Research Article

Techno-pedagogical Skills for the Emerging Secondary Teacher Education Students

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Abstract

This study has been undertaken with a view to find out the techno-pedagogical skills of secondary teacher education students. Survey method was adopted for the study. Results reveal that there is significant difference between graduate and post-graduate secondary teacher education students in their skills in implementing instructional strategy and guidance. Results also reveal that there is significant difference between secondary teacher education students who have attended computer course and who have not attended computer course in their skill in learning, evaluation and techno-pedagogical skills. The ANOVA test results reveal that there is significant difference among different optional subject secondary teacher education students in their techno-pedagogical skills. Physical science optional secondary teacher education students are better than English, Social science, Mathematics and Natural science optional secondary teacher education students in their skill in implementing instructional strategy. Thus the present study shows that how techno- pedagogical skills in the classroom redefine established teaching-learning styles. Thus techno- pedagogical skills of teacher trainees play a pivotal role in the acquisition of knowledge and competency.

Keywords: Techno-Pedagogical Skills, Secondary Teacher Education Students, Instructional Strategies, Computer Training, Graduate and Post-Graduate Differences, Learning and Evaluation Skills, Teacher Competency

INTRODUCTION

Teacher education involves professional preparation of teachers. The concept of teacher education is undergoing a rapid change throughout the world. It is no longer mere training as conceived earlier. It means the acquisition of that type of knowledge or information, skill and ability which helps a teacher to discharge his/her professional duties and responsibilities

effectively and efficiently. It means shaping and reshaping the attitudes, habits and personality of a teacher. As the educational scenario goes through a vast change in the newly emerging society, the teachers need to be well equipped with knowledge which would create curiosity in the students to learn new things (Dash, 2004).

Teacher education and teacher professional development are facing important quantitative and qualitative problems. It is estimated that 1535 million new teachers are needed to achieve UNESCO's goal of Education for All. Asian-Pacific region teacher education faces many challenges due to widespread changes in educational and curriculum reforms. Paradigms and approaches, derived from promising conceptual and technical tools and capable of renewing instruction and activity systems, are needed to prepare teachers for 21st-century teaching and learning. 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 technology has an important role in education in the 21st century. Technology_ can provide powerful environments eliciting modem yiews 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.

TECHNO-PEDAGOGY

Literally, 'pedagogy' refers to the art-science of teaching and 'techno' refers to the art-skill in handcrafting, derived from the Latin 'texere' (to weave or fabricate). Here, 'techno' is a qualifier; it intersects or crosses the meaning of 'pedagogy' with its own content. Techno-pedagogy refers to weaving the techniques of the craft of teaching into the learning environment itself. It requires conscious recognition of the mediated learning environment in order to maximize ease and clarity in the transmission of information.

SIGNIFICANCE OFTHE STUDY

The recent curriculum framework 2005 as proposed by NCERT (National Council of Educational Research and Training), India focuses on the issues of connecting knowledge to life outside shifting from rote learning to constructing knowledge providing a wide range of experiences for the overall development of a child. The recent developments in technology have changed the world outside the classroom. Educators and policymakers believe that information and communication technologies are of supreme importance to the future of education and, in tum, for the country at large. As ICT is becoming an integral element for

educational reforms and innovations at secondary schools, this situation calls for an enhancement of pre-service education on ICT for prospective teachers **(Cher & Ching 2008).**

Many teacher trainees know the content well but have not learned to transform or translate that knowledge into meaningful instruction. Although pre-service teachers do have a knowledge with regard to information and communication technologies (ICT) they have little know-how or techno-pedagogical ability with which to integrate those technologies into their teaching practice. Directly or indirectly teacher education programme will benefit from techno-pedagogical skills. Technological pedagogical content knowledge extends beyond proficiency with technology for personal l,lse to an understanding of how technology can be integrated with subject matter and the technology itself. In a 1995 study, the Office of Technology Assessment (OTA) found that teachers are reporting little use of technology and most teachers lack confidence to use technology effectively even though there is a greater availability of technologies in schools (Koehler, Mishra, & Yahya, 2004).

Teachers are expected to know to successfully integrate ICT into his/her subject areas to make learning more meaningful. This knowledge development during pre-service training has gained much importance with the notion that exposure to ICT during this time is helpful in increasing student teachers' willingness to integrate technology with classroom teaching. Pre-service teachers need to plan to use computers in their classrooms. Integrating technology in the classroom redefines established teacher-learner relationships and teaching-learning styles (Sibichen &Annaraja2010).

Effective technology use includes such activities as linking curriculum outcomes with various technologies, establishing a learning context of discovery and process in the use of technology, collaborating with others both face-to-face and virtually: to achieve learning outcomes, simulating real-world environments, and assessing outcomes. Teacher trainees can use technology to assist effectively and efficiently achieving curriculum objectives. Technology can provide powerful environments eliciting modem views of learning but may not change teachers' beliefs and practice. It depends on how teachers interpret the use of tools and how they use them to transform the learning processes.

STATEMENT OFTHEPROBLEM

Teacher trainees can use technology to assist effectively and efficiently achieving curriculum objectives. Technology can provide powerful environments eliciting modem views

of learning. It depends on how teachers interpret the uses of tools and how they use them to transform the learning processes. Further,-techno-pedagogical skills in teaching contribute a lot towards teaching competency. This is the rationale for studying the techno-pedagogical skills of secondary teacher education students.

TITLE

Techno-pedagogical skills for the emerging secondary teacher education students

OBJECTIVES

❖ To find out the level of skill in learning, preparing lesson plan, preparing learning material, implementing instructional strategy, communication, evaluation, guidance and techno-pedagogical skills of the secondary teacher education students.

❖ To find out whether there is any significant difference between male and female secondary teacher education students in their skill in learning, preparing lesson plan, preparing learning material, implementing instructional strategy, communication, evaluation, guidance and techno-pedagogical skills.

❖ To find out whether there is any significant difference between graduate and post-graduate secondary teacher education students in their skill in learning, preparing lesson plan, preparing learning material, implementing instructional strategy, communication, evaluation, guidance and techno-pedagogical skills.

❖ To find out whether there is any significant difference between secondary teacher education students who have attended computer course and who have not attended computer course in their skill in learning, preparing lesson plan, preparing learning material, implementing instructional strategy, communication, evaluation, guidance and techno-pedagogical skills.

❖ To find out whether there is any significant difference among English, Social science, Mathematics, Natural science and Physical science secondary teacher education students in their skill in learning, preparing lesson plan, preparing learning material, implementing instructional strategy, communication, evaluation, guidance and techno-pedagogical skills of the secondary teacher education students.

METHOD USED IN THE PRESENT STUDY

The method adopted in the present study is survey

SAMPLE

The investigator used stratified random sampling technique for selecting the sample. The sample of the study is secondary teacher education students studying in the B. Ed. colleges affiliated to Mahatma Gandhi University, Kottayam. The sample consists of75 secondary teacher education students, among them 37 are male students and 38 are female students.

TOOLUSED

Techno-Pedagogical Skill Assessment Scale developed by Sibichen and Dr. P. Annaraja (2009). The investigator used test-retest method for establishing reliability of the tool. The reliability co-efficient of the Assessment Scale was computed to be 0.79

STATISTICAL TECHNIQUES USED

Arithmetic mean, Standard Deviation, 't' test & ANOVA

DATAANALYSIS

TABLE 1.1

Level of techno-pedagogical skills of the secondary Teacher education students

Dimensions of Techno-pedagogical skills	Low		Moderate		High	
	No	**%**	**No**	**%**	**No**	**%**
Learning	15	20	47	62.7	13	17.3
Preparing lesson plan	13	17.3	49	65.3	13	17.3
Preparing learning material	15	20	49	65.3	11	14.7
Implementing instructional strategy	9	12	51	68	15.	20
Communication	17	22.7	44	58.7	14	18.7
Evaluation	16	21.3	49	65.3	10	13.3
Guidance	14	18.7	51	68	10	13.3
Techno-pedagogical skills	16	21.3	47	62.7	12	16

It is inferred from the Table 1.1 that 21.3% of the secondary teacher education students have low, 62.7% of them have moderate and 16% of them have high level of techno-pedagogical skills.

TABLE 1.2

Difference between male and female secondary teacher education Students in their techno-pedagogical skills

Dimensions of Techno-pedagogical skills	Male		Female		Calculated Value of 't'	Remarks at5% level
	Mean	SD	Mean	SD		
Learning	22.11	5.30	20.42	6.30	1.25	NS
Preparing lesson plan	18.54	4.61	17.95	5.43	0.50	NS
Preparing learning material	19.32	6.24	18	6.95	0.86	NS
Implementing instructional strategy	22.11	4.97	23.34	4.65	1.11	NS
Communication	19.95	5.31	20.45	5.93	0.38	NS
Evaluation	18.24	6.72	16.82	7.00	0.89	NS
Guidance	24.16	5.11	23.63	5.48	0.43	NS
Techno-pedagogical skills	144.43	28.23	140.61	29.68	0.57	NS

(At 5% level of significance the table value of "t" is 1.96)

It is inferred from the Table 1.2 that there is no significant difference between male and female secondary teacher education students in their skill in learning, preparing lesson plan, preparing learning material, implementing instructional strategy, communication, evaluation, guidance and techno-pedagogical skills.

TABLE 1.3

Difference between graduate and post-graduate secondary teacher education students in their techno-pedagogical skills

Dimensions of Techno-pedagogical skills	Graduate		Pos -graduate		Calculated Value of 't'	Remarks at5% level
	Mean	SD	Mean	SD		
Leaming	20.82	5.31	21.69	6.45	0.62	NS
Preparing lesson plan	18.47	4.96	18.13	5.07	0.29	NS
Preparing learning material	17.53	6.77	19.38	6.48	1.19	NS
Implementing instructional strategy	21.53	4.70	23.72	4.77	1.97	S
Communication	19.44	5.58	20.90	5.72	1.09	NS
Evaluation	17.18	6.07	17.97	7.66	0.48	NS
Guidance	22.24	4.49	25.67	5.37	2.93	S
Techno-pedagogical skills	137.21	27.89	147.46	29.83	1.51	NS

(At 5% level of significance the table value of "t" is 1.96)

It is inferred from the table 1.3 that there is no significant difference between graduate and post-graduate secondary teacher education students in their skill in learning, preparing lesson plan, preparing learning material, communication, evaluation and techno-pedagogical

skills. But there is significant difference between graduate and post-graduate secondary teacher education students in their skills in implementing instructional strategy and guidance.

TABLE 1.4

Difference between secondary teacher education students who have attended computer course and who have not attended computer course in their techno-pedagogical skills

Dimensions of Techno-pedagogical skills	Who have attended computer course		Who have not attended computer course		Calculated Value of 't'	Remarks at5% level
	Mean	SD	Mean	SD		
Learning	22.17	5.81	19.09	5.62	2.10	S
Preparing lesson plan	17.94	5.33	18.77	4.28	0.64	NS
Preparing learning material	18.96	6.90	17.77	6.03	0.70	NS
Implementing instructional strategy	22.77	5.91	2.77	4.23	0.03	NS
Communication	20.62	5.87	19.14	5.00	1.03	NS
Evaluation	18.52	7.37	15.23	5.07	1.90	S
Guidance	24.42	4.99	22.91	5.84	1.13	NS
Techno-pedagogical skills	145.40	30.78	135.68	23.67	1.32	S

(At 5% level of significance the table value of"t" is 1.96)

It is inferred from the Table 1.4 that there is no significant difference between secondary teacher education students who have attended computer course and who have not attended computer course in their skill in preparing lesson plan, preparing learning material, implementing instructional strategy, communication and guidance, but there is significant difference between secondary teacher education students who have attended computer course and who have not attended computer course in their skill in learning, evaluation and techno-pedagogical skills.

TABLE 1.5

Difference among different optional subject secondary teacher education students in their techno-pedagogical skills

Dimensions of Techno-pedagogical skills	Sources of Variation	Sum of Squares	Mean Square Variation	df	Calculated Value of 'F'	Remarks at 5% level
Learning	Below 50000	58.92	14.73	4	0.384	**NS**
	Above 50000	2453.62	38.33	64		
Preparing lesson plan	Below 50000	62.47	15.61	4	0.568	**NS**
	Above 50000	1758.40	27.47	64		
Preparing learning material	Below 50000	59.69	14.92	4	0.337	NS
	Above 50000	2832.85	44.26	64		
Implementing instructional strategy	Below 50000	307.145	76.78	4	3.78	**S**
	Above 50000	1300.01	20.31	64		
Communication	Below 50000	55.928	13.98	4	0.447	NS
	Above 50000	2000.36	3.25	64		
Evaluation	Below 50000	291.04	72.76	4	1.68	NS
	Above 50000	2761.82	43.15	64		
Guidance	Below 50000	139.08	34.77	4	1.19	**NS**
	Above 50000	1863.46	29.11	64		
Techno-pedagogical skills	Below 50000	2124.67	51.17	4	0.619	NS
	Above 50000	54915.52	858.05	64		

(At 5% level of significance the table value of "F" at 4, 64 df is 2.51)

It is inferred from the Table 1.5 that there is no significant difference among English, Social science, Mathematics, Natural science and Physical science secondary teacher education students in their skill in learning, preparing lesson plan, preparing learning material, communication, evaluation, guidance and techno-pedagogical skills. But there is significant difference among English, Social science, Mathematics, Natural science and Physical science secondary teacher education students in their skill in implementing instructional strategy.

TABLE 1.6

Association between Parents' Annual Income and Techno-pedagogical Skills of the Secondary Teacher Education Students.

Dimensions of Techno-pedagogical skills	Parents' Annual Income	Low		Moderate		High		Calculated Value of 'xz'	Remarks at5% level
		N	%	N	%	N	%		
Learning	Below 50000	9	60	35	79.5	6	50	4.94	NS
	Above 50000	6	40	9	20.5	6	50		
Preparing lesson plan	Below 50000	8	61.5	35	76.1	7	58.3	2.04	NS
	Above 50000	5	38.5	11	23.9	5	41.7		
Preparing learning material	Below 50000	11	73.3	32	71.1	7	63.6	0.314	NS
	Above 50000	4	26.7	13	28.9	4	36.4		
Implementing instructional strategy	Below 50000	6	66.7	35	71.4	9	69.2	0.04	NS
	Above 50000	3	33.3	14	28.6	4	30.8		
Communication	Below 50000	14	82.4	30	75.0	6	42.9	6.67	S
	Above 50000	3	17.6	10	2	8	57.1		
Evaluation	Below 50000	12	75	34	73.9	4	44.4	3.346	NS
	Above 50000	4	25	12	26.1	5	55.6		
Guidance	Below 50000	13	100	29	60.4	8	80	8.20	S
	Above 50000	0	0	19	39.6	2	20.0		
Techno-pedagogical skills	Below 50000	12	75	32	72.7	6	54.5	1.60	NS
	Above 50000	4	25	12	27.3	5	45.5		

(At 5% level of significance the table value of 'x^2' is 5.99)

It is inferred from the Table 1.6 that there is no significant association between parents' annual income and skill in learning, preparing lesson plan, preparing learning material, implementing instructional strategy and evaluation of the secondary teacher education students, but there is significant association between parents' annual income and skill in communication and guidance of the secondary teacher education students.

FINDINGS AND CONCLUSIONS

't' test results reveal that there is significant difference between graduate and post-graduate secondary teacher education students in their skills in implementing instructional strategy and guidance. While comparing the mean scores of graduate and post-graduate secondary teacher education students in their skills in implementing instructional strategy, post-graduate secondary teacher education students (mean23.72) are better than graduate secondary teacher education students(mean=21.53) in their skills in implementing

instructional strategy. This may be due to the fact that post-graduate students are more familiar with a variety of instructional strategies related to their discipline. While comparing the mean scores of graduate and post-graduate secondary teacher education students in their skills in guidance, post-graduate secondary teacher education students (mean=25.67) are better than graduate secondary teacher education students (mean=22.24) in their skills in guidance. This may be due the fact that post-graduate students have more experience and self-confidence compared to graduate secondary teacher education students.

't' test results reveal that there is significant difference between secondary teacher education students who have attended computer course and who have not attended computer course in their skill in learning, evaluation and techno-pedagogical skills.

While comparing the mean scores of secondary teacher education students who have attended computer course and who have not attended computer course in their skill in learning, secondary teacher education students who have attended computer course (mean=22. l 7) are better than those who have not attended computer course(mean=19.09) in their skill in learning. This may be due the fact that secondary teacher education students who have attended computer course fare well due to their acquaintance with ICT and which provides powerful environments for eliciting modem views of learning.

While comparing the mean scores of secondary teacher education students who have attended computer course and who have not attended computer course in their skill in evaluation, secondary teacher education students who have attended computer course (mean=l8.52) are better than those who have not attended computer course(mean=15.23) in their skill in evaluation. This may be due the fact that secondary teacher education students who have attended computer course have more access to acquire a variety of evaluation techniques which are available through internet.

't' test results reveal that there is significant difference between secondary teacher education students who have attended computer course and who have not attended computer course in their techno-pedagogical skills. While comparing the mean scores of secondary teacher education students who have attended computer course and who have not attended computer course in their techno- pedagogical skills, secondary. Teacher education students who have attended computer course (mean=145.40) are better than those who have not attended computer course(mean= 135.68) in their techno-pedagogical skills. This may be due the fact that exposure to computer course enables student teachers' to integrate technology with

classroom teaching. Moreover, they know how to use technology effectively and efficiently in classroom.

The ANOVA test results reveal that there is significant difference among different optional subject secondary teacher education students in their techno-pedagogical skills. Physical science optional secondary teacher education students·are better than English, Social science, Mathematics and Natural science optional secondary teacher education students in their skill in implementing instructional strategy. This may be due the fact that Physical science optional secondary teacher education students are better trained in Physical science discipline and are more likely adapt to different instructional strategies in their respective discipline.

Thus the present study shows that how techno-pedagogical skills in the classroom redefine established teaching-learning styles. Thus techno-pedagogical skills of teacher trainees play a pivotal role in the acquisition of knowledge and competency.

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