



TECHNO-PEDAGOGICAL COMPETENCIES OF TEACHER-EDUCATORS WITH REFERENCE TO THEIR STREAM

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Abstract: Information and Technology has grown up to apex level in the 21st Century especially after 2010. Thus, learning has become easier and interesting for the students. Learners are exploring learning materials through various mediums such as: internet, social media, learning platforms and many more. As per the changing needs of the learners, the teachers are to be trained and well-acquainted with the use of new technologies. TPACK stands for Technological Pedagogical Content Knowledge. It is a framework for the integration of Technological knowledge with the Pedagogical and Content knowledge of a teacher in order to impart effective knowledge to the students. This study is basically a descriptive survey conducted to find the level of Techno-Pedagogical Competence among the Teacher-Educators with reference to their streams of education. This study was delimited to the Teacher-Educators of Teacher-education institutions of Odisha only. The objective was to study the Techno-Pedagogical Competency of Teacher-Educators with reference to their stream. The Null Hypothesis formulated for the study stated that, there was no significant difference of mean scores of Techno-pedagogical competency of Teacher Educators with references to their stream. The investigator had selected Disproportionate Stratified Random Sampling Technique to acquire the samples out of the total population. The investigator had selected 50 Teacher-Educators particularly 28 from Arts and 22 from Science of different Teacher Education Institutes as sample. The data were collected through a self-made Techno-Pedagogical Competency Scale and sent to the Teacher-Educators of Teacher-Education Institutes of Odisha through Google form. The data were analyzed using t-test for comparing two sample mean scores between science and arts stream. The finding of the study revealed that, the calculated t value was 1.36 and the table t value was 2.01 where df was 48 and level of significance was 0.05. The finding of the study states, there was no significant difference between science and arts Teacher-Educators with reference to their Techno-Pedagogical competencies.

Index Terms – Technology, Pedagogy, Competency, ICT, Techno-Pedagogical Competency, Teacher-Educator.

I. INTRODUCTION

The 21st century is known as the era of Science and Technology. Technology is increasingly growing its importance in educational system. Through the use of technology the classrooms and learning have been changed; it has now been so interesting for a student than the traditional classroom setting. With the help of Technology, the learning environment gets more engaging, entertaining, interactive and worthy acquisition. Techno-Pedagogy this is the hybrid method of teaching in which information and computer technology is used for teaching learning situation. Techno- stands for Technology and Pedagogy- is the art and science of teaching. So, Techno-Pedagogy refers to the blend of Technology in Teaching in such a way that it perfectly suits learners' interest, abilities, demands and flexibility. Technology helps the learners in self-paced

learning and flexible learning both formally and informally. The teachers now-a-days are using digital technologies to enable the students with more personalized experiences at their preferred time.

As per the National Curriculum Framework (2005), “ICT if used for connecting children and teacher with scientist working in universities and research institutions would also help in demystifying scientist and their work.”

So, Techno-Pedagogical skill will provide an immense and meaningful knowledge of how best the learning takes place when a suitable technology is combined in a particular way in transacting instruction.

CONCEPT OF TPACK:

‘Technology’ refers to the use of anything or specifically modern tools through which everyday task become easier for us.

‘Pedagogy’ refers to ‘Science and Arts of teaching’.

‘Content’ refers to the subject of study. It may also be referred as the topics to be covered or taught.

ETYMOLOGICAL MEANING:

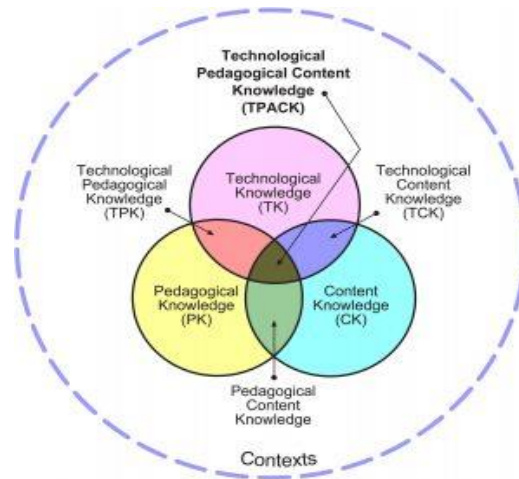
The word ‘Techno’ is derived from the Latin word ‘Texere’ which means ‘weave or construct’. Techno-Pedagogy refers to the construction of the techniques of teaching into the learning environment itself. Education Technology provides approximate designing learning situations, holding in view the objectives of the teaching and learning bring the best practices/means of instructions which effect on learning.

Thakur (2015), pp. 182-186 - Role of Techno-Pedagogy in making:

- Teaching effective
- Enhance linguistic abilities
- Develop teaching learning process
- Improve to develop study materials
- Design multi-grade instruction
- Plan specific pedagogy
- Support in Distance Education through e-learning
- Guide and Counsel for career choices
- Stimulate Self Learning ability
- Enhance enrolment and examination process
- Assist in research activities
- Reinforce for cognitive learning
- Development of life skills
- Develop aesthetic sensibility

M. H. Lee & C. C. Tsai, (2010) has described the techno-pedagogical skills very fluently these are described below:

- Skill to assess the potential and limits of technologies for learning.
- Skill to carry out a need analysis to introduce technologies in a Pedagogical sequence.
- Skill to handle basic tools and applications, and solve simple Technical problems.
- Skill to design appropriate tasks.
- Skill to design for intersections within and outside the classroom.
- Skill to invest new and interactive technologies congruence with the nature of the subject.
- Skill to manage time and optimize the integration of technologies.



Source: <https://educationaltechnology.net/technological-pedagogical-content-knowledge-tpack-framework/>

RATIONALE OF THE STUDY:

In the modern era, technology intervention has shown a spread in about every field including education. Teacher education is a vital part of the Indian Education system as it prepares future prospective teachers. Thus, from the training level, a teacher must be acquainted with the use of Technology in his/her classroom. In order to do so, Teacher-Educators must train the prospective teachers through the use of technology. Thus, Teacher-Educators must have enough competencies to teach the pupil-teachers through ICT (Information and Communication Technology). This study had focused on the study of Techno-Pedagogical competence of Teacher-Educators with reference to their stream of teaching which may be Arts or Science.

STATEMENT OF THE PROBLEM:

This study is intended to find out **“Techno-Pedagogical Competencies of Teacher-Educators with reference to their Stream.”**

OBJECTIVE OF THE STUDY

1. To study the Techno-pedagogical competencies of Teacher Educators with reference to their stream.

HYPOTHESES OF THE STUDY:

Based on the objective of this study the following null hypotheses are formulated:

H₀1: There is no significant difference in Techno-pedagogical competency mean scores of Teacher Educators with references to their stream of teaching.

DELIMITATIONS OF THE STUDY:

The present study is delimited to:

- i. Teacher-Educators of different Teacher Education Institutions of Odisha state only.
- ii. CTEs, IASEs and Self-financing B.Ed. Colleges of Odisha state only.
- iii. Competency in Techno-Pedagogy only.
- iv. Arts/Science Teacher Educators only.

II. RESEARCH METHODOLOGY

DESIGN OF THE STUDY:

This study employed descriptive survey design. It is a non-experimental descriptive research method which is one of the quantitative methods used for studying a large sample. In a survey research, the researcher collects data with the help of standardized questionnaires or interviews which is administered on a sample of respondents from a population. The method of survey research is one of the techniques of applied social research which can be helpful in collection of data both through direct and indirect observation.

The investigator conducted this study in online mode through the use of Google forms.

POPULATION OF THE STUDY:

The target population for this study was all the Teacher-Educators in the Teacher Education Institutions Odisha belonging to Arts and Science stream.

SAMPLING TECHNIQUE:

The investigator had selected Disproportionate Stratified Random Sampling Technique to acquire the samples out of the total population. Stratified Random sampling is a type of probability sampling technique where samples are first stratified into 2 categories and then from each stratum the required no. of samples are selected without any proportion.

SAMPLES OF THE STUDY:

The investigator had selected Disproportionate Stratified Random Sampling Technique to acquire the samples out of the total population. The investigator had selected 50 Teacher-Educators particularly 28 from Arts and 22 from Science of different Teacher Education Institutes as sample. The samples were taken from RNIASE, DPIASE, NDW CTE, CTE Balasore, CTE Rourkela, KSUB CTE, UG CTE, DD University, VD University, AATC Fakirpur, Govt. B.Ed Training College (Kalinga) Kandhamal, Hindi Teacher Training Institute (HTTI) Cuttack, Rajdhani College Bhubaneswar, Shailabala Autonomous College Cuttack, F.M Autonomous College Balasore, Bhadrak Autonomous College, Panchayat College Bargarh.

TOOL FOR DATA COLLECTION:

The study aimed at studying the Techno-Pedagogical Competencies among Teacher-Educators. Thus, a self-developed Techno-Pedagogical Competency Scale was used in the study. Then, the scale was converted into a Google form and was sent to the Teacher-Educators of different Teacher-Education Institutions.

DIMENSIONS COVERED:

The following dimensions covered in the scale:

- a) Technological Knowledge
- b) Pedagogical Knowledge
- c) Techno-Pedagogical Knowledge

SCORING PROCEDURE:

The scoring procedure of Teacher's Techno-Pedagogical Competency Scale is given in table.

Types of Statement	Always (A)	Sometimes (S)	Uncertain (U)	Rarely (R)	Never (N)
Score	5	4	3	2	1

PROCEDURE OF DATA COLLECTION:

The investigator conducted this study in online mode by preparing a Google form of the self-made Techno-Pedagogical Competency Scale and sent it to the Teacher-Educators of different Teacher Education Institutions (TEIs). The responses were then collected through the same Google form and the further proceedings were done.

TECHNIQUES OF DATA ANALYSIS:

For the analysis of data, the investigator had selected 't-test'. The t-distribution is a theoretical distribution discovered by W.S. Gosset in 1908 to find out the difference to 2 sample mean scores. It is a Parametric Statistic widely used for its reliable results.

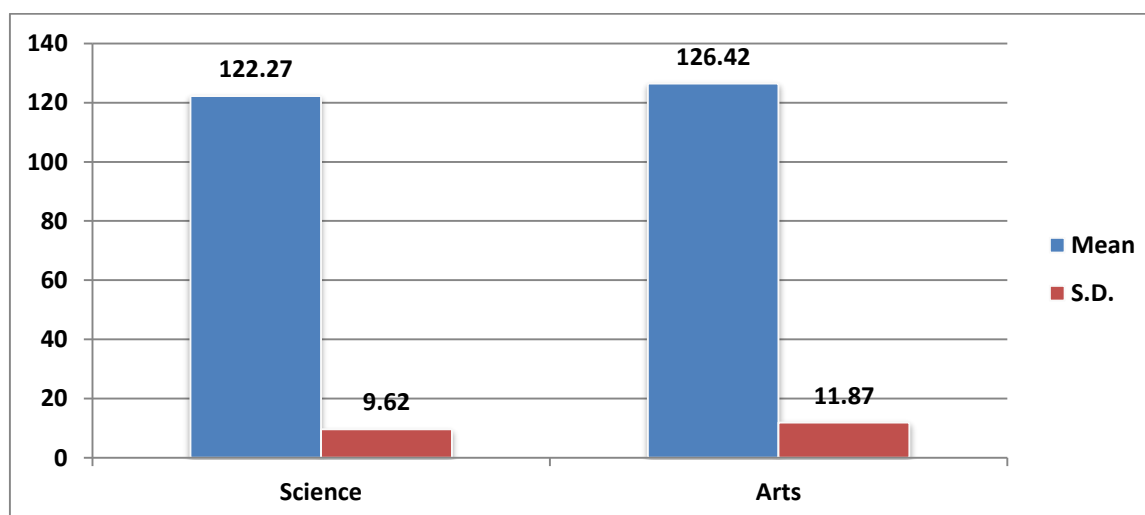
ANALYSIS AND INTERPRETATION OF DATA:

H₀1: There is no significant difference in Techno-pedagogical competency mean scores of Teacher Educators with references to their stream of teaching.

To find out the difference of Techno-Pedagogical Competency of Teacher Educators belonging to Arts and Science the t-value was found out. The observed value at 0.05 level is:

Stream	N	Mean	S.D.	df	Calculated t-value	Table t-value	Level of Significance
Arts	28	126.42	11.87	48	1.36	2.01	0.05
Science	22	122.27	9.62				

Table-1: Mean and S.D of Techno-Pedagogical Competency Scale of Science and Arts Teacher Educators



df= 48, Level of Significance= 0.05

INTERPRETATION OF DATA:

It is clear from table that there is no significant difference between Science and Arts stream Teacher-Educators on the measure of their Techno-Pedagogical Competency. The mean score of science teachers is 122.27 while the mean score of arts teachers is 126.42, whereas their S.Ds are 9.62 and 11.87 respectively. When the t test was applied to find out the significance of difference between these two means, the value of "t" was found as 1.36 which is not significant at 0.05 level of significance at 48 degree of freedom. This

finding reveals that both the science and arts stream teacher educators have similar level of Techno-Pedagogical Competency. So, the Null Hypothesis was accepted in this study.

Here, the calculated t value is 1.36 which is less than table value of t is 2.01.

$$\text{Thus, } 1.36 < 2.01$$

So, the Null hypothesis is accepted which means there is no difference between arts and science teacher educators with reference to their Techno-Pedagogical Competencies.

FINDINGS OF THE STUDY:

From the above study it is found that, there was no significant difference of techno pedagogical competency between Science and Arts Teacher-Educators because the calculated value of 't' is less than standard table t value at 0.05 level of significance, therefore the stated null hypothesis was accepted. The study revealed that Teacher-Educators of both arts and science stream possess similar level of Techno-Pedagogical Competence in teaching.

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