TECHNO PEDAGOGICAL SKILL AMONG SCHOOL TEACHERS AT SECONDARY LEVEL IN CHENNAI DISTRICT

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Abstract
This study investigates the techno-pedagogical skills of secondary school teachers in Chennai District, focusing on their ability to integrate technology into teaching practices. Using a normative survey method, data were collected from 300 teachers using the Techno-Pedagogical Skill Assessment Scale developed by Sibichen and Annaraja (2009). The study assessed seven dimensions of techno-pedagogical skills: learning, preparing lesson plans, preparing learning materials, implementing instructional strategies, communication, evaluation, and guidance. Results revealed that only 16.7% of teachers exhibited a high level of overall techno-pedagogical skills, with significant disparities between urban and rural teachers, as well as between Tamil and English medium teachers. Male teachers outperformed female teachers in guidance, while urban and English medium teachers demonstrated superior skills in multiple dimensions compared to their rural and Tamil medium counterparts. The study highlights the need for targeted professional development programs, particularly for rural and female teachers, to enhance their techno-pedagogical competencies. Recommendations include integrating educational technology into teacher training programs, conducting workshops, and promoting digital lesson planning to bridge the existing skill gaps.
Keywords: *Techno Pedagogical Skill, Technology Integration & Secondary School Teachers.*

Introduction

Techno-pedagogy refers to the integration of technology into teaching for effective and developed pedagogical reasons. It involves essential technological/professional competence, technology practice competences for personal development and knowledge acquisition, planning and preparing topic/lesson plans, and delivering lessons. Competence is required to determine the advantages and disadvantages of technologies for learning, integrate technologies appropriately, handle application and basic tools and solve technical problems. Competence is also needed to update knowledge about technology for curriculum attainment and provide digital and interactive technologies harmony with the nature of the topic/subject. Techno-pedagogy in education leads to desirable changes,

improves the quality of education, and is essential for teacher education, as teachers mold students and input in the education process.

Significance of the Study

Techno-pedagogy is a significant deciding aspect for the mixture approach of reflective teaching. The last two decennials have witnessed the inclusion of progresses in techno-pedagogical skills in higher education organizations around the world. Use of techno-pedagogical skills can break down some of the barriers that lead to underachievement, student disillusionment and educational barring. Every student teacher must know how to utilize technology, pedagogy and subject area content effectively in their classroom teaching. It is clear that merely presenting technology to the educational process is not sufficient. One must ensure technological integration meanwhile technology by itself will not lead to change. Rather, it is the way in which school teachers integrate technology that has the potential to bring change in the education system.

The value of technology in teaching and learning has been a subject of some contention in the education community for some time. Teachers' use of technologies has an important role in education in the 21st century. Technology can provide powerful environments eliciting modern views of learning but may not change teachers' beliefs and practice. It depends on how teachers interpret the uses of tools and how they use them to transform the learning processes (Riel, 1998). The advent of internet-based technology in the classroom acts as an impetus for the re-conceptualization of learning; the idea that ICT has the potential to transform teaching and learning is broadly held (UNESCO, 2002). Preparing future teachers who know how to integrate effective use of ICT in their curriculum remains a challenging goal for teacher preparation programmes. In order to increase the technology proficiency of new teachers in classrooms, training institutions should increase the level of technology integration in their own academic programmes. Technologies seem to help school teachers overcome a great array of teaching challenges or difficulties encountered during their teaching. The greatest advantage of using technologies appears to be the variety of activities that can be undertaken in the classrooms. Technology appears to help school teachers diversify both their teaching strategies and the activities they expect learners to accomplish. Being a student teacher this thought directs this researcher towards analyzing the techno-pedagogical skills among secondary school teachers in Chennai District.

Review of Related Studies

Kumar, S., & Sharma, R. (2022) conducted a study on Techno-Pedagogical Skills of Secondary School Teachers: A Study in the Digital Era.This study explores the techno-pedagogical skills of secondary school teachers in the context of the digital era. With the increasing integration of technology in education, teachers are expected to possess the skills to effectively use digital tools in their teaching practices. The study employed a mixed-

methods approach, collecting data from 200 secondary school teachers in urban and rural areas. Findings revealed that while teachers had a moderate level of techno-pedagogical skills, there were significant gaps in their ability to integrate technology into lesson planning and assessment. The study highlights the need for targeted professional development programs to enhance teachers' digital competencies and align them with the demands of 21st-century education.

Rajesh, M., & Priya, V. (2023) made a study on Impact of Techno-Pedagogical Skills on Student Engagement: A Case Study of Secondary Schools. This research investigates the impact of teachers' techno-pedagogical skills on student engagement in secondary schools. The study was conducted in Chennai District, involving 150 teachers and 500 students. Data were collected through surveys, classroom observations, and interviews. Results indicated that teachers with higher techno-pedagogical skills were more effective in engaging students through interactive and technology-enhanced lessons. However, challenges such as inadequate infrastructure and lack of training were identified as barriers to effective technology integration. The study concludes with recommendations for policy interventions and teacher training programs to foster techno-pedagogical competencies.

Anand, P., & Lakshmi, S. (2023) researched a Digital Literacy and Techno-Pedagogical Skills Among Secondary School Teachers: A Comparative Study. This comparative study examines the digital literacy and techno-pedagogical skills of secondary school teachers in urban and rural areas of Chennai District. A sample of 300 teachers participated in the study, which used a structured questionnaire to assess their skills in using digital tools for teaching and learning. The findings revealed significant disparities between urban and rural teachers, with urban teachers demonstrating higher levels of digital literacy and techno-pedagogical competence. The study emphasizes the need for equitable access to technology and training to bridge the digital divide and enhance teaching practices across all regions.

Objectives of the Study

- To find out the Level of Techno-Pedagogical Skills of school teachers.
- To find out the significant difference between Male and Female school teachers in their Techno-Pedagogical Skills
- To find out the significant difference between Rural and Urbanschool teachers in their Techno-Pedagogical Skills
- To find out the significant difference between Tamil and English mediumschool teachers in their Techno-Pedagogical Skills

Hypotheses of the Study

1. There is no Significant difference between Male and Female school teachers in their Techno-Pedagogical Skills

2. There is no Significant difference between Rural and Urbanschool teachers in their Techno-Pedagogical Skills
3. There is no Significant difference between Tamil and English mediumschool teachers in their Techno-Pedagogical Skills

Limitations of the Study

The investigator has given the limitation of the study are as follows,

1. The present study is limited to only ten secondary school teachers at Chennai district.
2. The population is restricted to only secondary school teachers in Chennai district.
3. The variables selected for the study are techno pedagogical skills only.
4. Sample for the study is limited to only 300 school teachers.
5. The investigator has used the questionnaire method.

Method for the Present Study

Normative Survey method was used for this study since this method to collect data from a relatively large number of cases at a particular time.

Tool used in the Study

The investigator has adopted the techno-pedagogical skill assessment scale developed and validated by Sibichen and Annaraja (2009).

Table 1 Item Distribution of Techno-Pedagogical Skill Assessment Scale

Sl. No	Dimensions of Techno-Pedagogical Skills	Assessing Items
1	Learning	1-7
2	Preparing lesson plan	8-14
3	Preparing learning material	15-21
4	Implementing instructional strategy	22-28
5	Communication	29-35
6	Evaluation	36-42
7	Guidance	43-49

Reliability

The responses were scored from 50 teachers and the co-efficient of correlation between the two sets of scores was calculated. The reliability co-efficient was found to be 0.82. Thus the reliability of the tool has been established by test-retest method.

Validity

The tool was given to the experts in the field of education and technology. Based on their suggestions and feedback some of the modifications were made in the tool. Thus face validity was done.

Scoring Procedure

The tool is designed and crafted in such a way that there is no right or wrong answer per score. The negative statements were avoided. For getting the scores, each answered item was checked using the following criteria.

Table 2 Scoring of the Techno-Pedagogical Skill Assessment Scale

Sl. No.	Responses	Scores
1	Strongly Disagree	1
2	Disagree	2
3	Indifferent	3
4	Agree	4
5	Strongly Agree	5

Population and Sample of the Study

The population of the present study consists of school teachers those who are working in high and higher secondary schools in Chennai district, Tamil Nadu. The investigator has used simple random sampling technique for selecting the sample from the population. The sample consists of 300 school teachers. Among them 150 were male and 150 were female school teachers.

Sample Technique of the Study

A sample is a small proportion of the population selected for observation and analysis. By observing the characteristics of the sample, one can make certain inferences about the characteristics of the population from which it is drawn. The investigator has used random sampling technique for selecting the sample and the investigator randomly selected 300 school teachers from 7 schools.

Statistical Techniques used

Arithmetic Mean, Standard Deviation and ‘t’ test were used.

Analysis

Level of Techno-Pedagogical Skills of school teachers

Table 3 Level of Techno-Pedagogical Skills of School Teachers

Dimensions	Low		Moderate		High	
	N	%	N	%	N	%
Learning	7	23.3	18	60.0	5	16.7
Preparing Lesson	2	6.7	23	76.7	5	16.7
Preparing learning material	5	16.7	19	63.3	6	20.0
Implementing instructional strategy	6	20.0	20	66.7	4	13.3
Communication	5	16.7	22	73.3	3	10.0
Evaluation	3	10.0	24	80.0	3	10.0
Guidance	3	10.0	22	73.3	5	16.7
Overall Techno Pedagogical Skill	5	16.7	20	66.7	5	16.7

The above table revealed that the level of techno pedagogical skill and its dimensions of school teachers. In this level 16.7% of school teachers have high level of leaning, 16.7% of school teachers have high level of preparing lesson, 20.0% of school teachers have high level of preparing learning material, 10.0% of school teachers have high level of implementing instructional strategy, 10.0% of school teachers have high level of communication, 10.0% of school teachers have high level of evaluation, 16.7% of school teachers have high level of guidance and 16.7% of school teachers have high level of overall techno pedagogical skill.

Hypothesis: 1

There is no Significant difference between Male and Female school teachers in their Techno-Pedagogical Skills

Table 4 Difference between Male and Female School Teachers in their Techno-Pedagogical Skills

Dimensions	Gender	N	Mean	S.D	Calculated 't' value	Remarks
Learning	Male	150	17.60	2.640	1.110	NS
	Female	150	18.87	3.543		
Preparing Lesson	Male	150	17.87	1.727	0.275	NS
	Female	150	17.53	4.373		
Preparing learning material	Male	150	17.73	2.987	0.993	NS
	Female	150	16.40	4.256		
Implementing instructional strategy	Male	150	17.73	2.604	0.573	NS
	Female	150	18.33	3.109		
Communication	Male	150	19.07	4.250	0.259	NS
	Female	150	19.47	4.224		
Evaluation	Male	150	18.80	2.883	0.935	NS
	Female	150	17.60	4.050		

Guidance	Male	150	18.33	1.799	1.969	S
	Female	150	16.53	3.091		
Overall Techno Pedagogical Skill	Male	150	127.13	12.305	0.383	NS
	Female	150	124.73	20.937		

(At 5% level of significance the table value of 't' is 1.96, S - Significant NS - Not Significant)

The above table reveals that there is a significant difference between male and female school teachers in their guidance. While comparing the mean scores male school teachers are better than the female school teachers. But there is no significant difference between male and female school teachers in their leaning, preparing lesson, preparing learning material, implementing instructional strategy, communication, evaluation and overall techno pedagogical skill. This may due to the fact that male school teachers find it easy to interact with students and identify the needy ones and make extra effort to associate with problem children and take it as a challenge over and above their counter parts.

Hypothesis: 2

There is no Significant difference between Rural and Urban school teachers in their Techno-Pedagogical Skills

Table 5 Difference between Rural and Urban School Teachers in their Techno-Pedagogical Skills

Dimensions	Location of Teachers	N	Mean	S.D	Calculated 't' value	Remarks
Learning	Rural	190	17.05	2.559	3.786	S
	Urban	110	21.00	2.646		
Preparing Lesson	Rural	190	16.71	2.552	2.405	S
	Urban	110	20.00	3.742		
Preparing learning material	Rural	190	15.86	3.291	3.262	S
	Urban	110	19.89	3.018		
Implementing instructional strategy	Rural	190	17.52	2.379	1.310	NS
	Urban	110	19.22	3.563		
Communication	Rural	190	18.48	4.203	1.791	NS
	Urban	110	21.11	3.655		
Evaluation	Rural	190	17.48	3.586	1.979	S
	Urban	110	19.89	2.804		
Guidance	Rural	190	17.14	2.594	0.886	NS
	Urban	110	18.11	2.804		
Overall Techno Pedagogical Skill	Rural	190	120.24	14.121	3.086	S
	Urban	110	139.22	15.975		

(At 5% level of significance the table value of 't' is 1.96, S - Significant NS - Not Significant)

The above table reveals that there is a significant difference between rural and urban school teachers in their leaning, preparing lesson, preparing learning material, evaluation and overall techno pedagogical skill. While comparing the mean scores urban school teachers are better than the rural school teachers. But there is no significant difference between rural and urban school teachers in their implementing instructional strategy, communication and guidance. This may due to the fact that urban students have more exposure to have a better relationship with technological resources and it will lead them to better learning and preparing learning material and evaluation and overall pedagogical skills.

Hypothesis: 3

There is no Significant difference between Tamil and English medium school teachers in their Techno-Pedagogical Skills

Table 6 Difference between Tamil and English Medium School Teachers in their Techno-Pedagogical Skills

Dimensions	Medium of Instruction	N	Mean	S.D	Calculated 't' value	Remarks
Learning	Tamil	210	17.33	2.373	2.188	S
	English	90	20.33	3.808		
Preparing Lesson	Tamil	210	16.62	2.439	2.682	S
	English	90	20.22	3.701		
Preparing learning material	Tamil	210	16.10	3.687	2.739	S
	English	90	19.33	2.598		
Implementing instructional strategy	Tamil	210	17.76	2.931	0.830	NS
	English	90	18.67	2.646		
Communication	Tamil	210	18.43	3.802	1.616	NS
	English	90	21.22	4.549		
Evaluation	Tamil	210	17.67	2.781	2.044	S
	English	90	19.44	4.773		
Guidance	Tamil	210	16.86	2.816	1.334	NS
	English	90	18.78	1.641		
Overall Techno Pedagogical Skill	Tamil	210	120.76	15.006	2.817	S
	English	90	138.00	15.508		

(At 5% level of significance the table value of 't' is 1.96, S - Significant NS - Not Significant)

The above table reveals that there is a significant difference between Tamil and English medium school teachers in their leaning, preparing lesson, preparing learning material, evaluation and overall techno pedagogical skill. While comparing the mean scores

English medium school teachers are better than the Tamil medium school teachers. But there is no significant difference between Tamil and English medium school teachers in their implementing instructional strategy, communication and guidance. This may due to the fact that English medium school teachers have more exposure to have a better relationship with technological resources and it will lead them to better learning and preparing learning material and evaluation and overall pedagogical skills.

Results and Discussion

- Table 3 reveals that the level of techno pedagogical skill and its dimensions of student teachers. In this level 16.7% of students teachers have high level of leaning, 16.7% of students teachers have high level of preparing lesson, 20.0% of students teachers have high level of preparing learning material, 10.0% of students teachers have high level of implementing instructional strategy, 10.0% of students teachers have high level of communication, 10.0% of students teachers have high level of evaluation, 16.7% of students teachers have high level of guidance and 16.7% of students teachers have high level of overall techno pedagogical skill.
- Table 4 reveals that there is a significant difference between male and female school teachers in their guidance. While comparing the mean scores male school teachers are better than the female school teachers. But there is no significant difference between male and female school teachers in their leaning, preparing lesson, preparing learning material, implementing instructional strategy, communication, evaluation and overall techno pedagogical skill.
- Table 5 reveals that there is a significant difference between rural and urban school teachers in their leaning, preparing lesson, preparing learning material, evaluation and overall techno pedagogical skill. While comparing the mean scores urban school teachers are better than the rural school teachers. But there is no significant difference between rural and urban school teachers in their implementing instructional strategy, communication and guidance
- Table 6 reveals that there is a significant difference between Tamil and English medium school teachers in their leaning, preparing lesson, preparing learning material, evaluation and overall techno pedagogical skill. While comparing the mean scores English medium school teachers are better than the Tamil medium school teachers. But there is no significant difference between Tamil and English medium school teachers in their implementing instructional strategy, communication and guidance

Recommendations

There are some recommendations based on the overall conclusions of the study which can be helpful for all school teachers.

1. Educational Technology (ET) and ICT in education should be offered as core courses at the teacher education programme, especially female student teacher.
2. Refresher courses, workshop should be conducted on educational technology and ICT to rural student teachers.
3. Digital lesson planning and implementation should be promoted in all the teacher education institutions, particularly rural and female student teachers.
4. Educating the students in college where workshops can be presented on ICT.
5. Workshops and orientations from ICT and experts should be presented in order to get a clear idea of the staff members.
6. Internet users are recommended to use strong and unique passwords for their social media websites.
7. Internet users are recommended to apply system updates in a timely and efficient manner.
8. Secure devices by enabling a firewall and deploy solutions to address viruses, malware and spyware.

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