers' performance appraisal is not concerned with teachers' individual entity, rather it

is linked with their mutual interaction and collaboration (Ceschi *et al.,* 2014). According to Stronge (2010) PA is very useful for teachers to mobilize their social linkages with their staff members. Scott and Einstein (2001) were also of the view that staff collaboration and team work affect appraisal practices in an organization.

Methodology
The methodology used for this study is as follows:

Step-I (Construct Development)
A scale is combination of standardized questions, mostly known as items, which follow a specific pattern regarding collection of data related to pre defined constructs (Lavrakas, 2008). The prime objective of a scale development process is to compile a valid and suitable measure of a particular construct (Clark & Watson, 1995). There are three stages of a scale development process (Bearden *et al.,* 2003; Hinkin, 1995). In first step of scale development process, construct is developed, in second step, items aregenerated and in third step, developed scale is evaluated (Daigneault & Jacob, 2014; Hinkin, 1995; Sousa & Rojjanasrirat, 2011).
There are two approaches to create items for a scale known as inductive and deductive approaches (Hinkin, 1995). In inductive method, item generation process based on responses of individuals (Hinkin, 1995). According to Morgado *et al.* (2017) data collected through observations, responses of focus group discussion may be used for items generations of scale. In deductive method, items development for a scale depends upon review of related and relevant literature as well as in depth assessment of existing scales (Hinkin, 1995). The researcher may utilize existing literature, interviews of the experts of related filed, or Delphi technique, or a blend of existing literature and interview may be used for item development purpose (Gunawan *et al.,* 2021).
The researchers used blend of both inductive and deductive methods for generation of themes and items during current study for development of Teachers' Performance Appraisal Scale (TPAS). The "teacher performance" construct was operationally defined in term of five dimensions namely: Teaching and learning, classroom management, assessment, teacher-student relationship and staff collaboration. These five dimensions were finalized based on the related and relevant literature review and interviews of head teachers and teachers of public primary schools and educational administrators of public sector. The researchers interviewed 12 primary school teachers, seven primary school head teachers and five educational administrators. The number of research participants for the purpose of interview varies from one to 50, depends upon the span of the research, the value of collected data and design of the research (Morse, 2000). According to Gunawan *et al.* (2021) usually the researchers do not conduct interviews for the purpose of items and themes generation. A combination of both inductive and deductive approaches for items development for a scale is considered as best practice (Boateng *et al.,* 2018).

Step-II (Items generation)
Initially, an item pool based on 57 items was developed representing the afore mentioned five dimensions of teachers' performance. First factor "Teaching and learning" consists of 11

statements, second factor "classroom management" contains 13 statements, third factor "assessment" 11 statements, Fourth factor "teacher-students relationship" contains 12 statements and fifth factor "staff collaboration" contains 10 statements. The response scale of TPAS vary from lowest to highest as 1= Never,   2= Rarely, 3= Sometimes, 4= Often, and 5= Always.

Step-III (Scale Validation)
In third step of scale development process, the researcher hires the services of six experts for content validity. Out of six experts two were international and four experts were national. The feedback of international experts related to teachers' performance appraisal domain furnished their response through Google form. The local experts having more than 10 years experience in reputable public sector educational institutes. Out of total four local experts, one expert is related to English linguistic and one is related to national language (Urdu) expert. The other two experts were university professor related to education discipline. The appropriate number of experts in order to review a research tool ranges from two to 20 (Armstrong *et al.,* 2005). According to Zamanzadeh *et al.* (2015) recommendation of at least five experts is required for instruments checking with respect to chance agreement. The researcher also conducted pilot testing for said scale before conducting it on a large scale. According to Burns and Grove (2005) for the purpose of pilot testing at least 15 to 30 subjects are sufficient. The pilot testing was done by using a sample of 270 public primary school teachers. On the basis of comprehensive and critical feedback of experts' panel, and pilot testing, the TPAS was reduced to 28 items.

Data Collection
The data for current study was collected from 1080 public primary school teachers by using simple random sampling technique from nine districts of Punjab with low, average and high school performance. The data were collected by using online mode. There is variation in literature regarding sample size and their types in order to develop a scale (DeVellis, 2016; Hinkin, 1995; Iacobucci, 2010). According to Burns and Grove (2005), for the purpose of pilot testing at least 15 to 30 subjects are sufficient. In current research, seven features of research respondents' were analyzed like gender, marital status, age, qualification, teaching subject, length of service and school location. First, the data shows that female respondents are in majority as compared to male respondents. Female respondents were 63.1% and male were 36.9%. Second, there were 74.4% married and 25.6 % unmarried respondent. Third, there were 8.8 % respondents who were 21-25 years old, 30.7% were 26-30% years old, 28.4% fall in age group of 31-35 years, 12.1% falls in age group 36-40 years, 9.2 % falls in age group of 41-45 years and 10.7% were those who were more than 46 years old.

Table 1

Description of respondents

Description	n=1080	
	F	*%*
Gender (male=399; female=681)	36.9	63.1
Marital Status		

Development and Validation of Teachers' Performance Appraisal Scale (TPAS) for …

Single	276	25.6
Married	804	74.4
Age Group		
21-25 years	95	8.8
26-30 years	332	30.7
31-35 years	307	28.4
36-40 years	131	12.1
41-45 years	99	9.2
>46 years	116	10.7
Qualification level		
Graduation	92	8.5
Master	755	69.9
Ms/Mphil	233	21.57
Ph.D	10	0.92
Teaching Subject		
Science	374	34.6
Arts	384	35.6
Science & Arts	322	29.8
span of Service		
1-5 years	541	50.1
6-10 years	256	23.7
11-15 years	138	12.8
16-20- years	72	6.7
26 years & above	73	6.8
School Location		
Rural	818	75.7
Urban	262	24.3
Working sector		
Public	1080	100
Designation level		
Primary School Teacher (PST)	1080	100

Fourth, there were 8.5% respondents who have acquired graduation degree, 69.9 % respondents have acquired master degree, 21.57% respondents have acquired MS/M.Phil qualification and only 0.2 % respondents were those who have earned Ph.D degree. Fifth, there were 34.6 % respondents who teach only science subjects to their classes, the respondents who teach only arts subjects to their classes were 35.6%, and the respondents who teach both science and arts subjects are 29.8%. Sixth, the respondents having length of service 1-5 years were 50.1%, respondents having length of service 6-10 years were 23.1%, respondents having length of service 16-20 years were 6.7%, whereas, 6.8% respondents were those who have length of service 26 years and above. Finally, there were 75.7% respondents those who belong to rural areas school, whereas, 24.3% respondents were rendering their service in urban area schools.

Development and Validation of Teachers' Performance Appraisal Scale (TPAS) for …

Data Analysis

The data were analyzed by using confirmatory factor analysis through Varimax Rotated Principal Axis. The basic purpose of Confirmatory Factor Analysis (CFA) is to assure that selected items are valid and reliable (Fish *et al.,* 2016). The coefficient of reliability for TPAS was calculated as 0.915 and measure of sample adequacy was observed as more than 0.6 (Kaiser, 1974). Factor wise reliability of TPAS is also given in Table 2.

Table 2

Factor Wise detail of scale

Sr. No.	Factors	Items	Factor wise reliability	SD	Mean	Reliability of Scale
1	Teaching and Learning	1-6	.701	3.002	26.49	
2	Classroom Management	7-11	.654	2.533	22.50	
3	Assessment	12-17	.772	3.537	25.91	.915
4	Teacher-Student Relationship	18-23	.828	2.675	28.25	
5	Staff Collaboration	24-28	.789	2.696	17.30	

The reliability value of first factor "teaching and learning" was observed as .701, second factor "classroom management" was .654, third factor "assessment" was .772, fourth factor "teacher-student relationship" was .828 and fifth factor was .789. Standard deviation (SD) value of all factors vary from 2.533 to 3.537 and mean value ranges from 17.30 to 28.25 of all factors is also explained in Table 2.

Table 3

Confirmatory Factor Analysis of scale

No.	Statements	Factor Loading
Factor I: Teaching and Learning		
1	I do proper lesson planning of teaching process.	.756
2	I use variety of audio video aids in teaching-learning process.	.714
3	I encourage students' constructive participation in teaching-learning process.	.707
4	I use variety of teaching methods to enhance students' understanding about topic.	.638
5	I focus on students' individual needs during teaching-learning process.	.608
6	I provide daily life examples related to topic during teaching-learning process.	.660
Factor II: Classroom Management		
7	I involve students in development of classroom discipline rules.	.648
8	I encourage students on an ideal behavior in class room.	.640
9	I take notice of students' unwanted actions immediately in classroom.	.621
10	I discourage students' misbehavior in a suitable way.	.609
11	I use different rewards to improve classroom management	.636

Factor III: Assessment

12	I use different assessment methods to assess students' learning.	.713
13	I use self made tests to assess students' learning.	.700
14	I use assessment results to improve teaching process.	.656
15	I share educational assessment results with students well in time.	.635
16	I discuss educational assessment results with family of the students.	.603
17	I maintain students' personal file / educational assessment record properly	.753

Factor IV: Teacher-Student Relationship

18	I maintain a pleasant relationship with all the students.	.705
19	I provide an environment of trust to all students.	.683
20	I pay attentions on character building of my students.	.565
21	I take care about students' self respect.	.508
22	Students discuss their learning problems with me, without any hesitation.	.713
23	I give value to students' suggestions regarding learning process	.700

Factor V: Staff Collaboration

24	I like to work in collaboration with other colleagues of my school.	.714
25	I openly discuss my teaching problems with other colleagues of my school.	.713
26	I participate in collective teaching activities at school.	.504
27	I participate in non academic activities of school.	.683
28	Teachers of my school support me to improve my professional performance.	.665

In Table 3, item wise Confirmatory Factor Analysis (CFA) and reliability value has been presented. According to Hair *et al.* (2006) Cronbach's alpha value less than .06 is acceptable especially in exploratory nature researches and in the discipline of Social Sciences. The factorability of first factor "teaching and learning" was analyzed as alpha value observed as .756, .714, .707, .638, .608 and .660. The alpha values of all factors were above .06, which indicates a strong relationship with teaching and learning. The factorability of second factor "classroom management" was calculated as .648, .640, .621, .609 and .636. All alpha values were above .06 which expresses a strong relationship with "classroom management". Similarly, the factorability of third factor "assessment" was calculated and alpha valued observed as .713, .700, .656, .635, .603 and .753. The alpha value is above .06 which indicates a strong relationship with factor "assessment". Further, the factorability of fourth factor "teacher-student relationship" was analyzed and alpha value of all statements observed as .705, .683, .565, .508, .713 and .700. The range of alpha values is above .05 that shows a strong relationship with factor "teacher-student relationship". Finally, the factorability of fifth factor "staff collaboration" was observed as .714, .713, .504, .683 and .665. The alpha values of all statements except one statement were observed above .06 that reflects a strong relationship with factor "staff collaboration".

Development and Validation of Teachers' Performance Appraisal Scale (TPAS) for …

Construct Validation
Table 4
Inter-Factor Correlation

Factor	T&L	CM	ASST	TSR	SC
T&L	1	.555**	.633**	.539**	.488**
CM	.555**	1	.649**	.582**	.491**
ASST	.633**	.649**	1	.602**	.560**
TSR	.539**	.582**	.602**	1	.531**
SC	.488**	.491**	.560**	.531**	1

Note. T&L: Teaching and Learning, CM: Classroom Management, ASST: Assessment, TSR: Teacher-Student Relationship, SC: Staff Collaboration.
Table 4 shows correlations between five factors of the TPAS. Moderate to strong correlation has been observed among five factors of TPAS, with coefficients ranging from .48 to .64. The lowest correlation ($r = .488$) was observed between *Teaching and Learning* and *Staff Collaboration.* Whereas, the highest correlation ($r=.64$) was found between *Classroom Management* and *Assessment.*

Table 5
VIF, CR, AVE, and CITC for construct Validation

Factor	VIF	CR	AVE	CITC
T&L	2.35	0.87	0.53	0.78
CM	2.36	0.76	0.52	0.68
ASST	2.32	0.88	0.61	0.79
TSR	2.35	0.75	0.53	0.66
SC	2.31	0.85	0.51	0.78

Note. T&L: Teaching and Learning, CM: Classroom Management, ASST: Assessment, TSR: Teacher-Student Relationship, SC: Staff Collaboration,
Table 5 illustrates an overview of variance inflation factor (VIF), composite reliability (CR), average variance extracted (AVE) and corrected item total correlation (CITC) values for construct validation. The VIF value of factors range from 2.31 to 2.36, CR values range from 0.75 to 0.88. The AVE values range from 0.51 to 0.61 and CITC values range from 0.66 to 0.79. AVE value should be more than 0.5, but a value less than 0.5 is also acceptable where Cronbach alpha and Composite Reliability values are more than 0.7 (Fornell & Larcker, 1981; Muhammad *et al.,* 2016; Mahjoub & Naeij, 2015; Huang et al., 2013; Chinomona & Pretorius, 2011).
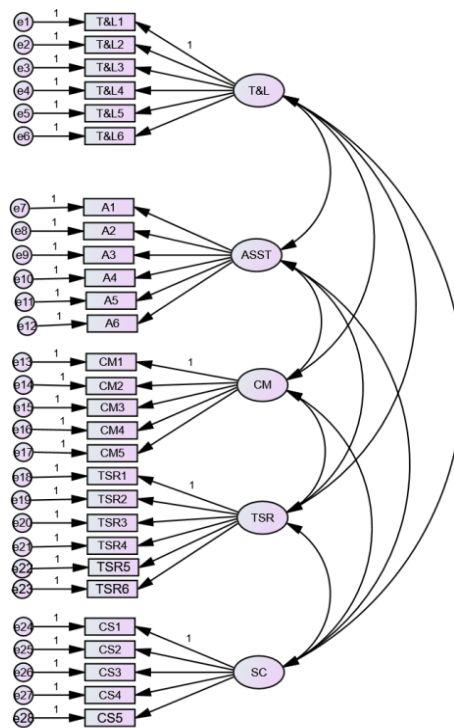
Development and Validation of Teachers' Performance Appraisal Scale (TPAS) for …

Table 6
Model Fit Indices of TPAS

Model	CMIN	df	p	CMIN /DF	RMR	GFI	AGFI	RMSEA	CFI
Model fit	1193.472	3	.011	3.801	.07	.916	.973	.051	.909

Table 6 shows a glimpse of model fit indices of TPAS. The construct validity of TPAS was observed as a good fit with measures CFI=.909, RMSEA<.07, RMR=.07, GFI>.90 and p>.05. The root mean square error of approximation (RMSEA) value for said scale is .051, which express that the model is best fit. Earlier researcher conducted by (Cudeck, 1993; Jöreskog & Sörbom, 1993) showed that root mean square error of approximation (RMSEA) value below .05 shows a close fit, and value below .08 represents an appropriate model fit. RMSEA value ranging from .08 to .10 represents a mediocre fit but its value below .08 represents a good fit (MacCallum *et al.,* 1996; McDonald & Ho, 2002). According to Hu and Bentler (1999), RMSEA value below .06 and comparative fit index (CFI) above .95 represents relatively good model fit. Recent studies also show that in case of factor loading above .07, the value of RMSEA shows an increasing trend (McNeish *et al.,* 2017; Savalei, 2012). The basic purpose of Confirmatory Factor Analysis (CFA) is to check whether the model fits reality (Knekta *et al.,* 2019).

Figure 1
Confirmatory Factor Analysis of TPAS

Discussion

The study at hand is an endeavor to develop a scale in order to evaluate the performance of public primary school teachers. Performance appraisal is an attempt to unfold the hidden potential of staff and provide them a reflection of their performance. Appraisal is an effective and productive process to gear up human resources (Edoziem & Nwideeduh, 2020; Ibeogu & Ozturen, 2015; Su *et al.,* 2017). The prime objective of teaching staff is to conduct academic and non academic activities in a successful manner (Hamid *et al.,* 2012). Reliability values of 28 items of TPAS scale express sufficient internal consistency and homogeneity of scale. The study in hand supports as well as is an extension of the earlier researches (Farooqi *et al.,* 2013; Nadeem *et al.,* 2014; Nadeem *et al.,* 2020) with an addition of items related to teacher-student relationship and staff collaboration. The present scale may be helpful in order to obtain a real picture related to performance appraisal of public primary school teachers and ultimately lead them to boost up their performance.

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