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MEASURING TEACHER EFFECTIVENESS DEVELOPMENT OF A SHORTER VERSION OF TEACHER EFFECTIVENESS SCALE (TES)

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ABSTRACT

Effective teachers are considered to impact not only academic but also social and attitudinal outcomes of students. The question 'what makes a teacher effective' has been long researched. Several methods have been used to measure teacher effectiveness (TE) and each has its own merits and drawbacks. Teacher Effectiveness Scale (TES-KU) developed by Kulsum (2011) is frequently used to assess effectiveness of school teachers. This 60-item scale was used in a research study where most of the subjects found it time-consuming and laborious. Hence, an effort was made to develop a shorter version of this scale. Responses from 200 school teachers were Factor analyzed using Principle Component method. 25 items with highest factor loading were selected. When researchers need to use multiple scales in their work, this shorter scale (TES-S) would be more practical. Details of method of selection, scoring and interpretation are given in the paper.

Keywords: *Teacher Effectiveness, TES Scale, Short Scale of TES, TES-S.*

Introduction

Teachers play a key role in the educational system. The role of Primary school teachers in shaping the young minds can never be underestimated. It is also true that some teachers seem to be more effective than others in influencing students. There has been considerable research to identify factors that make a teacher 'effective'. But 'teacher effectiveness' (TE) has no single definition nor a single agreed-upon list of characteristics. Effectiveness of education is dependent on effectiveness of teachers. If so, conceptualizing what is TE becomes crucial. Sifting through hundreds of definitions, the National Comprehensive Centre for Teacher Quality has come up with a five-point definition of TE (Little, Goe, & Bell, 2009) that has following characteristics: the teacher will have high expectations of all students and help them to realize the goals; effective teacher will contribute to positive academic, social and attitudinal outcomes of students; effective teacher will use diverse resources to plan and structure learning opportunities; such teacher will contribute to value diversity and civic mindedness in schools and finally, effective teacher will collaborate with others such as colleagues, parents, schools administration.

How and to what extent wills effectiveness of a teacher impact the student has been a question that has led to several studies. Clinton et.al (2016) considers evaluating the performance and impact of teachers as an integral part of ensuring the quality and effectiveness of teaching. They also propose a model that incorporates different dimensions of teacher effectiveness. Their model of effective teaching has components such as – Teaching (subject matter knowledge, instructional practice, etc.); Teacher as a person (communication, psychological resources etc.); Behaviour as teacher (adherence to professional standards etc.); and Continuous learning (skills and specializations) that will impact

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students, colleagues and parents (ibid, 2016). Creemers, an influential figure in this field of study in his Educational Effectiveness Research (EER) is said to have linked different areas of research in the area of TE (Muijs, 2008). EER attempted to establish and test theories to explain differences in effectiveness of teachers. It is also pointed out that three terms – school effectiveness, teacher effectiveness, and educational effectiveness – are used inconsistently in the literature. Muijs (ibid) attempts to distinguish between these three though they are interrelated.

Over the past decade, research has confirmed that teachers have substantial impacts on their students' academic and life-long success (Chetty, Friedman, & Rockoff, 2014). Researchers have studied TE on social and behaviour skills in early elementary school (Jennings, & DiPrete 2010), on dropouts from schools (Koedel, 2008); attitudes and behavior (Blazar,2016); development of academic, language and social skills (Mashburn et.al, 2008); student achievement (Rockoff, 2004), and several interpersonal outcomes in the life of the child (Pianta et.al 2002). Decades of research in this area has also confirmed that teachers vary considerably in their ability to influence the students. This has led to the search for academic and non- academic factors that affect TE.

Stronge (2011) asks the question – 'what makes good teachers good?' Researchers have examined factors such as gender (Islahi & Nasreen, 2009); instructional practice (Grossman et.al. 2013) and teacher-student matching (Clofter et al, 2006). Teacher incentives (Fryer,2013); institutional and personal factors (Hill, Blazar & Lynch, 2015), teacher preparation (Boyd et.al 2008) and teacher training (Harris & Sass, 2011) are some other factors examined. Generally, effective teachers plan their classes carefully. They use appropriate materials to teach. They clearly communicate the learning goals to students. They also continuously assess students on a regular basis. Using a variety of teaching strategies, appropriate use of classroom time and maintaining discipline are part of effectiveness.

Since findings about TE have impact on education policy and reform, its measurement becomes a priority. Clinton (2016) observes that the quality, validity and reliability of tools currently available vary significantly across countries and contexts. Classroom observation (Ho, & Kane, 2013), Principal's rating (Jacob & Lefren,2008); and combined subjective and objective evaluations (Rockoff & Speroni, 2010) have been used. Berk (2005) lists twelve types of measures. Kane et. al (2011) report 'Widget effect' in TE, i.e. classroom observation provides little information as 98% of teachers are blandly evaluated as 'satisfactory'. Efforts have been made ask teachers to assess themselves on their own perceived efficacy. In Indian setting, Teacher effectiveness scale (TES) developed by Kulsum (2011) is frequently used with school teachers. Researchersin the education field often use several questionnaires and schedules in their study. An easy and reliable method to assess TE would be useful to them. The present study attempts to develop a shorter version of TES that would meet such a need.

Present Study

Researchers studying TE in schools need a convenient method to assess the same. Standardized scales provide a good alternative to observation or Principal's ratings. The objective of the present study was to develop a shorter version of TES.The original scale is described as a self - anchoring striving scale by the author (Kulsum 2011). The scale has 60 items covering five areas : Preparation and planning for teaching (PTP); Classroom management CRM); Knowledge of subject matter and its delivery (KSM); Teacher characteristics (TC); and Interpersonal relations (IPR). The scale has Split-half reliability of 0.68; Test- retest reliability of 0.63 and satisfactory validity. This scale was one of the many used in a larger research study conducted in schools of Bangalore Rural and Urban Educational districts. This paper reports only data pertaining to modification of the TES.

Sample was drawn from 100 schools, 50 rural and 50 urban, in Bangalore educational districts. Basic details of the sample are given in Table .

Table 1: Sample Characteristics.

Gender	Rural	Urban	Total
Male	35	17	52
Female	65	83	148
Total	100	100	200

As can be seen from the table, there were more female teachers in the sample. Most of the subjects were married. Mean age of the sample was around and average age of service was around 20 years.

- **Procedure:** TES test booklet gives detailed instruction to subjects. Picture of a ladder with steps marked from 0 to 10 is shown in the booklet. Respondents are asked to read each statement and imagine where they are 'now' on the ladder and where they will be in 'next three years' (future) and mark the appropriate numbers in the two cells given against each statement. The responses in the second cell (future position) are not scored. It is only supposed to provide a context to rating self in the present. There is no time limit and possible scores range from 0 to 600. For this study, the scale was translated to Kannada using prescribed method as most teachers were not comfortable with the English version.
- **Need for Modification of the Scale**: During the administration of TES, several problems were reported by teachers. Almost all the subjects complained that it was too long. They had to make two ratings for each statement (total 120 responses) that took almost an hour. In some cases, after a few statements, subjects started omitting the second cell (future position). Some got bored halfway and would simply tick off the responses without rating them. Such responses would affect the data collected on other scales. As a result, nearly 10% of completed schedules for the final study had to be discarded. Researchers cannot afford such data wastage. The scale was time-intensive both for the researcher and the subjects. A shorter scale would be more economical and productive in largescale studies. Based on data from 200 teacher, a shorter version was developed.
- **Analysis:** Factor analysis was used in this study to shorten the TES. Responses to TES given by 200 teachers were scored and subjected to Factor analysis. Factor analysis is the method to determine the number and nature of underlying variables among larger number measures. Kerlinger (1973) calls it 'a queen of analytic methods' (p.659). According to him, it serves the cause of scientific parsimony as it reduces multiplicity of measures to greater simplicity. It tells us which measures belong together or virtually measure the same thing and how much they do so. Factor analysis could be used to justify dropping questions to shorten questionnaires. *Principal components* are usually the default extraction method. It extracts uncorrelated linear combinations of the variables and gives the first factor maximum amount of explained variance. The factors that follow explain smaller and smaller portions of the variance and are all uncorrelated with each other. This method is considered appropriate when the goal is to reduce the data.

Results and Discussion

After factor analysing the responses of 200 teachers to the original TES, it was decided to retain the first 25 items that had highest loading on factor 1. Tables below give details.

Table 2: Summary of Factor Analysis

Factor	1	2	3	4	5
SS Loadings	19.645	11.774	5.785	4.915	1.692
Proportion Var	0.327	0.196	0.096	0.082	0.028
Cumulative Var	0.327	0.524	0.62	0.702	0.73

In order to shorten the scale, 25 items were selected. The item number in the original scale and the factor loading are given in table 3. Items that had factor loading above 0.60 have been retained for TES-S (TES-short scale). The subscale to which item belongs is given in parenthesis.

Table 3: Item Number in the Original Scale, its Description and Factor Loading

S. No.	No.on TES	Item description	Factor Loading
1	56 (CRM)	While teaching, I ask more thought provoking questions than fact finding questions.	0.764
2	59(CRM)	I do discuss with students their performance in tests.	0.76
3	31(TC)	I do possess pleasing manners.	0.749
4	41(TC)	I value my academic achievements.	0.748
5	57(TC)	I have love for my students.	0.743
6	37 (PTP)	The tests I intend administering to my students will be reviewed and improved upon by me.	0.741
7	38 (CRM)	My teaching is characterised by clarity.	0.736
8	46 (KSM)	I have a great deal of interest in the subject I am teaching.	0.733
9	48 (TC)	I show understanding and sympathy in working with my students.	0.731

10	45(CRM)	I guide my students in completing their assignments.	0.728
11	60 (IPR)	I consider my first duty to be devoted to get a good name to my school.	0.726
12	43(IPR)	I am reasonably obedient to my headmaster.	0.721
13	55(CRM)	I help students in their reference work.	0.714
14	44 (PTP)	I plan my lessons keeping in view the individual differences among students.	0.712
15	58 (PTP)	I plan my lessons based on the techniques tested and found suitable.	0.706
16	49 (PTP)	In the end, I am in the habit of summarizing the lesson I teach.	0.704
17	50 (CRM)	I encourage students to be punctual in their assignments.	0.688
18	51(CRM)	I am concerned with the maintenance of discipline in the classroom within the framework of democratic atmosphere.	0.687
19	53 (IPR)	I support the genuine causes of teaching community.	0.685
20	39 (KSM)	I discuss the content of the subject matter with ease and confidence.	0.683
21	47 (TC)	I provide a laudable example of my personal and social living to my students.	0.674
22	40 (TC)	I have pleasant and distinct voice.	0.669
23	35(TC)	My gestures in the classroom are pleasant and approvable.	0.657
24	33(PTP)	I organize the subject matter I teach to be in agreement with the course's objectives.	0.636
25	36 (TC)	I have a sense of duty and responsibility.	0.635

Table 4 gives the comparison between distribution of items on the five subscales in the original and the shortened scale. The subscales are coded as PTP (Preparation for Teaching and Planning), CRM (Class Room Management), KSM (Knowledge of Subject Matter), TC (Teacher Characteristics) and IPR (Interpersonal Relations).

Table 3: Showing the Number of Items in the Original and Short Scale

Subscales	PTP	CRM	KSM	TC	IPR	Total
Original Scale	11	14	7	17	11	60
Short Scale	5	7	2	8	3	25

In the original scale, TC had highest number of items followed by CRM and KSM had lowest. In the short scale also, similar trend is seen. But items on IPR are substantially reduced while PTP has more items. It was felt that these items would be sufficient to extract information about teacher effectiveness on all the five dimensions of the scale in shorter duration.

Scoring and Interpreting the TES-S

In TES-S, subjects are instructed to read each statement and rank their *present* level of effectiveness on a scale of 0 (lowest) to 10 (highest).Otherwise, the instructions and descriptions will be the same as TES. Scores can range from 0 to 250. In the original scale also, the 'future' ranking is not considered for scoring. Hence it is omitted here. If the scale is administered to a group of subjects, then taking Mean score of the group + or – One S.D. is preferred to classify subjects as high or low on effectiveness. Another alternative is to take the Median score of the distribution. For individual administration, interpretation would be as follows:

Description	Score on TES	Score on TES-S
Average Teacher	> 320	> 133
Most Effective Teacher	>435	>181
Most Ineffective Teacher	< 252	< 105

A score below 133 in TES-S indicate below average effectiveness. It can be seen in Table 3, that 2 or 3 items from one area may come one after the other. Items were rearranged to ensure that items referring to the five areas are more evenly spread. This rearranged final version is given in the Appendix A for the for the convenience of future users. The next step was to administer this short version to a smaller group from original sample and compare the two scores. However, this was not possible as due to Covid pandemic, none of the subjects were available. Online test and phone-in were not feasible with this sample. This could be taken up as a future project at a more opportune time

Conclusions

Since the 60 item TES was found to be time consuming a shorter version was developed. Data from 200 primary school teachers who had answered the original TES were Factor analyzed using Principal component method. 25 items with maximum factor loading were selected for a short scale.This shorter version, TES-S is much more practical and simpler. It will be useful to researchers who have to use multiple methods in their study.

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Appendix A: Teacher effectiveness Scale- Short version (TES-S)

1.I have a great deal of interest in the subject I am teaching.

2.I plan my lessons keeping in view the individual differences among students.

3.I help students with their reference work.

4. I have a sense of duty and responsibility

5. I encourage students to be punctual in their assignments.

6. I organize the subject matter I teach to be in agreement with the courses' objectives.

7. I show understanding and sympathy in working with my students.

8.I support the genuine causes of teaching community.

9. I guide my students in completing their assignments.

10. In the end I am in the habit of summarizing the lessons, I teach.

11. I do discuss with students their performances in tests.

12,I provide a laudable example of my personal and social living to my students.

13. I am concerned with the maintenance of discipline in the classroom within the frame work of democratic atmosphere.

14. I do possess pleasing manners.

15. I plan my lessons based on the techniques tested and found suitable.

16. I have love for my students.

17. I consider my first duty to be devoted to get a good name to my school.

18. while teaching, I ask more thought provoking questions than fact finding questions.

19.I have pleasant and distinct voice.

20. The test I intend administering to my students will be reviewed and improved upon by me.

21. I am reasonably obedient to my headmaster.

22. I value my academic achievements.

23. My teaching is characterized by clarity.

24. I discuss the content of the subject matter with ease and confidence.

25. My gestures in the classroom are pleasant and approvable.

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