DEVELOPMENT AND VALIDATION OF TECHNO-PEDAGOGICAL COMPETENCY SCALE FOR TEACHERS

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ABSTRACT

The present study is an attempt to construct and validate a tool for assessing the Teacher's techno-pedagogical competencies. A pilot study among one hundred teachers including fifty male and fifty female teachers from various schools was conducted inNamakkal District to establish reliability and validity of the tool. The Mean, Median and S.D value of the tool are 197.67, 198.59 and 6.71 respectively. The distribution seems to be slightly positively skewed. Content validity was established by getting opinions of the experts and scholars in the field of education. Percentile norms of the tool was also planned well to apprise the scores of Teacher'stechno-pedagogical competency. The tool contains forty items including thirty five positive items and five negative items. The minimum score of the scale is forty and maximum score is two hundred.

Keywords: *Techno-pedagogy, Techno-pedagogical competency– teachers – development of tool.*

Introduction

Pedagogy can be defined asthe art or science of teaching; especially instruction in teaching methods.Beyond simply understanding the content in teaching, pedagogy involves being able to convey knowledge and skills in ways that students can understand, remember and apply. Although there is a significant amount of overlap between the two, pedagogical skills can generally be divided into 1. Classroom management skills2.Content-related skills. The recent developments in the technology made significant changes in pedagogy which in turn opens a new area called Techno-pedagogy. The ability of teachers to apply and adopt technology effectively in teaching and learning process is known as Techno-pedagogical competency. It is indispensable to measure the Techno-pedagogical competency among the teachers in order to ensure the competency level. Hence, an attempt has been made to develop a tool to measure the Techno-pedagogical competency for teachers.

Concept of Techno-Pedagogic Competency

Techno-pedagogy is defined as "electronically mediated courses that integrate sound pedagogic principles of teaching/learning with the use of technology" (Connars 2009).Teacher's first major task is to learn how to manage students in their classroom. Competency refers to the cluster of related abilities, commitments, knowledge, and skills that enable a person (or an organization) to act effectively in a job Competence indicates sufficiency of knowledge and skills that enable or situation. Techno pedagogic

Competency is the ability in the effective use of teaching content with the help of technology. Because each level of responsibility has its own requirements, competence can occur in any period of a person's life or at any stage of his or her career. This set of pedagogical skills involves establishing clear rules and expectations, because students who do not know what is expected of them are more likely to misbehave. Establishing expectations upfront, keeps many problems from arising. When behavioral problems do arise in the classroom, however, a skilled teacher is able to handle them with a minimum amount of disruption to the learning environment. Various dimensions of Techno Pedagogic Competency includes Using Technology in Teaching, Using Technology in Providing Learning Experiences, Using Technology in Presentation and Using Technology in Preparation (Glenn 2002).

The other major area of pedagogical skills is that of teaching the content effectively. These skills vary with the subject matter and level of instruction, as those skills needed to teach kindergarteners to read are (significantly different) from those needed to teach secondary students. Regardless of the content, however, a good teacher will present information in ways that (actively engage) the students in the material that they are learning. Good pedagogy involves not only imparting information, but also providing opportunities to apply that information (Cher& Ching 2008).

Development of the Scale

The items of Teacher's Techno-Pedagogical Competency Scale (TTPCS) have been selected on the basis of four dimensions that include 1. Using Technology in Teaching, 2. Using Technology in Providing Learning Experiences, 3. Using Technology in Presentation, 4.Using Technology in Preparation. For the selection of items, a number of standard inventories, questionnaires and books have been referred. . The steps involved in the development of Virtual Learning Environment Scale (VLES) by Saisandhiya.S and Sivakumar,P were carefully considered for developing the present scale.The opinion of the experts was also sought out for the selection of items. Finally, items were modified and framed which were found suitable for assessing theTechno-Pedagogical competency ofteachers. The present tool is developedbased on the tool designed by Sathyaraj and Rajasekar (2013). The scale consisted of forty items. The investigator based on opinion of the experts modified some of the items and brought out the tool with the same fortyitems. The items were developed in a simple language so that the sample teachers can understand and grasp themeaning of the statements easily. Statements of the scale are arranged randomly.

Respondents were asked to rate the statements as per their own perception towards their Techno-pedagogical competency on a five point scale. After reading each statement they were asked to indicate one among five alternatives namely, (always, sometimes, uncertain, rarely and never).Each dimension yields a score found by sum up of the score of the rating on each item of the related dimension.

Tryout ofTTPCS

The preliminary study of the Teacher'sTechno-Pedagogical competency Scale (TTPCS) was conducted to a randomly selected one hundred teachers including fifty digital natives (Teachers who use digital technology in the class room) and fifty digital immigrant (Teachers who were born before the wide spread adoption of digital technology) of ten high / higher secondary schools of Namakkal District in the state of Tamilnadu.

Administration of TTPCS Scale

The tools were distributed to one hundred teachers working in high/higher secondary high schools in Namakkal District. They were asked to fill up the details of gender, locality, age, educational qualification, professional qualification, designation etc. printed on the front page. Theteachers were requested to read the instructions carefully before giving their responses, realizing its importance in academic area. After the samples read out instructions, their suggestions and doubts were discussed and certain statements were rephrased with more clarity in understanding. The teachers were then requested to turn the page and to begin answering the items. No time limit was imposed, ordinarily not more than fifteen to twenty minutes were required for all the teachers to complete the tool.

Scoring Procedure

The statements in the scale were set against at a five point scale viz., Always, Sometimes, Uncertain, Rarely, and Never. The scale consists of thirty positive items and fivenegative items. The scores for positive statements were 1, 2, 3, 4, and 5 respectively and for negative statements were vice versa. The sum of scores shows the degree of Techno pedagogic competency of teachers. The maximum score of the scale was two hundred and the minimum wasforty.

Results

Thecalculated Mean, Median and S.D. values are furnished in Table 1

Table 1

Mean, Median and S.D values

Mean	Median	S.D
197.67	198.59	6.71

From Table-No.1 it is found thatthe value of mean and median is very near to each other and hence it is concluded that the distribution of data is perfectly normal.

Skewness,Kurtosis and S.E are also calculated and are presented in the Table.2.

Table 2

Skewness , Kurtosis and S.E (N=100)

	Value	S.E	Remarks
Skewness	0.82	.175	NS
Kurtosis	.213	.058	NS

Since the S. E. of skewness and kurtosis are less than ±1.96, at 5 % level of confidence, it is interpreted that the sample doesnot differ from normality.

Reliability and Validity of the TTPCS

For estimation the reliability of the Teacher'sTechno-Pedagogical Competency Scale (TTPCS), the test was administered on the 100 subjects in each category, twice with interval of twenty five days and the coefficient of correlation was computed between the 1st set of scores and second sets of scores. Reliability refers to the consistency with which a test measures. The concept of reliability suggests both stability and consistency of measurement. The reliability of TTPCS scale is found to be 0.85 and validity of the scale is found to be 0.92.

Percentile Norm for the Teacher's Techno-Pedagogical Competency Scale

The investigator of the present study framed the percentile norms in respect of the entire sample and the sub-samples for Teacher's Techno-Pedagogical Competency Scale (TTPCS) as below:

Table -3

Showing the norm forTeacher's Techno-Pedagogical Competency Scale

PERCENTILE	SCORE	TECHNO-PEDAGOGICAL COMPETENCYCATEGORIES
90 80	180 160	VERY GOOD
75 70	150 140	GOOD
60	120	AVERAGE

50 40	100 80	
30 25	60 50	POOR
20 10	40 20	VERY POOR

Techno-Pedagogical Competency Scale

Directions: Below is a list of statements and there are five alternatives against each statement, representing the five ways in which one can respond to these statements. Every response is correct, so kindly express your responses objectively

S. No	STATEMENTS	Alwa	Sometimes	Uncertain	Rarely	Never
	USING TECHNOLOGY IN TEACHING					
1.	**I prepare my lecture with the help of Microsoft word and power point presentation.**					
2.	**Teaching and learning materials have been stored in my pen drive and CDs for future reference.**					
3.	**I use macro media flash software for creating animations in my subject during presentation.**					
4.	**PowerPoint templates have been used by me to prepare slides instantly during teaching.**					
5.	**Rare sounds and famous speeches have been used by me during lecture with the help of a web**					

	source					
6.	Scanner are used to scan important printed documents and manuscripts useful for teaching.					
7.	I never use video clippings in teaching to catch the attention of the students due to the lack of time					
8.	I encourage the participation of the students in my lecture with the help of video games.					
9.	Digital Library has been used by me to prepare flash cards in teaching.					
10.	A computer and an LCD projector are not very much essential to make use of a smart board in teaching.					
11.	Smart board can be used as an alternative to a black board in teaching.					
	USING TECHNOLOGY IN PROVIDING LEARNING EXPERIENCES					
12.	I develop interest among the students by providing latest information and important circulars with the help of digital display boards.					
13.	I provide individual attention to the students with the help of smart board.					
14.	"Word art" option in MS-word software can be used by the teacher to grab the attention of the					

	students towards the subject.					
15.	**I prefer to give important instructions and assignments to the students with the help of websites.**					
16.	**I provide contrived learning experience to the students through multimedia images.**					
17.	**The definitions and the abstract concepts are well explained to the students with the help of Wikipedia.**					
18.	**I use spell check while correcting the assignments submitted by the students using web dictionary or oxford.**					
19.	**Laser printer has been used by me to prepare the content on a transparency sheet for overhead projector.**					
20.	**You-tube utility is used for the revision of previous years question papers.**					
	USING TECHNOLOGY IN PRESENTATION					
21.	**Internet has been used by me wherever necessary, in teaching and learning with the help of latest 4G/5G connectivity.**					
22.	**Presentation mode can be activated in power point presentation in teaching by pressing the functional key 'F5'.**					
23.	**Many e-book readers are used by me to read audio books in teaching.**					

24.	Web applications and television live programmes can simultaneously be utilized in teaching with the help of a smart TV.					
25.	Blue ray player is used by me in the class room to play High Definition pictures.					
26.	I'm unable to organise e-forums to carryout discussions globally.					
27.	I use latest web e-dictionary to teach the correct pronunciation to the students.					
28.	I insist students how to use a headset for listening purpose in specific chapters.					
29.	I use educational audio lessons and poems for my teaching.					
30.	I stress on the importance of listening online discussions.					
31.	I don't know how to store collected materials in floppies, CDs and Pen drives					
	USING TECHNOLOGY IN PREPARATION					
32.	I don't have necessary skill to use technological resources effectively for preparing lesson plans.					
33.	I watch T.V. lessons, resources by Swayan Prabha, NPTEL, NCERT before beginning my lesson plan preparation					

34.	**As a part of preparation, I make use of video lesson also.**					
35.	**I visit digital libraries for preparing lesson plan.**					
36.	**I refer to e-library books for preparing lesson plans.**					
37.	**I use cassettes of animation relevant to the topic of teaching.**					
38.	**After consulting with IT Professors, I download relevant materials related to the topic to be taught and use them in class.**					
39.	**I update myself with the latest lecturers by eminent scholars and by attending subject oriented conferences.**					
40.	**I take pictures using digital video camera in class.**					

Conclusion

Thus, the Teacher's Techno-Pedagogical Competency Scale (TTPCS)under four dimensions viz.,1. Using Technology in Teaching, 2. Using Technology in Providing Learning Experiences, 3. Using Technology in Presentation 4. Using Technology in Preparation has been developed based on the tool designed by Sathyaraj and Rajasekar (2013).The scale consists of 40 items. The investigator based on the opinion of the experts modified some of the items and brought out the tool with the same 40 items. The items were developed in a simple language so that the sample teachers can understand and grasp the meaning of the statements easily. The validity and reliability are also established and the percentile norms in respect of the entire sample and the sub-samples are furnished.

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