Research Paper

Construction and Standardization of Teaching Effectiveness Observation Scale (TEOS)

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ABSTRACT

This paper has been designed to construct and standardize the observation scale to measure the Teaching Effectiveness of school teachers. A series of steps were followed to develop and standardize the scale such as planning, preparing first and second draft of items, item writing and analysis, finalizing of items, scoring, reliability, validity and setting of norms. For the first draft of the scale, 90 items were written for five dimensions of the scales i.e., planning of the lesson, execution, classroom management, professional and personal competence of teacher and, closing the lesson. The scale was given to 20 experts belonging to the field of education, sociology, psychology and language for expert review. 15 teachers were also observed by the investigators to observe the likeliness of items. On the basis of unanimous decision 75 items were retained for the second draft. The final draft was administered on randomly selected sample of 100 teachers from the secondary and senior secondary schools of Haryana. Final selection of the items was done by applying t-test computation. Only those items were retained which were found to be significant at 0.05 or at 0.01 level. Thus, out of 75 items 19 items were rejected and 56 items (significant items) were retained for the final draft. Reliability of the scale was determined by test-retest (0.727), split-half reliability (0.970) and internal consistency method (which ranges from 0.195 to 0.555). The coefficient of correlation between the dimensions of teaching effectiveness ranges from 0.353 to 0.688 which indicates high validity. z-Score norms have been prepared to determine the level of teaching effectiveness.

Keywords: *Teaching Effectiveness, Observation Scale, Teachers*

Teaching is an art and the quality of teaching depends on the love and dedication of the teacher towards their subject. The quality of education as well as the future of our nation largely depends on the quality of teachers and their teaching. They are the assets of any country and are very important for education system. They have the responsibility to guide, encourage, and facilitate students. Effectiveness of teaching can be defined as the amount of progress students make to achieve the defined objectives. According to Evans (2006)[5] "teaching effectiveness is a measure of the extent of realization of the instructional objectives". Additionally, Cheng and Tsui (1996) [3] constructed a

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framework of teaching effectiveness and explained that it is a multi-domain and multi-level system. They argued that teaching effectiveness consists three domains (affective, cognitive and behavioral) and three levels (individual, group and school levels). In short, the effectiveness of teaching directly depends on the quality of effective teachers.

Over the decade, many researchers have investigated the role of teaching effectiveness in the learning outcome of students. Teaching effectiveness of teachers is noted to be closely connected to their work performance, ability to innovate & integrate new ideas into their own practice as well as having an important influence on student's achievement & attitude towards school (Seema, 2015)[14]. It also makes teachers more sensitive towards their work (Godiyal, 2015)[8]. Moreover, it is the impact of classroom factors such as teaching methods, teaching expectations, classroom management and the use of classroom resources on student's performance (Awasthi & Bihari, 2014)[1] and represents the eligibility, personality, behavior, mastery of content and teaching style of a teacher. These teachers are able to adapt their knowledge and skills according to the needs of the learner and situation. In addition to this, the effective instructional management also brings out high teaching effectiveness (Gupta and Goel, 2016)[7]. Therefore, it is very necessary to improve the quality of teachers' teaching (Dash & Barman, 2016)[4].

The high or low teaching effectiveness greatly depends on the dispositions of a teacher. Walker (2010)[16] proposed that twelve characteristics i.e., being prepared, positive, high expectations, creative, fair, having sense of humor, gives personal touch, develops a sense of belonging, admits mistakes, gives respect to students, forgiving and compassionate nature has significant effect on the effectiveness of teaching. Kosegi et. al., (2013)[10] supported this view by finding a significant relationship between teachers' attributes and the academic performance of the students. In addition to these characteristics, the gender of a teacher also determines their teaching effectiveness. Sagar and Parveen (2017)[15] reported that female teachers have high teaching effectiveness than male teachers. Furthermore, the effective teaching is also determined by the classroom management ability, morale of the teacher, self-efficacy, emotional intelligence, personality, and burnout level of a teacher. Therefore, it may be concluded that the effectiveness of teaching depends on several internal and external factors.

Need to Develop the Teaching Effectiveness Observation Scale
Specific measures of evaluation are necessary to identify particular strengths & behavior which individual teachers can improve (Pagani & Seghieri, 2002)[12]. Evaluation is important because through evaluation, performance & effectiveness can be determined. It allows an educator not only to improve teaching practices but also helps in achieving the organizational goals. Berk (2005)[2] identified the sources for measurement of teaching effectiveness. These include student evaluations of teaching, peer reviews, self-reviews, interviews with student, ratings by principal and supervisor. Classroom observation can be a guide for teachers so that they can reflect on their own teaching practices. An observation process can be selected in terms of how structured they are; highly structured observation has a clear focus and involves carefully prepared schedules, rating scales and coding systems as compared to semi-structured and unstructured observation which has less focus. The review of a large number of instruments mentioned above revealed that a self-administrating instrument can be biased. Researches on the classroom environments have shown that direct observational scales can measure both teachers' and students' behaviors which can be manipulated to increase students' learning. Moreover, some dimensions related to teaching effectiveness were not covered in the available scales. Therefore, it was decided to

standardize an observation scale to measure teaching effectiveness of teachers with five dimensions which are explained below:

Objective of the Scale

The present scale was constructed to measure the level of teaching effectiveness among school teachers. It also measures the dimensions of teaching effectiveness i.e., planning of the lesson, execution (explanation, use of blackboard and others, and classroom interaction), classroom management, professional and personal competence of teacher and, closing the lesson.

Table-1 Dimensions of Teaching Effectiveness Observation Scale (TEOS)

Dimensions of TEOS	Operational Definitions
1) Planning of the Lesson	A fundamental procedure of constructing the lesson to achieve the course objectives. This process allows teachers to evaluate their and students' knowledge with regard to the content to be taught (Reed & Michaud, 2010)[13].
2) Execution	Execution of a prepared lesson can be defined as the teaching of lesson concept and content (Jangira & Jangira, 1995)[9].
a) Explanation	Explanation involves the presentation of the subject matter in a simplified form before the learners and making it understandable.
b) Use of Blackboard and Others	It involves the appropriate use of teaching aids. Use of media helps in learning process to be more effective (Nasab et. al, 2015)[11].
c)Classroom Interaction	This sub-dimension explains the level of communication among students and teacher.
3) Classroom Management	This dimension includes an integration of factors related to the organization and management of a class with the aim of creating safe and well-established learning environment
4) Professional & Personal Competence of Teacher	It is an accumulation of qualities of a teacher that helps in facilitating the learning of students.
5) Closing the Lesson	Lesson closure provides space for students to digest and assimilate their learning and to realize why it all matters (Ganske, 2017)[6].

Procedure for the Scale Development and Data Analysis

A series of steps were followed for the construction and standardization of the observation scale such as planning and preparation, first try out, second try out, item analysis, final draft, reliability, validity, scoring and interpretation of raw scores which are explained:

Planning and Preparation of the Observation Scale: The items for the scale were written in both English and Hindi language and administered on secondary and senior secondary school teachers. For the first draft of the scale, 90 items were written by keeping the dimensions of teaching effectiveness in mind.

First Try-Out: After reviewing the literature, it was decided to write the items complimenting the teaching skills for every dimension. In the beginning, 90 items were written and evaluated by the experts. After the extensive review and observation of teachers; 75 items were retained for second draft of scale. A detailed table of number of items are given below:

Table-2 Dimensions of Teaching Effectiveness Observation Scale and Number of Items in the First and Second Draft

Dimensions	Number of Items in First Draft	Number of Items in Second Draft
Planning of the Lesson	15	5
Execution	25	37
Classroom Management	20	12
Professional & Personal Competence of Teacher	24	16
Closing the Lesson	6	5
Total Items	**90**	**75**

Second Try-Out

In order to determine the homogeneity, applicability, and item analysis, the second draft was administered on a sample of randomly selected 100 teachers teaching in secondary and senior secondary schools of Haryana State. All the teachers were observed by the investigator for the duration of their lecture and rated on the basis of their teaching. Responses of the items were expressed in terms of five options: Most Effective, More Effective, Effective, Less Effective, and Least Effective. The items were scored as 5, 4, 3, 2 & 1 respectively.

Item Analysis

After scoring, all the sheets of 100 respondents were arranged in decreasing order. Then, 27% upper group (27 top teachers) and 27% lower group (27 bottom teachers) were selected and subjected to mean, S.D and t-test. The items which were significant at either 0.01 level or 0.05 level of significance were retained. Thus, out of 75 items 19 items were rejected as they were found to be not significant. For the final draft of the observation scale 56 items were retained. Table 3 shows the significant difference between the two groups of the teachers:

Table-3 Item Analysis based on Mean Difference between Upper (27%) and Bottom (27%) Criterion Groups of TEOS

Item No.	Groups	Mean	't' value	Item No.	Groups	Mean	't' value	Item No.	Groups	Mean	't' Value
1.	Upper	3.20	2.93**	26.	Upper	3.85	3.42**	51.	Upper	3.40	4.50**
	Lower	4.11			Lower	4.33			Lower	4.03	
2.	Upper	2.96	4.62*	27.	Upper	3.33	3.50**	52.	Upper	3.18	3.70**
	Lower	3.70			Lower	3.96			Lower	3.92	
3.	Upper	3.29	2.73**	28.	Upper	3.22	2.06*	53.	Upper	3.74	3.42**
	Lower	3.70			Lower	3.66			Lower	4.22	
4.	Upper	2.81	4.66**	29.	Upper	2.03	4.65**	54.	Upper	2.96	5.28**
	Lower	3.51			Lower	2.96			Lower	3.70	
5.	Upper	3.74	4.66*	30.	Upper	2.07	4.58**	55.	Upper	1.70	1.85(NS)
	Lower	4.07			Lower	2.85			Lower	1.96	
6.	Upper	1.70	2.70**	31.	Upper	1.92	3.70**	56.	Upper	3.59	5.38**
	Lower	2.03			Lower	2.55			Lower	4.29	

No.		Value	t-value	No.		Value	t-value	No.		Value	t-value
7.	Upper	3.40	1.17(NS)	32.	Upper	1.37	0.84(NS)	57.	Upper	3.51	8.66**
	Lower	4.03			Lower	1.47			Lower	4.55	
8.	Upper	3.70	2.70**	33.	Upper	2.81	3.47**	58.	Upper	3.48	3.92**
	Lower	4.44			Lower	3.40			Lower	4.03	
9.	Upper	2.88	4.90**	34.	Upper	2.88	2.95**	59.	Upper	1.74	0.41(NS)
	Lower	3.55			Lower	3.59			Lower	1.89	
10.	Upper	3.11	3.52**	35.	Upper	1.55	0.78(NS)	60.	Upper	2.11	1.63(NS)
	Lower	3.70			Lower	1.74			Lower	2.29	
11.	Upper	3.62	3.68**	36.	Upper	1.85	1.57(NS)	61.	Upper	2.07	4.04**
	Lower	3.07			Lower	2.07			Lower	2.96	
12.	Upper	2.96	2.39*	37.	Upper	2.74	3.50**	62.	Upper	2.92	4.82**
	Lower	3.77			Lower	3.44			Lower	3.74	
13.	Upper	1.55	4.05**	38.	Upper	2.37	5.00**	63.	Upper	2.66	3.08**
	Lower	1.59			Lower	3.07			Lower	3.40	
14.	Upper	3.55	0.04(NS)	39.	Upper	2.90	2.75**	64.	Upper	3.03	4.45**
	Lower	4.03			Lower	3.51			Lower	3.92	
15.	Upper	3.44	2.08*	40.	Upper	2.14	0.40(NS)	65.	Upper	2.12	1.36(NS)
	Lower	3.92			Lower	2.22			Lower	2.27	
16.	Upper	2.85	2.82**	41.	Upper	2.03	1.10(NS)	66.	Upper	2.62	5.38**
	Lower	3.48			Lower	2.25			Lower	3.37	
17.	Upper	1.62	3.15**	42.	Upper	2.92	4.35**	67.	Upper	2.51	3.04**
	Lower	1.77			Lower	3.66			Lower	3.18	
18.	Upper	2.44	0.81(NS)	43.	Upper	3.40	1.15(NS)	68.	Upper	2.81	5.38**
	Lower	3.03			Lower	3.55			Lower	3.51	
19.	Upper	2.12	2.95**	44.	Upper	3.74	5.38**	69.	Upper	2.88	4.28**
	Lower	2.29			Lower	4.44			Lower	3.48	
20.	Upper	2.12	1.37(NS)	45.	Upper	2.96	3.88**	70.	Upper	3.07	5.15**
	Lower	2.29			Lower	3.62			Lower	3.74	
21.	Upper	2.70	3.04**	46.	Upper	1.62	0.66(NS)	71.	Upper	3.22	3.70**
	Lower	3.33			Lower	1.70			Lower	3.85	
22.	Upper	3.03	3.94**	47.	Upper	3.44	3.18**	72.	Upper	2.88	6.61**
	Lower	3.70			Lower	4.14			Lower	3.74	
23.	Upper	1.77	1.21(NS)	48.	Upper	1.29	2.14*	73.	Upper	2.11	1.82(NS)
	Lower	2.07			Lower	1.50			Lower	2.29	
24.	Upper	2.55	2.44*	49.	Upper	3.40	5.25**	74.	Upper	3.07	4.78**
	Lower	3.07			Lower	4.03			Lower	3.74	
25.	Upper	2.92	2.52*	50.	Upper	2.25	0.85(NS)	75.	Upper	3.51	4.50**
	Lower	3.40			Lower	2.37			Lower	4.14	

***Significant at 0.01 level*   ** Significant at 0.05 level*   *NS = Not Significant*

Final Draft of the Scale

After rejecting 19 items, 56 items were retained for the final form of the observation scale. Dimension-wise distribution of items are presented in the table 4:

Table-4 Dimensions of Teaching Effectiveness Observation Scale along with their Item Number

Serial No.	Dimensions of TEOS	Item Numbers	Total Items
I.	Planning of the Lesson	1-5	5
II.	Execution	6-32	27
III.	Classroom Management	33-40	8
IV.	Professional &Personal Competence of Teachers	41-52	12
V.	Closing the Lesson	53-56	4
		Total	**56**

Administration of the Scale

Since, it is an observation scale a detailed guideline is provided for the investigators for the administration of scale. Unlike self-administrating scales, to administer this scale an

investigator has to observe a teacher by himself/herself. Planning for observation (Permission from the principal of school to be visited) should be done beforehand. Pre-observation meeting should be conducted to explain the concerned subjects about the observation procedure. Investigator should take a seat at the back of the class and keeps the observation sheet ready. A mark should be placed with respect to the teaching activity. Duration of the lecture will be considered as the time limit and all columns should be filled.

Scoring Procedure
This scale consists five responses i.e., most effective, more effective, effective, less effective and least effective.

Table-5 Scoring Procedure

Alternative Responses	Most Effective	More Effective	Effective	Less Effective	Least Effective
Score	5	4	3	2	1

Standardization of the Scale
The final draft of the scale with 56 items was administered on the randomly selected sample of 100 teachers of secondary and senior school teachers located in Haryana State.
Reliability
The reliability of Teaching Effectiveness Observation Scale was established on the basis of (1) Test-Retest Reliability (2) Split-Half Reliability and (3) Internal Consistency Method.
Test-Retest Reliability- For the Test-Retest Reliability, a sample of 100 teachers was again observed after an interval of 15 days. The coefficient of correlation was noted to be 0.727 which was significant at 0.01 level.
Split-Half Reliability- The reliability of Teaching Effectiveness Observation Scale was determined by using 'Split-Half Method'. For this, the items of the scale were divided in two parts by following the odd-even method. After applying Spearman-Brown Prophecy formula, the reliability coefficient (r) of Split-Half come out to be 0.970 which was significant at 0.01 level.

Table-6 Correlation Coefficients showing Internal Consistency of TEOS

Sr. No.	Dimensions	'r' values
I.	Planning of the Lesson	0.403**
II.	Execution	0.936**
III.	Classroom Management	0.715**
IV.	Professional & Personal Competence of Teachers	0.854**
V.	Closing the Lesson	0.528**

**Significant at 0.01 level

Internal Consistency - The internal consistency of the scale was ascertained by computing the coefficients of correlation between the total score on the scale and score of each of the five dimensions of the scale. The values of correlation coefficients are given in Table 6.

Validity
The validity of the scale was calculated on the basis of face validity and construct validity. For face validity, the items were given to the 20 experts belonging to the field of Education, Psychology, Sociology and Language to judge the relevancy of items. The unanimity of experts about the items was taken as an indicator of face validity of the scale. The construct

validity of the scale was calculated by computing the inter-correlations among different dimensions of Teaching Effectiveness. The coefficients of correlation were found to be significant at 0.01 level as shown in Table 7.

Table-7 Inter –Correlations among the Dimensions of TEOS (N=100)

Dimensions	Planning of the Lesson	Execution	Classroom Management	Professional & Personal Competence of Teachers	Closing the Lesson
Planning of the Lesson	-	-	-	-	-
Execution	0.432**	-	-	-	-
Classroom Management	0.353**	0.647**	-	-	
Professional & Personal Competence of Teacher	0.452**	0.688**	0.507**	-	-
Closing the Lesson	0.381**	0.342**	0.383**	0.556**	-

**Significant at the 0.01 level

Statistical Results
Dimension-wise & for full scale, the statistical results have been given in Table 8.
Norms
Corresponding to the obtained raw scores, z-Score norms have been prepared and presented in Table 9. The norms for the interpretation of z-Scores and the range of raw scores to measure the level of teaching effectiveness have been given in Table 10.

Table-8 Dimension-wise &Full-Scale Statistical Results (N= 100)

SN	Dimensions of Teaching Effectiveness Observation Scale	Mean	SD
I.	Planning of the lesson	17.42	1.93
II.	Execution	89.23	8.95
III.	Classroom Management	28.84	3.57
IV.	Professional & Personal Competence of Teachers	39.58	4.63
V.	Closing the Lesson	13.93	2.68
	Total	189.00	21.76

Table-9 z-Score Norms for Teaching Effectiveness Observation Scale

Mean: 189.00   **SD: 21.76**   **N: 100**

Raw Score	z-Score	Raw Score	z-Score	Raw Score	z-Score
141	-2.20	**174**	-0.68	**207**	0.82
142	-2.15	**175**	-0.64	**208**	0.87
143	-2.11	**176**	-0.59	**209**	0.91
144	-2.06	**177**	-0.55	**210**	0.96
145	-2.02	**178**	-0.50	**211**	1.01
146	-1.97	**179**	-0.45	**212**	1.05
147	-1.93	**180**	-0.41	**213**	1.10
148	-1.88	**181**	-0.36	**214**	1.14

149	-1.83	**182**	-0.32	**215**	1.19
150	-1.79	**183**	-0.27	**216**	1.24
151	-1.74	**184**	-0.22	**217**	1.28
152	-1.70	**185**	-0.18	**218**	1.33
153	-1.65	**186**	-0.13	**219**	1.37
154	-1.60	**187**	-0.09	**220**	1.42
155	-1.56	**188**	-0.04	**221**	1.47
156	-1.51	**189**	0.00	**222**	1.51
157	-1.47	**190**	0.04	**223**	1.56
158	-1.42	**191**	0.09	**224**	1.60
159	-1.37	**192**	0.13	**225**	1.65
160	-1.33	**193**	0.18	**226**	1.70
161	-1.28	**194**	0.22	**227**	1.74
162	-1.24	**195**	0.27	**228**	1.79
163	-1.19	**196**	0.32	**229**	1.83
164	-1.14	**197**	0.36	**230**	1.88
165	-1.10	**198**	0.41	**231**	1.93
166	-1.05	**199**	0.45	**232**	1.97
167	-1.01	**200**	0.50	**233**	2.02
168	-0.96	**201**	0.55	**234**	2.06
169	-0.91	**202**	0.59	**235**	2.11
170	-0.87	**203**	0.64	**236**	2.15
171	-0.82	**204**	0.68	**237**	2.20
172	-0.78	**205**	0.73		
173	-0.73	**206**	0.78		

Table-10 Norms for Interpretation of the Level of Teaching Effectiveness Observation Scale

Sr. No.	Range of Raw Scores	Range of z-Scores	Grade	Levels of Teaching Effectiveness
1.	237 & above	2.20 & above	A	**Most Effective**
2.	222-236	1.51 to 2.15	B	**More Effective**
3.	157-221	-1.47 to 1.47	C	**Effective**
4.	142-156	-2.15 to -1.51	D	**Less Effective**
5.	141 & below	-2.20 & below	E	**Least effective**

CONCLUSION

The growth of any nation entirely depends on its education system. The education system consists of the teacher, student and the administration. Among these determinants, a teacher is the focal point around which the growth of an educational institution revolves. Hence, the quality of teaching (teaching effectiveness) is crucial and should be checked from time to time so that they can achieve the objectives of an educational institution. This paper sheds light on the need to construct the teaching effectiveness observation scale. This scale will help the researchers to observe and measure the teaching effectiveness of school teachers. The paper will also guide the aspiring researcher to construct a new scale by following the steps provided above.

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