TECHNO-PEDAGOGICAL SKILL AMONG SECONDARY SCHOOL TEACHERS IN CALICUT DISTRICT

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Dissertation

Submitted to the University of Calicut for

Partial Fulfillment of the Requirements for the Degree of

MASTER OF EDUCATION

FAROOK TRAINING COLLEGE
RESEARCH CENTRE IN EDUCATION
UNIVERSITY OF CALICUT
July 2019

DECLARATION

I, SURABHILA.T.R do hereby declare that this dissertation, "Techno-Pedagogical Skill among Secondary School Teachers in Calicut District" has not been submitted by me for the award of any Degree, Diploma, Title or Recognition before.

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CERTIFICATE

I, Dr. T. MOHAMED SALEEM, do here by certify that the dissertation entitled Techno-Pedagogical Skill among Secondary School Teachers in Calicut District, is a record of bonafide study and research carried out by SURABHILA.T.R., of M.Ed Programme (2017-19), under my supervision and guidance, and has not been submitted by her for the award of any Degree, Diploma, Title or Recognition before.

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ACKNOWLEDGEMENT

At the very outset the investigator thanks the most merciful God, who enabled her to successfully complete the task.

The investigator is deeply indebted to her supervising Teacher, Dr. T. Mohamed Saleem., Associate Professor, Farook Training College, for his constant encouragement, generous help and valuable suggestions combined with expert criticism and guidance throughout the period of study.

The investigator would like to express her profound gratitude to Dr. C.A. Jawahar, Principal, Farook Training College, for his whole hearted co-operation in extending the facilities and encouragement to conduct this study.

The investigator expresses his sincere thanks to Dr. Manoj Praveen G., Associate Professor, Farook Training College, for providing support and coordinating the two year M.Ed. programme effectively.

The investigator also expresses her thanks to the librarian, and supporting staff of Farook Training College for their co-operation.

The investigator would also be thankful to the teachers and classmates of Farook Training College for their support and encouragement during study.

The investigator acknowledges the immense moral support and encouragement received from her family and friends who have been a constant source of inspiration for the study.

Farook Training College, SURABHILA.T,R

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INTRODUCTION

“Education is not the filling of a pail, but the lighting of a fire.”

Education may be defined as a systematic process of determining the extent in which the objectives are achieved by the public. According to Tagore, “Education is that which does not merely give us information but makes our life in harmony with all existence.” As the twenty-first century approaches, the literate citizen is increasingly expected to use computer technology to access and manipulate information. Knowing how to manage electronic information from an ever-widening array of resources and in proliferating formats is essential.

Education system is now spectator a paradigm shift from the traditional chalk- and-talk teaching methodology to digitizing the pedagogical approach through technical devices. It opines that such a transformation is not only increasing the potentiality of the teachers but also widening the information base of students so as make them competitive in the international arena. In today's world, most people need to keep on updating both their skills and knowledge to meet the challenges of everyday life.

Techno-pedagogy can be considered as the weaving of the technologies of the craft of teaching into the learning environment itself. It requires conscious recognition of the mediated learning environment in order to maximize the ease and clarity in the transmission of information. Acquiring techno-pedagogical proficiency will make teaching and learning a pleasurable exercise as it would lessen the

pressure on the teachers, and enable the students to plunge deeper into knowledge acquisition process.

Modernization trend, facilitated by rapid technological changes, presents at least two challenges for educators. The first challenge is that, teachers must stay abreast of relevant instructional technologies. That is, they must be able to assess the value of educational technologies, and acquire and continually update their technological skills.

Second one is that teachers will have to begin blending new technologies into their instructional settings. To successfully upgrade skills and integrate technology into the educational environment, teachers will have to make a time commitment and education departments will need to provide ample training and support for instructional practitioners.

Techno-pedagogical competency is very much needed for teachers in their learning space, as it facilitates teaching and learning. Techno-pedagogical competency is the ability of teachers to make use of technology effectively in teaching. It is described as the ability and the will to regularly apply the attitude, knowledge, and skills that promote learning.

Technology itself is an interactive medium for manipulating our world, so the process of acquiring the technology competencies must necessarily involve ample hands- on practice, access to a wide range of tools and most important, an opportunity to discover the impressive possibilities of technology. Technology pervades all walks of life and almost every field of human Endeavour; technology

skills are becoming essential in all subject areas because the computer is now the universal vehicle for the acquisition and dissemination of information in all fields. What's more, technology belongs throughout the entire curriculum because of its extraordinary potential for enhancing learning. Since computers can radically expand information access and communication, they especially benefit students with disabilities by increasing their participation in the learning process. Just as other professionals utilize specific technologies as tools to enhance their work, teachers must likewise become adept in putting technology to use as the field of educational software evolves with the various Techno-pedagogical competencies. Technology can support teachers in numerous professional activities first and foremost in stimulating learning beyond the classroom.

Teachers need to understand what types of materials are available, how to use them, why they should be used, when they should be used, and how to integrate them into the teaching/learning environment in order to meet the ultimate goal of improving education. Teachers also need to seriously consider how these newer materials can affect what and how we learn and teach.

School computing began in India in the early 80s. It gained momentum with pilot project Computer Literacy and Studies in Schools(CLASS) launched by Government of India. The objective of the project detailed in the report of a National workshop (NCERT,l984)were to provide student with a broad understanding f computer and their use ,familiarize students with the range of computer application in all walks of human life and the potential of the computer as an information processing tool. NPE (1986) suggested that the computers are fast becoming

available to schools and training in its use should be a part of education, especially professional (teacher) education.

In Kerala also technology becomes the integral part of the education while both teaching and learning. Traditional class rooms are shifted into advanced smart class rooms with ICT tools like computer, projector and other smart devices, networking hardware and the smarter application software which supporting the process of smart teaching and learning. As a part of the technological improvements, all government /aided schools are introduced IT as a special subject in their curriculum from 2002.Specializedsoftwares are developed for the purpose of conducting exams on the subject IT and both theory and practical exams are conducted effectively from 2005. In 2012-2013 all the written exams on the IT is stopped and complete computerized theory and practical exams are conducted.

Instead of appointing new teachers for the process of teaching the existing teachers where trained so that instead of making IT a separate subject all the teachers will be trained in using ICT in their own subject for making Teaching Learning process more meaningful. After the launch of IT@school program in 2001 in Kerala the government has conducted many training programs and classes to make teachers more capable in using the ICT facilities of the school. In this century after the introduction of TPACK system the usage of technology in rendering of the lesson is given more and more importance. The government of Kerala under the IT mission has conducted many training programs for teachers to get trained in the usage of technology in the class room. This study is trying to find out the extent of techno-Pedagogical skill of teachers of Calicut district.

Need and Significance of the Study

Countries all over the world have experienced an increasing demand for education at all levels and by all categories of learners. With a view to meeting this challenge along with other reforms in the existing Education system, attention has been given to the application of technology in the field of education. Usage of educational technology indicates that it can be an effective medium in providing quality education and training to all concerned. One of the goals of technology education is to promote technological literacy with a broad outlook and in an encompassing manner. To achieve this goal, technology education must prepare students to understand, control, and use technology. Students need to get adapted to technological change and learn to deal with forces that influence their lives, so as to potentially control their future. The paradigms for teaching technology education are changing. Technology education teachers and curriculum experts recommend a variety of differing instructional approaches such as self-paced modules, interdisciplinary methodology and problem solving techniques to educate students about technology and its impact on the society. Not all the instructional technologies are easily accessible and used by the teachers and the students during teaching learning process. The use of instructional technologies has been influenced by their availability; Technology will enhance learning, knowledge and skills while used. It plays its role at the initial level of syllabus framing to any other academic activity by means of efficient administration. Further, the teachers' academic and professional experiences get sharpened while they use instructional technology during Teaching Learning Process

The National Curriculum Framework (2005) stated that "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". However, research findings have shown that there exist socio-economic, cultural, time and geographical barriers for people who wish to pursue higher education. Innovative use of Information and Communication Technology can potentially solve this problem (Bhattacharya and Sharma, 2007). Report of the working group on higher education for the XII five year plan (2011), entitled that "Information and Communication Technology is a mission mode project to provide connectivity, valuable content and low cost computing devices to all the Institutions of learning in the country ."

The National Curriculum Framework for teacher education (2009) stated that "ICT can be imaginatively drawn upon for professional development and academic support of the pre- service and in-service teachers." Lee and Tsai (2010) found that meaningful use of ICT in the classroom demands the teachers to integrate technological affordances with pedagogical approaches for the specific subject matter to be taught. Yurdakul (2011) suggests that pre-service teachers need to provide opportunities to get practical knowledge and skills to use current technology during their training process. For that courses techno-pedagogical knowledge need to be added in teacher training programs. The technology centres in teaching and learning should be started in education institution.

Sathiyaraj and Rajasekar (2013) found in their study that the techno-pedagogical expertise needs to be improved in order to equip teachers to face the students belong to the digital era and also to face the challenges in the modern classroom. Monsivais,

McAnally and Lavigne (2014) found in their study that the integration of ICTs in the classroom depends on the teachers ability to scaffold the learning environment by using effective ICT based pedagogies.

Beaudin and Hadden (2004) revealed in their study that techno-pedagogical skill foster the students for further development, attainment of learning outcomes and maintain the context of designing classroom based resources through the use of ICT by the teachers. Therefore, techno- pedagogy method was a necessary component of teacher education. Koehler and Mishra (2005) found in their study that good teaching was not simply adding technology rather the introduction of technology causes the representation of new concepts and requires developing sensitivity to the dynamic, transactional relationship among technology, pedagogy, content and knowledge. Techno-pedagogical skills knowledge carried out based on to increase the effectiveness and efficiency of learning and teaching process for professional development by technology integration. (Archambault & Crippen, 2009; Cox & Graham, 2009).

In a UGC supported national seminar organized under the aegis of department of education of Annamalai University at Chidambaram (13th March 2012) on “Techno- Pedagogical proficiencies-pleasure and pressure”, all the speakers stated that acquiring Techno-pedagogical proficiencies will make teaching

learning a pleasurable exercise as it would lessen the pressure on the teachers and enable the students to delve deeper into domain of knowledge. Vice-Chancellor M.Ramanathan in his speech said that technology had made inroads into every sphere of human activity, including the field of education. It had totally transformed the face of didactic teaching and brought about far reaching changes in the way in which knowledge was being shared. Dr Ramanathan said, the terms “pleasure and pressure” should not get blurred and the distinction could be kept intact if the teachers with appropriate techno-pedagogical skills make teaching a “pleasurable” experience without feeling much of “pressure.”

Knowledge about the technology is important in itself, but not as separate. Today the techno-pedagogical competency and skill are very much needed for teachers in teaching and learning process, as it facilitates effective teaching and learning. The techno- pedagogical competency is nothing but the ability of the teachers to make use of technology effectively in teaching. The teachers develop techno-pedagogical competencies then they may try to make use of this often in teaching and it will in turn make the learning process simple and effective. In techno-pedagogy, there are three areas of knowledge, namely: content, pedagogy, and technology. Content is the subject matter that is to be taught. Technology encompasses modern technologies such as computer, Internet, digital video and commonplace technologies including overhead projectors, blackboards, and books. Pedagogy describes the collected practices, processes, strategies, procedures, and methods of teaching and learning. It also includes knowledge about the aims of instruction, assessment, and student learning.

Techno-pedagogy is a key deciding factor for the hybrid approach of meta-teaching. The last two decades have witnessed the inclusion of developments in techno-pedagogical skills in education systems around the world. Use of techno-pedagogical skills can break down some of the barriers that lead to underachievement, student disaffection and educational exclusion (Das, 2007). However, when one looks around, in most of the schools, colleges and universities across the country lack of harnessing of this potential is visible. In spite of the fact that planning and implementation of initiatives for enhancing role of techno-pedagogical skills in education have received priority, analysis of the existing scenario reveals number of factors which have been impeding the integration of technology in educational sector. Apart from the policies related to the technology, governments and education institutions will need to develop strategies for effective techno-pedagogical skills and media deployment and sustainability. Finally, technology is never a substitute for good teaching. Without techno- pedagogical skilled instructors, no electronic delivery can achieve good results.

Teachers need to understand what types of materials are available, how to use them, why they should be used, when they should be used, and how to integrate them into the teaching/learning environment in order to meet the ultimate goal of improving education. Teachers also need to seriously consider how these newer materials can affect what and how we learn and teach.

NCERT (2001) has brought out curriculum guide and syllabus for IT in schools within framework of education. Government of Kerala has to introduce computer education to all Secondary school and higher secondary schools.

Department of Education Technology of the SCERT aims to develop a common vision of Educational Technology and its functioning in the Kerala context with the help of expert in field of IT. It provides technological support to other department of the SCERT, DIET is now working in association with a new project named IT @ School Project. For IT @ School Project a vision document prepared by the state appointed task force headed by Prof. U.R.Rao in the year 2000.

IT @ school project in Kerala, launched in 2001 remodelled traditional teaching methodology in class room through the use of information technology. From the launching time till date the IT mission has conducted many training programs for teacher's .They have spend a huge amount to give schools the proper infrastructure. The class rooms of the aided and government schools are provided with smart boards and projectors for the teachers. The study is an attempt to find the techno-pedagogical skill of secondary school teachers in Calicut district.

Statement of Problem

The present study is entitled as; "**Techno-Pedagogical Skill among Secondary School Teachers in Calicut District**."

Definition of Key Terms

Techno-Pedagogical Skill

In this study the techno-pedagogical skill is operationally defined as the ability to integrate content knowledge, pedagogical knowledge and technological knowledge for the effective teaching learning process.

Secondary School Teacher

The secondary school students mean those students in VIII, IX and X standards of high schools in Kerala which follows Kerala state syllabus.

Variables of the Study

Techno-pedagogical skill of secondary school teachers is the variable for the present study.

Objectives of the Study

The objectives of the study are:

1. To find out the extent of Techno-Pedagogical skill among secondary school teachers in Calicut district for the total sample and relevant subsamples based on gender and Educational qualification.

2. To find out whether there exist any significant difference between the mean scores of techno-pedagogical skill of secondary school teachers on the sub samples based on:

- Gender
- Educational Qualification.

3. To evaluate the status of techno-pedagogic culture among the secondary schools of Calicut district

Hypotheses of the Study

The present study is designed to test the following hypotheses.

1. There exists no significant difference in techno-pedagogical skill among secondary school teachers in the sub sample based on gender.

2. There exists no significant difference in techno-pedagogical skill among secondary school teachers in the sub sample based on qualification

Methodology

Methodology deals precisely with the sources of data, tool employed for the study and method adopted for the study.The present study is intended to know about the Techno-pedagogical skill of secondary school teachers. And hence survey method was used for the conduction of the study.

Sample

The population considered for the study comprised of secondary school teachers in Calicut district. The present study was conducted on a sample of 300 secondary school teachers and 20 head of the schools from secondary schools of Calicut district in Kerala State. The samples is selected using by stratified sampling technique by giving due representation to Gender, Locale, Educational Qualification and Type of management.

Tools for Data Collection

The following tools are used in the study for the purpose of collecting relevant information

- Techno-Pedagogical Skill Assessment Scale (Surabhila And Saleem 2019)
- Interview schedule on Techno-Pedagogical Skill of teachers for head masters (Surabhila And Saleem 2019)

Statistical Techniques Used

Following statistical techniques are suggested to analyse the data for the proposed study

1. Percentage analysis
2. Test of significance

Data Collection Procedure

The data required for the present study have collected from the selected sample. After getting permission from various heads of secondary schools of Kozhikode district of Kerala State, the investigator administer the tools and collected data from the secondary schools of the district using both scale and the personal interview with the headmasters.

Scope and Limitations of the study

The study is intended to investigate the technological awareness and the techno-pedagogical skill of the secondary school teachers. Appropriate and standard

tool was employed to measure the data. The investigator developed the tool with the help of a supervising teacher. The study was conducted on a sample of 300 secondary school teachers of various schools of Kozhikode district of Kerala state. Due representation was given to factor like Locale and Type of Management while selecting the sample. Analysis and interpretation was made by the use of authentic statistical techniques. Hence the investigator hopes the result yielded from the study would be reliable, valid and dependable. It is very essential to study the techno-pedagogical skill of teachers for making the students of this generation to be competent enough to face the next generation.

Limitations of the study

The investigator tried to make the study as successful as possible, certain limitations have crept to the study. The sample selected for the study is not a state wide sample. Due to the time limitations, it was confined into one district of Kerala state, Kozhikode. The study is conducted on the teachers of Government and Aided schools. Teachers are sometimes reluctant to give true reactions for some items. Time has limited the investigator from class observations. The teachers of middle and higher secondary has not been taken for study

Organization of the Report

The whole report is presented in five chapters.

Chapter I

The first chapter presents a brief introduction of the problem, need, and significance of the study, statement of the problem, definition of key terms, variables of the study, objectives of the study, hypotheses of the study, methodology, scope, and limitations of the study.

Chapter II

The second chapter contains review of the studies related to the present investigation, done in India and in other countries related to techno-pedagogical skill and the TPACK concept.

Chapter III

The third chapter describes methodology of the study in detail with the description of variables, objectives, hypotheses, tools employed for data collection, sample selected, data collection procedure and statistical techniques used for the analysis.

Chapter IV

The fourth chapter includes the details of the analysis of data as per the objectives of the study.

Chapter V

Chapter V contains the description regarding the study in retrospect major findings, conclusion, educational implications and suggestions for further research.

Chapter 2

REVIEW OF RELATED LITERATURE

- Conceptual Framework of Techno-Pedagogical Skill
- Studies Related to Techno-Pedagogical Skill

REVIEW OF RELATED LITERATURE

A literature review is an essential part of any type of research that aims to review the critical point of current knowledge including substantive findings as well as a theoretical and methodological contribution to a particular topic. Literature review is a search and evaluation of the available literature in our chosen topic area. The review helps the investigator to survey the literature in the chosen area of study as well as to synthesize the information into a summary. It allows the researcher to acquaint himself/herself with current knowledge in the field or area in which he/she is going to conduct his/her research. Best & Kahn (2005) pointed out that review of related literature is a brief summary of previous research and writing of recognised experts provide the researchers familiar with what is already known and with what is still unknown and untested. Since effective research must be based on past knowledge, this step helps to eliminate the duplication of what has been done already and provides useful hypotheses and suggestions for significant investigation. The review of related literature paves a clear way for the investigator to present in a proper way to solve the prominent problem. It helps the investigator to form proper objective and hypothesis for the study. It avoids unnecessary duplicity of work.

The present study is an attempt to understand the techno pedagogical skill of the secondary school teachers of Calicut district .The chief aim of this literature review is to comprehensively investigate ideas, issues and themes related to the techno-pedagogical skills of the secondary school teacher. To achieve this goal, the investigator collected as many studies as possible related to different aspects of the problem. Teachers with appropriate techno-pedagogical skills can make teaching a pleasurable experience without feeling much of pressure. Transformation from teachers to techno-pedagogue would not only increase the capability of the teachers but would also widen the knowledge base of students so as make them competitive in the international arena. It will be interesting to know; how present teacher of secondary school are working as techno-pedagogue. The review of the literature was classified and presented in the following heads,

- **Conceptual Framework of Techno-Pedagogical Skill**
- **Studies Related to Techno-Pedagogical Skill**

Conceptual Framework of Techno-Pedagogical Skill

Education is the process of facilitating learning. Knowledge, skills, values, beliefs and habits of a group of people are transferred to other group through teaching, training and research. The National Policy of Education; 1964-66 marked a significant step in the history of post independent education. It's aimed to promote national progress, a sense of common citizenship and culture and to strengthen national integration. It laid stress

on the need for a radical reconstruction of the education system, to improve its quality at all stages and gave much greater attention to science and technology. Teaching is a unique professional human activity, in which teachers creativity and imaginatively use their knowledge to promote the teaching and learning. How teaching is conducted has a strong impact on student's abilities and skills to educate themselves. Successful teachers present powerful cognitive and social task to their students and teach the students how to make productive use of them.

Like all the other aspects of human life, education also significantly contributed by modern day technologies. The Association for Educational Communications and Technology (AECT): has defined education technology as " Educational technology is the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources."

Educational technology is a field of study that investigates the process of analyzing, designing, developing, implementing, and evaluating the instructional environment and learning materials in order to improve teaching and learning.

The learning materials today have greatly expanded because of the various technological advances. Instructional materials include more conventional materials, such as the blackboard, overhead projectors, televisions, VCRs, overhead projectors, slide projectors, and opaque projectors, as well as newer materials, such as the computer, various

software applications, LCD projectors, camcorders, digital cameras, scanners, the Internet, satellite, interactive TV, audio and video conferencing, artificial intelligence.

The 21St century is the age of IT. A remarkable trend in the field of education during the last decades all over the globe has been the use of ICT in making education productive giving instruction a more powerful and scientific base extending the educational opportunities to the masses and creating an new learning environment and information rich society. The modes of teaching and curriculum are changing in many times from the beginning to till now. A sudden change in the education is happened with the introduction of Information Technology (IT). The motivation of information technology is to shift traditional education system into an advanced level with maximum utilization of the technology. E-Learning, Course Management Systems (CMS) and finally Massive Open Online Course (MOOC) are the major by products of these technological advancements. Education research and all its aspects are now seriously looking in to the implementation and advancements in the Information and Communication Technology (ICT). The academic society is curiously searching and applying the information and communication technology tools in a large way around the preschool to the top level research society.

Techno-Pedagogy

Technology encompasses modern technologies such as computer, Internet, digital video and commonplace technologies including overhead projectors, blackboards, and books.

Pedagogy describes the collected practices, processes, strategies, procedures, and methods of teaching and learning. It also includes knowledge about the aims of instruction, assessment, and student learning.

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'. 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 maximise the ease and clarity in the transmission of information. It may also be used to describe the medium specific learning strategies inherent in each technological form, where the medium facilitates or contributes to the learning process.

Techno-pedagogy refers Electronically mediated courses that integrate sound pedagogic principles of teaching/learning with the use of technology (H.Connors 2001). Technology in the professional develops specific techno- pedagogical competencies allows faculty to make the work practitioners at the centre of professional study in a community of practice.

The techno-pedagogical knowledge is a collaboratively developed frame work of scholars and researches seeking to conceptualize and clarify the competencies that evolve from the intersection between pedagogy and technology. Investments and interactive technologies in education require both the technological and pedagogical skills to use them.

Importance of Techno-Pedagogical Skill

Teaching jobs are regarded as the noblest of all the professions in the world. The quality of education in any educational institute hinges on the availability of good teachers. “Technology won’t replace teachers. But Teachers who use technology will probably replace Teachers who do not.” It is important to recognize that, the teachers are becoming more knowledgeable of Information and Communication Technology outcomes (ICTs), they continue to have knowledge or skill with which to integrate those technologies into their teaching. As the twenty-first century approaches, the literate citizen is increasingly expected to use computer technology to access and manipulate information. Knowing how to manage electronic information from an ever-widening array of resources and in proliferating formats is essential. The education system was now witnessing a paradigm shift from the traditional chalk-and-board teaching methodology to digitizing the pedagogical approach through technical devices. A transformation would not only increase the capability of the teachers but would also widen the knowledge base of students so as make them competitive in the international arena. The technology orientation needs to

improve in order to equip themselves to face the students belong to the digital era and also to face the challenges in the modern classroom.

Educational technologies existed long before the advent of computers. From the abacus to the VCR, from the slate to the calculator, from printed textbooks to CD ROMs, students and teachers have made use of numerous technologies to aid in the construction and presentation of educational materials.

Technologies seem to help 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 teachers diversify both their teaching strategies and the activities they expect learners to accomplish.

Technology helps teacher to be more professional as they allow them to have an increased access to a great variety of up-to-date resources to improve teaching/learning activities. It helps them present new concepts, theories or ideas and helps to nurture student motivation, an important challenge, especially at the high school level. Technology is a very useful means to increase communication with various people involved in their field practice (co-operating teacher, university supervisor, colleagues and peers, other professors, parents, etc.).Use of Information and Communication Technology increases collaboration and communication during the process of teaching-learning. Technology integration helps

teachers in various ways to face pedagogical and other challenges encountered during their teaching. Integrating technology in the classroom redefines established teacher-learner relationships and teaching-learning styles.

In today's world, most people need to keep on updating both their skills and knowledge to meet the challenges of everyday life. This has spurred new learning needs which exceed by far the formal courses, provided commonly by institutions, which allow targeting a general public. Instead, the needed trainings must be more informal in order to better address individual needs. The National Curriculum Framework (2005), stated that “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”. However, research findings have shown that there exist socio-economic, cultural, time and geographical barriers for people who wish to pursue higher education. Innovative use of Information and Communication Technology can potentially solve this problem (Bhattacharya and Sharma, 2007). Report of the working group on higher education for the XII five year plan (2011), entitled that “Information and Communication Technology is a mission mode project to provide connectivity, valuable content and low cost computing devices to all the Institutions of higher learning in the country. A National Knowledge Network will interconnect all universities, libraries, laboratories, hospitals and agricultural institutions for sharing data and computing resources across

the country over a high-speed information network having gigabit capabilities.

Teaching holds the most crucial position and helps in the success of any educational system. A teacher is the topmost academic and professional person in the educational pyramid who shapes the learners. Technology is a broad and constantly changing skill-set required of faculty, and selecting the appropriate techno-pedagogical strategies to effectively engage students in the content is a separate skill-set. Media literacy influences student development, and developing a critical analysis of media consumption is an important skill for students. In understanding how technology and media intersect with learning, consider the compatibility between theories of technology and education, and how that relates to the content. There is a need for Teachers as well as the institutional level, to identify and articulate the occupational realities when technology and competencies intersect, while understanding and communicating how technological resources and strategies can engage students and enhance student learning.

The TPACK Framework

The TPACK framework builds on Shulman's (1987, 1986) descriptions of PCK to describe how teachers' understanding of educational technologies and PCK interact with one another to produce effective teaching with technology. The conception of TPACK described here has developed over time and through a series of publications, with the most

complete descriptions of the framework found in Mishra and Koehler (2006).

In this model (see Figure 1), there are three main components of teachers' knowledge: content, pedagogy, and technology. Equally important to the model are the interactions between and among these bodies of knowledge, represented as PCK (Pedagogical Content Knowledge), TCK (Technological Content Knowledge), TPK (Technological Pedagogical Knowledge), and TPACK (Technology Pedagogy And Content Knowledge)

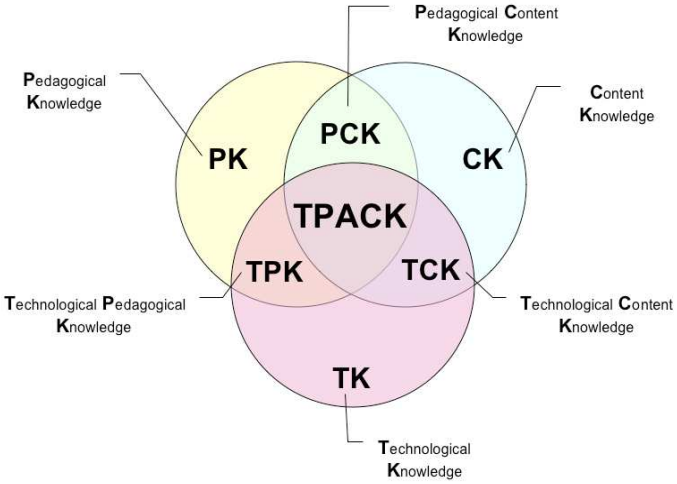

Figure 1: The TPACK framework and its knowledge components.

Content Knowledge (CK)

Content knowledge (CK) is teachers' knowledge about the subject matter to be learned or taught. The content to be covered in middle school science or history is different from the content to be covered in an undergraduate course on art appreciation or a graduate seminar on

astrophysics. Knowledge of content is of critical importance for teachers. As Shulman (1986) noted, this knowledge would include knowledge of concepts, theories, ideas, organizational frameworks, knowledge of evidence and proof, as well as established practices and approaches toward developing such knowledge. Knowledge and the nature of inquiry differ greatly between fields, and teachers should understand the deeper knowledge fundamentals of the disciplines in which they teach.

Pedagogical Knowledge (PK)

Pedagogical knowledge (PK) is teachers' deep knowledge about the processes and practices or methods of teaching and learning. They encompass, among other things, overall educational purposes, values, and aims. This generic form of knowledge applies to understanding how students learn, general classroom management skills, lesson planning, and student assessment. It includes knowledge about techniques or methods used in the classroom; the nature of the target audience; and strategies for evaluating student understanding. A teacher with deep pedagogical knowledge understands how students construct knowledge and acquire skills and how they develop habits of mind and positive dispositions toward learning. So pedagogical knowledge requires an understanding of cognitive, social, and developmental theories of learning and how they apply to students in the classroom

Technological Knowledge (TK)

Technology knowledge (TK) is always in a state of flux—more so than the other two core knowledge domains in the TPACK framework (pedagogy and content). Any definition of technology knowledge is in danger of becoming outdated by the time this text has been published. it can be told as the certain ways of thinking about and working with technology can apply to all technology tools and resources.

Pedagogical Content Knowledge (PCK)

PCK is consistent with and similar to Shulman's idea of knowledge of pedagogy that is applicable to the teaching of specific content. Central to Shulman's conceptualization of PCK is the notion of the transformation of the subject matter for teaching. According to Shulman (1986), this transformation occurs as the teacher interprets the subject matter, finds multiple ways to represent it, and adapts and tailors the instructional materials to alternative conceptions and students' prior knowledge. PCK covers the core business of teaching, learning, curriculum, assessment and reporting, such as the conditions that promote learning and the links among curriculum, assessment, and pedagogy. An awareness of common misconceptions and ways of looking at them, the importance of forging connections among different content-based ideas, students' prior knowledge, alternative teaching strategies, and the flexibility that comes from exploring alternative ways of looking at the same idea or problem are all essential for effective teaching

Technological Content Knowledge (TCK)

Technology and content knowledge have a deep historical relationship. Progress in fields as diverse as medicine, history, archeology, and physics have coincided with the development of new technologies that afford the representation and manipulation of data in new and fruitful ways. Understanding the impact of technology on the practices and knowledge of a given discipline is critical to developing appropriate technological tools for educational purposes. The choice of technologies affords and constrains the types of content ideas that can be taught. Technology can constrain the types of possible representations, but also can afford the construction of newer and more varied representations. Technological tools can provide a greater degree of flexibility in navigating across these representations.

TCK is an understanding of the manner in which technology and content influence and constrain one another. Teachers need to master more than the subject matter they teach; they must also have a deep understanding of the manner in which the subject matter (or the kinds of representations that can be constructed) can be changed by the application of particular technologies. Teachers need to understand which specific technologies are best suited for addressing subject-matter learning in their domains and how the content dictates or perhaps even changes the technology—or vice versa.

Technological Pedagogical Knowledge (TPK)

TPK is an understanding of how teaching and learning can change when particular technologies are used in particular ways. This includes knowing the pedagogical affordances and constraints of a range of technological tools as they relate to disciplinarily and developmentally appropriate pedagogical designs and strategies. To build TPK, a deeper understanding of the constraints and affordances of technologies and the disciplinary contexts within which they function is needed.

TPK becomes particularly important because most popular software programs are not designed for educational purposes. Software programs such as the Microsoft Office Suite (Word, PowerPoint, Excel and MSN Messenger) are usually designed for business environments. Web-based technologies such as blogs or podcasts are designed for purposes of entertainment, communication, and social networking. Teachers need to reject functional fixedness and develop skills to look beyond most common uses for technologies, reconfiguring them for customized pedagogical purposes. Thus, TPK requires a forward-looking, creative, and open-minded seeking of technology use, not for its own sake but for the sake of advancing student learning and understanding.

Technology, Pedagogy, and Content Knowledge

TPACK is an emergent form of knowledge that goes beyond all three "core" components (content, pedagogy, and technology).

Technological pedagogical content knowledge is an understanding that emerges from interactions among content, pedagogy, and technology knowledge. Underlying truly meaningful and deeply skilled teaching with technology, TPACK is different from knowledge of all three concepts individually.

TPACK is the basis of effective teaching with technology, requiring an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face; knowledge of students' prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge to develop new epistemologies or strengthen old ones.

Teaching with technology is a difficult thing to do well. The TPACK framework suggests that content, pedagogy, technology, and teaching/learning contexts have roles to play individually and together. Teaching successfully with technology requires continually creating, maintaining, and re-establishing a dynamic equilibrium among all components. It is worth noting that a range of factors influences how this equilibrium is reached.

Studies Related To Techno-Pedagogical Skill

Leema and Saleem. (2017) conducted a review on newly revised and restructured elementary teacher education curriculum of Kerala for contents to improve techno pedagogical skills of student teachers. And the paper performed an analysis on the effectiveness of the current contents enabling techno pedagogical skills, in the teacher education curriculum of Kerala and also, identify the challenges in transaction of technological contents in current syllabus. The investigators uncovered that the revised and restructured teacher education curriculum gives enough importance to technology integration. As far as improving techno pedagogical skills of teacher trainees are concerned, there are still many doubts will arise on the effective implementation. Some of the concerns are availability of technology infrastructure, skills needed for teacher educators to teach technology related elements, availability of time, motivation, quality of resources.

Baran, Bilici and Uygun (2016) underscored on utilizing innovations or technology in science training, the need has developed to get ready science educators with powerful innovation or technology coordination abilities. To address this need, a TPACK-based PD program was planned and actualized as a component of pre-service teacher preparing venture in Turkey. The investigation also uncovered that because of going to the PD, educators' TPACK expanded and supported over a time of one year.

Research and viable ramifications for planning pre-service science educator preparing programs are shared.

Jang and Tsai (2016) highlighted the connection between self-control and academic performances. The reason for this paper was to look at pre-service educators' improvement of TPACK with fitting Information and Communication Technologies (ICT) utilizing Content Specific Technologies (CST). Pre-service educators self-appraised their ICT-TPACK at two time focuses, and the empirical investigation showed critical distinction. The investigation of content knowledge demonstrated that pre-service educators utilized psychological control methodologies to build up their comprehension and application abilities on ICT-TPACK and could utilize intelligent practices to show their understanding of TPACK toward the finish of the semester.

Gur and Karmete (2015) conducted a short review of TPACK for Teacher Education, using Miles and Huberman's qualitative study framework. The study analyzed 116 articles that focused on ICT and TPACK. The study concludes with the recommendation to the teacher education program providers to analyze the policy documents of training programmes in the light of TPACK to create a deeper understanding of techno-pedagogy requirements.

Martin (2015) in his paper 'Successful Implementation of TPACK in Teacher Preparation Programs' examined recent publications on the topic of technology in teacher preparation through the theoretical lens of

Technology, Pedagogy and Content Knowledge (TPACK) which has shown potential to emphasize a teacher's understanding of how technologies can be used effectively as a pedagogical tool. From his paper through the review of TPACK literature, it is evident that many teacher preparation programs are relying on out-of-date technology models and are in need of redesign. Suggested improvements have to be made in the programmes to make the future teachers effective users of technology.

Nkwenti Ndongfack, M. (2015) constructed a model for teacher professional development on technology integration. The constructed model was named as Mastery of Active and Shared Learning Processes for Techno-Pedagogy (MASLEPT). The main aim of this study is to develop a more acceptable professional development model for technology integration among primary school teachers to achieve Cameroon's 2035 Vision. Quantitative data were collected through a nation-wide survey involving 400 in-service primary school teachers using stratified random sampling technique from the 10 Regions of Cameroon. The findings from this study indicated that teacher-participants preferred an on-going, school-based professional development model characterized by collaborative learning, problem solving and classroom follow-up was their preferred in-service training model.

Avidov-Ungar, O., and Iluz, I. E. (2014) examined the perspective of teacher educators and academic officials in an academic teacher education program regarding the integration of ICT in the teacher education

program. This mixed methods study combined quantitative and qualitative methods. Data was collected by means of a closed questionnaire, an open-ended questionnaire for the teacher educators (N = 68), and semi-structured interviews conducted with the academic officials (N = 12). Findings revealed a hierarchical range of ICT integration in teaching, which reflects different profiles of teacher educators who integrate innovative pedagogies.

Alexander C., Langub, L. W., and Rosen, D. (2014) presented the WDT Framework, which consists of three levels of integrating field-based technology experiences into early childhood education coursework. Early childhood teacher education programs have historically utilized field experiences for the purpose of helping pre-service teachers build their understanding of developmentally appropriate practice, yet technology integration is not typically included within this context. The majority of teacher education programs rely on one stand-alone technology integration course to prepare pre-service teachers to use technology in their teaching, which is known to have minimal impact on their willingness and ability to use technology in subsequent teaching experiences in the early childhood classroom. In response to this disparity, the authors propose three levels of immersion with technology for pre-service early childhood teachers: watching, doing, and teaching (WDT). Each approach to the technology-infused field experience is discussed, as well as lessons learned and conditions for success necessary for effective implementation in an early childhood teacher education sequence.

Ghavifekr Simin., et al (2014) conducted a study on ICT integration in teacher education. The main focus of this study is on effectiveness of ICT integration in education. Moreover, the objective of this study is to identify the level of ICT integration in teaching and learning process in classroom by primary school teachers. A total of 61 teachers from 10 public primary schools in Klang Valley, Malaysia have been selected randomly to complete this quantitative study's survey questionnaire. The findings reported that most of the teachers are normal users, and many teachers more frequently use ICT in the teachers' room for their work rather than using it in their classroom for teaching and learning. Moreover, results showed that teachers should always be ready and well-equipped in terms of ICT competencies and positive attitude to provide ICT-based learning opportunities for students to improve their learning quality.

Sibichen and Gopalakrishnan (2013) conducted a comparative study of theTechno-Pedagogical Skills of Prospective teachers. The objective of the study was to find out whether there is any significant difference among different optional subject B Ed students in their techno-pedagogical skills .The study found that there is no significant difference among English, Mathematics, Physical science and Social Science optional B Ed students in their skill in preparing learning material, implementing instructional strategy, communication and techno-pedagogical skills, but there is significant difference in their skill in learning, preparing lesson plan evaluation and guidance

Sathiyaraj. K., and Rajasekar. S. (2013) reported the relationship between the perceived techno-pedagogical competency and anxiety towards the use of instructional aids in teaching of the higher secondary school teachers. Normative survey method has been used in the present investigation. Random sampling technique has been used in the selection of the sample of as many as 627 higher secondary school teachers situated in Tiruvannamalai District, Tamilnadu, India. The findings of the study showed that majority of the higher secondary school teachers were having an average level of perceived techno pedagogical competency and anxiety towards the use of instructional aids in teaching. The results also revealed that there is a significant negative relationship between techno-pedagogical competency and anxiety towards the use of instructional aids in teaching..

Sathiyaraj and Singaravelu (2013) used survey method to study on techno-pedagogical competency of higher secondary school teachers. The random sampling technique has been used in the selection of the sample from teachers working in higher secondary schools situated in Cuddalore district, Tamilnadu, India. The findings of the study showed that the majority of the higher secondary school teachers were having an average level of perceived techno-pedagogical competency. Also, it is found that there is no significant difference between the (i) male and female teachers, (ii) urban and rural school teachers (iii) government and private school teachers and (iv) married and unmarried teachers in respect of their perceived technopedagogical competency.

Lin, J. M.-C., et al (2012) described a two-dimensional model, namely pedagogy and technology, for use by teachers who aim to progress towards higher levels of ICT integration. Three Chinese language arts teachers, referred to as teachers A, B and C in the following discussion, were invited to participate in this research. All three participating teachers were female. Data were collected from these three cases through classroom observation and frequent interviews. The results showed that this model was able to adapt to individual preferences of the three participating teachers as well as guide their progressions in ICT integration.

Agyei Douglas D., and Voogt Joke.(2012) conducted a case study of four preservice mathematics teachers from the University of Cape Coast, Ghana, who worked in two design teams to develop lessons, and subsequently taught in a technology based environment for the first time. It was evident from the findings that more systematic efforts are needed to engage pre-service teachers in technology-rich design activities, to develop their TPCK adequately. The study also showed the potential of TPCK as a new frame for developing pre-service teachers' experiences in technology integration within initial teacher education, particularly in Sub-Saharan African countries.

De Jong., Terry. et al. (2012) studied in response to the imperative of teacher education courses incorporating National Professional Standards for Teachers, in particular Standard 7, which deals with the professional engagement of teachers (AITSL, 2011). It aimed to evaluate the efficacy of

simulation and active recall as a learner-centred pedagogy in facilitating pre-service teachers' learning about their capacity to self-regulate emotionally and its relevance to the profession. A simulated „critical incident' was used in a lecture to guide students (n=106) to analyse and understand their emotional responses to an altercation between the lecturer and a colleague. The evaluation involved both quantitative and qualitative data collection. The study generated six useful insights associated with the efficacy of simulation pedagogy and revealed convincingly that this pedagogy can engage students actively in learning about the importance of emotional self-regulation in relation to their professional role as a teacher.

Bhasin Bandhana (2012) reported the incorporation of technology into teaching and research is one of the most important challenges for education today. It is time to move beyond the walls of our classrooms to join forces with other institutions and societies to revitalize education. The paper focused on the use of technology in teaching-learning process that will greatly contribute to meet student needs for learning anywhere, anytime. Integration of Information and Communication Technologies (ICT) into teaching and learning process is a growing field which has variety of definitions according to different points of view. A very common view asserts that the application of ICT processes should be presented in an integrated way as well as concrete model need to be developed for the teachers in order for the integration process to improve students' learning. Based on the premise that "The integration process should strengthen

learning of students", there is a need to present an integrated point of view in the application of these processes and to develop some concrete examples for teachers. Therefore, the main purpose of this study is to develop a model.

Zhou George., et al (2011) conducted a case study investigates how well secondary preservice teachers are prepared to use technology in teaching in China. The study focused on a teacher education program that is a representative of many of those in mid-sized Chinese universities. It examines participants' experiences with, perspectives of, and expectations about the use of technology and the training they are receiving in this area. Data were collected through survey and interviews indicate that research participants have similar perspectives regarding the use of technology in teaching and the integration of technology in teacher education as their counterparts elsewhere. They reported an overall low level of ability to use technology and shared some concerns.

Teemu, Susanna, Jari, Patrick, Pertti and Stina (2011) conducted a study on confronting the technological pedagogical knowledge of Finnish 'Net Generation' student teachers. The study aims to find out "Net Generation" capabilities of 74 first-year student teachers in a Finnish university. The objectives of the study are (i) Net Generation students are adept at learning through discovery and thinking in a hypertext-like manner and (ii) when they enter the teaching profession; members of this generation will be able to transfer these characteristics into their teaching practices.

The research is formulated around an extended framework for student teachers' technological pedagogical knowledge. The students designed learning modules incorporating the use of information and communication technology. The learning modules were subjected to document and artefact analysis incorporating concept-driven coding.Supplementary data were collected through a questionnaire concerned with the students' adoption of new technologies. The findings in the study showed that assumptions about 'Net Generation' student teachers' abilities to adopt and adapt ICT in their teaching are highly questionable and that greater attention should be given to the development of their technological pedagogical knowledge.

Gok Bilge & Erdogan Tolga (2010) conducted a study to analyse the perceptions of the students through the metaphor analysis. This study was considered as a descriptive study. In the study a mixed method including quantitative and qualitative techniques was used. The study was carried out among the 1st, 2nd, 3rd and 4th grade students studying at Hacettepe University at the Department of Primary Education during the 2007-2008 Fall Term. The perceptions of the pre-service teachers at the Department of Primary Education were analysed through the content analysis. The metaphors developed by preservice teachers were analysed with appropriate statistical methods to find out whether it differentiates with various variables. In this study pre-service teachers developed one hundred five metaphors on technology and these metaphors were categorised into nine different categories. While there was a significant difference in their

perceptions of technology in terms of participants' general point average and learning to use technology, there was not a significant difference in terms of gender, grade and the frequency of technology use and background information about technology use.

Ajayi, L. (2009) examined the pre-service teachers' perceptions of their own learning are important to the ways they integrate technology into their practices. Thepurpose of this study was to examine the pre-service teachers' perspectives of asynchronous discussion board (ADB) as a tool of learning to teach. ADB was integrated into two literacy courses for 33 pre-service teachers over 16 weeks. Data were collected through oral interviews, written reflections, and participants' postings on the discussion board. The data were analyzed using Chi's (1997) framework of verbal analysis method. The findings indicated that the participants perceived ADB as an important tool of learning to teach because it promoted situated learning, facilitated a social construction of knowledge, and afforded customized learning experiences.

Campbella Malcolm., et al., (2008) conducted a quasi-experimental study on Online vs. face-to-face discussion in a web-based research methods course for postgraduate nursing students. The main objective of this research is to assess whether participation in face-to-face discussion seminars or online asynchronous discussion groups had different effects on educational attainment in a web-based course. Non-randomised or quasi-experimental design with two groups-students choosing to have face-to-face

discussion seminars and students choosing to have online discussions. The Core Methods module of a postgraduate research methods course. All 114 students participating in the first 2 year during which the course teaching material was delivered online. Background details of the students, their choices of modules and assignment marks were collected as part of the routine course administration. Students' online activities were identified using the student tracking facility within WebCT. Regression models were fitted to explore the association between available explanatory variables and assignment mark. Students choosing online discussions had a higher Core Methods assignment mark (mean 60.8/100) than students choosing face-to-face discussions (54.4); the difference was statistically significant (t ¼ 3.13, df ¼ 102, p ¼ 0.002), although this ignores confounding variables.

Gulbahar Yasemin., and Tinmaz Hasan. (2006) conducted a case study aimed to implement project-based learning by utilizing e-portfolio assessment in a smallscale classroom (N = 8). The Competent Design, Development, and Evaluation of Educational Software course in the curriculum of the Department of Computer Education and Instructional Technology was selected due to its strong relationship with real life while lending itself to addressing the major concern of project-based learning. Despite insufficient classroom size and students' challenges on animationsoftware, it was found that project-based learning was an appropriate choice for conducting such a course. Moreover, e-portfolio assessment proved to be valuable in project-based learning. In the rest of the

paper, findings from other research studies evaluating project-based learning are discussed and recommendations are presented.

Angeli Charoula (2005) examined a study and an instructional design model was employed for restructuring a teacher education course with technology. The model was applied in a science education method course. Using tools, such as multimedia authoring tools in the fall semester and modeling software in the spring semester, teacher educators designed high quality technology-infused lessons for science and, thereafter, modeled them in classroom for pre service teachers. An assessment instrument was constructed to assess preservice teachers technology competency, which was measured in terms of four aspects, namely, (a) selection of appropriate science topics to be taught with technology, (b) use of appropriate technology-supported representations and transformations for science content, (c) use of technology to support teaching strategies, and (d) integration of computer activities with appropriate inquiry-based pedagogy in the science classroom. The results indicated that the task of preparing pre service teachers to become technology competent is difficult and requires many efforts for providing them with ample of opportunities during their education to develop the competencies needed to be able to teach with technology.

Laffey James M., and Espinosa Linda M. (2003) described how early childhood pre-service teachers appropriate, master, and/or resist learning to use technology in teaching. The data collected were part of a

three-year study of an entire teacher education program supported by the National Science Foundation. The study addresses how pre-service teachers become socialized to the role of teaching and how they develop as technology using teachers in a technology-rich, teacher education program. This article presents intensive case studies from their freshman to their senior years of two early childhood pre-service teachers. The findings suggest that the pathway to appropriation of technology as a teacher is not uni-dimensional and has a varying set of contributors and constraints.

Conclusion

From the review of related studies, the investigator has found that the techno-Pedagogical skill is related with there technological and content knowledge. A number of studies have been conducted in relation with the variable both in and outside India. At present secondary teachers are facing some difficulties in using technology. Investigator has also found that the teachers are given enough training, but some senior teachers are reluctant to use technology.

Chapter III

METHODOLOGY

- VARIABLE OF THE STUDY
- OBJECTIVES OF THE STUDY
- HYPOTHESES OF THE STUDY
- SAMPLE SELECTED FOR THE STUDY
- TOOL USED FOR DATA COLLECTION
- DATA COLLECTION PROCEDURE
- SCORING AND CONSOLIDATION OF DATA
- A STATISTICAL TECHNIQUE USED FOR ANALYSIS

METHODOLOGY

"Education research is the systematic and scholarly application of the scientific interpreted in its broadest sense; to the solution of educational problem" (Mouly, 1964).A scientific research needs proper methods and tools. The decision about the method depends upon the nature of research problem and the kinds of data necessary for its solution. The finding to a greater extend depends upon the method adopted and hence methodology has an important position in any type of research.

Research methodology is a way to systematically solve the research problem. It is the technique adopted for the research study by the investigator. According to webber, "Methodology is the science of method of arrangement". It describes the rationale for the application of specific procedures or techniques used to identify, select and analyze information applied to understanding the research problem, thereby, allowing the reader to critically evaluate the overall validity and reliability of the study.

The present study is an attempt to investigate the techno-pedagogical skill among teachers of secondary school .The methodology of the study requires the collection of relevant data and the statistical processing of the collected data with a view to obtain answers to the stated objectives. Therefore this chapter contains the following major headings:

- Variable of the study
- Objectives of the study

- Hypotheses of the study
- Sample selected for the study
- Tool used for data collection
- Data collection procedure
- Scoring and consolidation of data
- Statistical technique used for Analysis

Variable of the study

In the present study there is only one variable Techno-pedagogical skill of secondary school teachers.

Objectives of the Study

The objectives of the study are:

1. To find out the extent of Techno-Pedagogical skill among secondary school teachers in Calicut district for the total sample and relevant subsamples based on gender and Educational qualification.

2. To find out whether there exist any significant difference between the mean scores of techno-pedagogical skill of secondary school teachers on the sub samples based on:

    - Gender
    - Educational Qualification.

3. To evaluate the status of techno-pedagogic culture among the secondary schools of Calicut district

Hypotheses of the Study

The present study is designed to test the following hypotheses.

1. There exists no significant difference in techno-pedagogical skill among secondary school teachers in the sub sample based on gender.

2. There exists no significant difference in techno-pedagogical skill among secondary school teachers in the sub sample based on Educational qualification

Sample Selected for the Study

The consistency of any study is determined to a great extend on the selection of the sample. The sample should exhibit all the properties of the population it represents. A sample is a small portion of the population that is selected for observation and analysis; one can make certain inferences about the characteristics of the population from which it was drawn (Best & Kahn, 2012).

A good sample must be as nearly representative of the entire population as possible and ideally, it must provide the whole of the information about the population as possible and ideally it must provide the whole of the information about the population from which the sample has been dawn (Koul, 2009).

The population of the study comprised of secondary school Teachers and heads of the schools in Calicut district. The sample of the study constituted 300

secondary school Teachers and 20 Head of the school who were selected from 20 schools of Kozhikode district in Kerala state.

Stratified random sampling technique was applied to obtain a representative sample of the present study. In selection of sample due consideration was given to the Gender, Locale, Type of management and educational qualification. The details of sample is presented in Table 1 for teachers, Table 2 for Heads and Table 3 for schools.

Table 1: *The breakup of the final sample of teachers*

Area	Category	Size	Total
Gender	Male	150	300
	Female	150	
Locale	Rural	212	300
	Urban	88	
Type of Management	Govt	134	300
	Aided	166	
Educational Qualification	Graduate	150	300
	Post Graduate	150	

Table 2: *The breakup of the final sample of Head of the school*

Area	Category	Size	Total
Locale	Rural	16	20
	Urban	4	
Type of Management	Govt	9	20
	Aided	11	

Table 3: *School wise Distribution of sample of teachers*

Name of the school	**No. of Teachers**
Govt Higher secondary school, Iringallor	10
Govt High school, Kavilumpara	15
Govt Higher secondary school, Kuttiadi	15
P.T.C.M.High School , Kunduthode	15
C.M.H.S.S. Mannur North	15
A.J.J.M.H.S.S. Chathenkottanada	15
st.mary's H.S.S. Maruthomkara	17
K.P.E.S.High School, Kayakkode	15
U.H.Higher Secondary School, Chaliyam	15
R.K.Mission Higher secondary school,Meenchantha	16
Sanskrit High school, vattoli	17
Govt Higher secondary school, kallachi	13
R.N.M.High School, Narippatta	15
Govt Higher secondary school,Velliyode	15
Govt High school, Valayam	16
N.H.S.S Higher secondary school,Vattoli	20
Govt High School, Narikkuni	12
Govt Ganapath Higher secondary school ,Feroke	12
Farook H.S.S.Farook Colleage	20
Govt Higher secondary school cheruvanoor	12
Total	300

Tools used for Data Collection

Data must be gathered to analyze, interpret and to test the hypothesis formulated. According to J.W.Best" a great variety of methods and procedures has been developed to aid the acquisition of data". The instruments or devices used for

data collection are called Research tools. The success of research depends on the selection of suitable tools.

For the purpose of collecting data, the investigator used the following tools

- Techno-Pedagogical Skill Assessment Scale (Surabhila And Saleem 2019)
- Interview schedule on Techno-Pedagogical Skill of teachers for head masters (Surabhila And Saleem 2019)

A brief description of tool as follows:

Techno-Pedagogical Skill Assessment Scale

Techno-Pedagogical Skill Assessment Scale is prepared by investigator with the help of the supervising teacher. This scale was developed after reviewing a number of literatures. Abstracts from different types of journals and magazines regarding TPACK, Technological competency ect. The scale used to measure the techno-pedagogical skill of the secondary school teachers was developed through the five dimensions such as planning of the teaching, Instructional method and strategies, class rooms communication, evaluation and follow-up strategies.

The first step in the construction and standardization of the scale is planning of the scale. After selecting the topic, the investigator had gone through the theoretical background and analyzed related studies. It was found that Techno-pedagogical skill have a major role in the teaching learning process. In this study the investigator trying to find out the extent of techno-pedagogical skill among the secondary school teachers in Calicut district. After the discussion with the

supervising teacher, the investigator prepared the Scale to measure the Tehno-pedagogical skill of secondary school teachers. A detailed description of the 5 dimensions is given below.

Planning of the teaching

Items of the scale on this particular dimension include the planning process done by the teacher before the teaching-learning process. In this component, the items are included to measure the extent of knowledge of the teacher about the new technological advancement and about the new app available to make the planning of teaching easier.

eg: I, Used to log on to the Samagra Resource Portal and use its contents in the class

Instructional method and strategies

With this particular dimension the investigator is trying to measure the extent of technology usage in the instructional method and strategies used in class. The competence knowledge and skill in usage of the new technology available in this by the teacher is measured.

eg : I, Used to help students preparation of online Portfolio

Classrooms communication

Class room communication is the most important dimension in the teaching learning process. With this particular dimension the investigator is trying to measure the skill of using technology in class room communication.

eg: I am able to handle class using any type of LCD projectors

Evaluation

Evaluation dimension of the teaching and learning process is the important part for the teacher. A teacher should skilled to use the new technology tools in the evaluation.

eg: I, Used to encourage students to listen audio lessons

Follow-up strategies

Without a proper follow up the teacher cannot identify the drawbacks of the process.

eg: I, Used to give assignments to my students using Google Class Room Tools and ensure its submission

The dimension wise distribution of items on Scale on Techno-Pedagogical Skill is shown in table 4

Table 4: *Dimension wise distribution of items on in the Techno-Pedagogical Skill Assessment Scale*

SI. No.	Dimensions of Techno-pedagogical skills	Item No. in Scale	Total Number of Items
1	Planning of the teaching	1, 10, 19, 20, 28, 29, 37, 38, 46, 47	10
2	Instructional method and strategies	2, 3, 11, 12, 21, 22, 30, 31, 39, 40, 41, 48, 49	13
3	Class room communication	4, 5, 13, 14, 23, 24, 32, 42, 43, 50	10
4	Evaluation	6, 7, 15, 16, 25, 33, 34	7
5	Follow- up strategies	8, 9, 17, 18, 26, 27, 35, 36, 44, 45	10

The Draft copy of the Techno-pedagogical Skill Assessment scale (English and Malayalam version)is given in Appendix I and II.

The scale was organized in a Likert type, consisted of 50 items. The items are so framed that a subject has to respond to each item of the scale in any of the five ways viz., Always (A), Often (B), Sometimes (C), Rarely (D) and Never (E). Each of the items of the scale has five possible responses which are scored as 1, 2,3,4,5 respectively

Standardisation of the scale

The Techno-Pedagogical skill Assessment scale prepared was administered to the selected sample. Before administering the tool necessary instructions were given to the Teachers regarding how to mark the response. Scoring was done according to scoring procedure.Response sheets of 100 teachers were considered for item analysis.

Item Analysis

The response of 100 teachers was arranged in the rank order of total score obtained by them. The upper 27 percentage and lower 27 percentage was taken as the upper group and lower group respectively. The mean and standard deviation of the score obtained for the upper and lower groups were calculated. The t-value (critical ratio) for each item was calculated by using the following formula.

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{{s_1}^2}{n_1} + \frac{{s_2}^2}{n_2}}}$$

Where

$\overline{X}_1$ = mean of the upper group (for an item)

$\overline{X}_2$ = mean of the lower group (for an item)

s_1 = standard deviation of the upper group

s_2 = standard deviation of the lower group

n_1 = sample size of the upper group

n_2 = sample size of the upper group

Item with t-value greater than 1.96, cut off value for significance at 0.05 level, were selected for the final scale.

The critical ratio ('t'vlue) obtained for each item is given below in Table 5.

Table 5: *The critical ratio (' t'value) obtained of the items*

Item No	t-value	Item No	t-value
1	2.044	26	4.653
2	3.611	27	1.665*****
3	5.858	28	2.800
4	5.495	29	5.986
5	3.421	30	3.774
6	2.550	31	5.118
7	6.399	32	1.759*****
8	4.460	33	3.946
9	2.722	34	3.796
10	2.515	35	9.806
11	5.549	36	5.897
12	7.215	37	7.055
13	5.498	38	4.395
14	1.061*****	39	2.470

Item No	t-value	Item No	t-value
15	7.636	40	8.301
16	3.224	41	6.800
17	2.857	42	7.031
18	3.634	43	5.587
19	4.245	44	3.573
20	3.976	45	5.652
21	3.980	46	4.558
22	3.783	47	3.956
23	7.744	48	4.578
24	9.458	49	5.766
25	9.431	50	5.141

*Indicates the rejected items

Finalization of Scale

The critical ratio obtained for 47 items are greater than 1.96, the required values for significance at 0.05 levels, those items were selected for the final scale.

The final copy of the Techno-Pedagogical Skill Assessment scale (English, Malayalam version)is give in Appendix III and IV.

The validity of the Tool

Validity is the quality of a data gathered instrument that refers to degree to which a test measures what is intended to measure, when compared with accepted criteria. The Validity of the scale is the quality that enables us to measure what it supposed to measure. The validity of the tool is ensured through face validity by consulting with experts in the field of education. Some of the scale items were deleted and some were reconstructed as the suggestions given by the experts.

Reliability of the Tool

Reliability refers to the degree of consistency with which it measures what it is intended to measure. Reliability is the degree of consistency that instrument or procedure demonstrates whatever it is measuring; it does so consistently (Best & Kahn, 2014).). The investigator ensured the reliability of the tool by using Split-Half method. The scores are correlated by using Guttmann split half co efficient of correlation to obtain the reliability of the tool. The reliability coefficient was 0.894. The index suggested that the tool was reliable, which ensured the reliability of tool.

Interview schedule for head masters

The purpose of research interview is to explore the views, experiences, beliefs, and /or motivations of individuals on specific matters. Interviews are believed to provide deeper understanding of social phenomena and is thereof, most appropriate where little is already known about the studied phenomenon or where detailed insight are required from individual participants. Interview gives face - to-face information to the interviewer. In the present study, the investigator conducted a qualitative structured interview. Structured forms of questions are provided in order to get important and relevant responses.

The investigator, by reviewing studies on TPACK and usage of technology could make out that the teachers were rarely found of using innovative teaching strategies. Considering this, the investigator tried to identify the status of Techno-Pedagogical culture among secondary school teachers in Calicut and there by developed an interview schedule consisting of 10 items.

Before conducting the interview with prepared interview schedule, the investigator made a pilot study on two headmasters. This helped the investigator to make necessary changes in the interview schedule and then the tool was finalized. The tool used for this study is given in appendix V.

Description of the tool

The interview schedule consisted of 10 open ended question. At first the interviewer tried to make an acquaintance with the interviewee by introducing herself and the focus of the research problem. The interviewer could develop a rapport with the interviewee, the investigator gave a brief description of traditional teacher centered teaching strategies and the modern learner- centered technology based teaching strategies. The investigator wanted to know whether the teacher has realized that TPACK based teaching strategies are inevitable to cope up with the rapidity of the expanding knowledge.

Only a sound technologically developed environment can provide a sound, systematic, excellent teaching learning environment. The need and adequacy of the infrastructure for the IT based teaching strategies were examined through items. The investigator tries to know whether the teacher had received any training program on IT based teaching strategies. The investigator intended to know how the training helped the teacher to improve in modern teaching strategies. Towards the end of the interview the investigator wanted to know the reason as well as barriers for using the IT based strategy by the teachers.

Data Collection Procedure

The Scale on Techno-Pedagogical Skill was administered to the sample selected for the study. In order to collect data, the investigator asked permission from the Headmasters of high school in advance to administer the tool. The investigator briefed about the purpose of the study and the instruction regarding the manner of the response was given. After administering the tool response sheets were collected back by the investigator.

Prior to the interview the investigator tried to establish a rapport with participants so as to get a positive effect on the subsequent development of the interview. At the same time the investigator was very careful to select the venue of interview free from distractions and most suitable for the participation. During interview, the investigator took serious care to listen attentively to what was being said, so that participants were able to recount their experience as much as possible without unnecessary interruptions. The investigator recorded and immediately after the interview made detailed notes about observations, thoughts and ideas conveyed.

Scoring and Consolidating of Data

Scoring and consolidation of responses where done according to the direction provided with the scale. The incomplete response sheets where rejected by the investigator.

Teachers are to respond to the Items of the scale in any of the five ways viz., Always (A), Often (B), Sometimes (C), Rarely (D) and Never (E)which are scored

1,2,3,4and 5 respectively. The score of all the items was added to get the total score on Techno-Pedagogical Skill of secondary school teachers.

The Personal data sheet was used to collect general information such as Name, Qualification, online course attended, email, blog, twitter, social media account etc.

Statistical Techniques Used for Analysis

For the present study the investigator used the following statistical techniques.

Preliminary Analysis

The important statistical constants such as mean, median, mode, standard deviation, skewness and kurtosis of the variables were computed for the total samples.

Percentage Analysis

The extent of Techno-pedagogical skill of teacher in the total sample and relevant subsamples based on gender and Educational qualification was established by calculating mean scores and SD.The total number of teachers was classified as high group, moderate group and low group based on the following criteria.

Mean + 1SD	=	High group
Mean – 1SD	=	low group
Between High and Low	=	Moderate group

Test of significance of difference between Mean (t-test)

The statistical technique, Test of significance of difference between Mean **(t-test)** is used to find out if there exist any significant difference between the mean scores of techno-pedagogical skill of secondary school teachers on the sub samples based on:

- Gender
- Educational Qualification.

Chapter IV

ANALYSIS AND INTERPRETATION

- Objectives of the study
- Hypotheses of the study
- Preliminary Analysis
- Major Analysis
- Conclusion

ANALYSIS AND INTERPRETATION

Analysis of data is the heart of research report (Best, 1983) Data analysis is the process of extracting information from data. Analysis means categorizing, ordering, manipulating and summarizing of data to obtain answer to research question. It involves breaking down, the existing complex factor into simple parts and putting the parts together in new arrangements for the purpose of interpretation. Interpretation is the process for establishing relationship between variables, the usefulness of the collected data lies in its proper interpretation. It is the most important step in the total procedure of research. Analysis of data means studying the organized material in order to discover inherent facts. The data was studied from as many angles as possible to explore new facts. Statistical techniques have contributed greatly in gathering, organizing, analyzing and interpreting numerical data. (Koul, 2014)

The main purpose of the present study is to find out the extent of techno-pedagogical skill in secondary school teachers of Calicut district. This chapter describes the details of the statistical analysis of the data collected. The collected data were analyzed statistically on the basis of the objectives of the study and the results are presented and discussed in this chapter.

Objectives of the Study

The objectives of the study are:

1. To find out the extent of Techno-Pedagogical skill among secondary school teachers in Calicut district for the total sample and related subsamples based on gender and Educational qualification.

2. To find out whether there exist any significant difference between the mean scores of techno-pedagogical skill of secondary school teachers on the sub samples based on:

   - Gender
   - Educational Qualification.

3. To evaluate the status of techno-pedagogic culture among the secondary schools of Calicut district

Hypotheses of the Study

The present study is designed to test the following hypotheses.

1. There exists no significant difference in techno-pedagogical skill among secondary school teachers in the sub sample based on gender.

2. There exists no significant difference in techno-pedagogical skill among secondary school teachers in the sub sample based on qualification

Preliminary Analysis

Before starting up with major statistical analysis, the investigator studied the nature of the distribution of the variables in the study. Data was collected from 300 secondary school teachers in Calicut district. The scores obtained were subjected to preliminary analysis with a view to apply further statistical procedure. The major statistical constants such as Mean, Median, Mode, Skewness and Kurtosis of variables were calculated.

The results of descriptive statistics for the distribution of scores for techno-pedagogical skill of secondary school teachers for total sample is calculated and presented in Table 6 followed by figure 2.

Table 6: *Mean Median, Mode, Skewness and Kurtosis of Techno-pedagogical skill for the total sample*

Variables	Number	Mean	Median	Mode	SD	Skewness	Kurtosis
Techno-pedagogical skill of teachers	300	161.82	163.00	163.00	24.09	-0.15	-0.14

Figure 2: Graphical representation of the distribution of scores of Techno-pedagogical skill for the total sample.

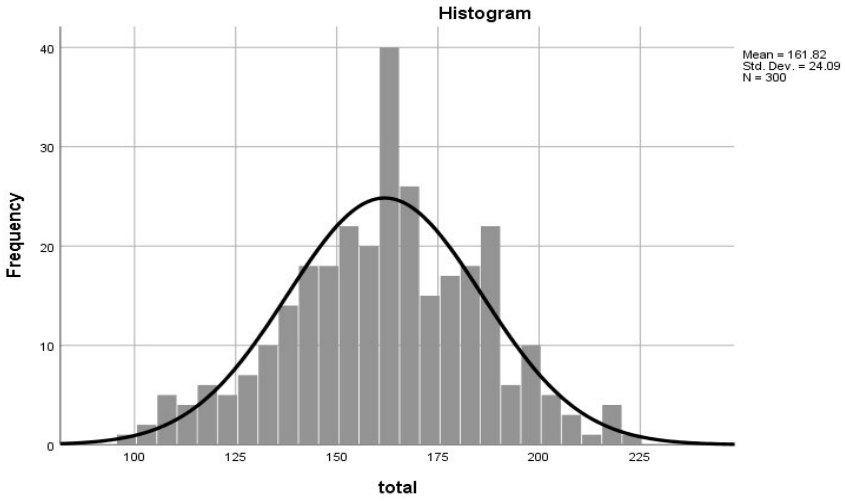

Table 6 and figure 2 shows that the obtained value of mean, median and mode of the variable, the techno-pedagogical skill of secondary school teachers are 161.82,163 and 163 respectively for the total sample. It indicates that the value of Mean, Median and mode coincide approximately for the total sample. The value of skewness (sk = -0.15) show that the distribution of the scores of Techno-pedagogical skill of the secondary school teachers are negatively skewed for the total sample. The value of kurtosis for techno-pedagogical skill reveals that the distribution of scores of Techno-pedagogical skill (K=0.14) is Mesokurtic in nature for the total sample of the secondary school teachers. Hence the score of techno-pedagogical skill of secondary school teachers keep normality in its distribution.

Major Analysis

To analyse the extend of techno-pedagogical skills of secondary school teachers, percentage analysis were done and to find out the significant difference in

the mean scores of techno-pedagogical skills between sub samples 't' test were administered. The details of analysis and interpretations as follows.

The Extent of Techno-Pedagogical Skill of Teachers for the Total Sample

In order to find out the extent of techno-pedagogical skill, mean and standard deviation were computed for the total sample. The total number of teachers was classified as high group, moderate group and low group based on the following criteria.

Mean + 1SD = High group

Mean – 1SD= low group

Between High and Low = Moderate group

Number of teachers in each category and the percentage of responses are given in table 7 followed by figure 3

Table 7: *Techno-pedagogical skill among secondary school teachers for the total sample*

	Group	Number	Percentage %
Mean =161.82 SD =24.09	High	54	18
	Moderate	202	67.33
	Low	44	14.67
	Total	300	100

Figure 3: Pie diagram to show extent of Techno-pedagogical skill among secondary school teachers for the total sample

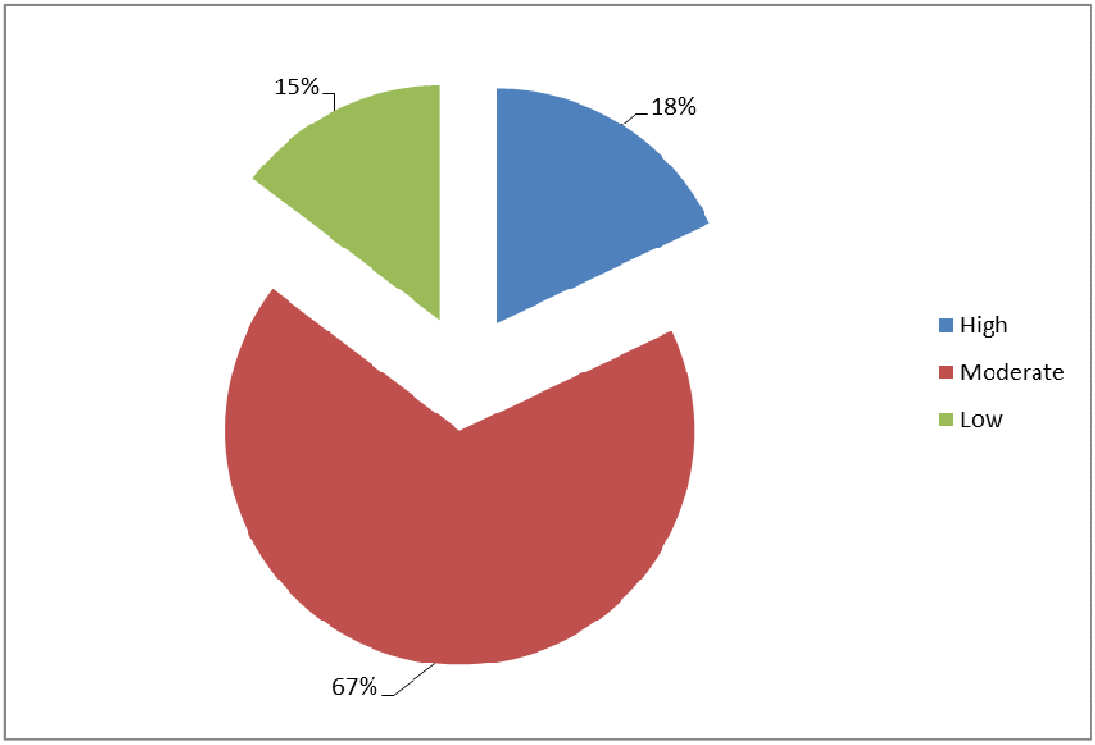

Table 7 and figure 3 shows that out of 300 teacher's 54 teachers are having high level of Techno-Pedagogical Skill. Majority of Teachers, that is 202 out of 300, are in moderate group and 44 teachers are having low level of Techno-Pedagogical Skill. It reveals that 67.33% of Total teachers are having moderate Techno-Pedagogical skill. While 18% is having high level of techno-pedagogical skill and 14.67 % is having low level of techno-pedagogical skill.

The Extent of Techno-Pedagogical Skill of Teachers for the Relevant Subsamples Based On Gender

In order to find out the extent of techno-pedagogical skill, mean and standard deviation were computed for the relevant subsamples based on gender. The total

number of teachers was classified as high group, moderate group and low group based on the following criteria.

Mean + 1SD = High group

Mean – 1SD= low group

Between High and Low = Moderate group

Number of male teachers in each category and the percentage of responses are given in table 8 followed by figure 4 and number of female teachers in each category and the percentage of responses are given in table 9 followed by figure 5

Table 8: *Extent of Techno-pedagogical skill among male teachers for relevant subsamples based on gender*

	Group	Number	Percentage %
Mean =163.13 SD =25.28	High	27	18
	Moderate	101	67.33
	Low	22	14.67

Figure 4: Pie diagram to show extent of Techno-pedagogical skill among male teachers for relevant subsamples based on gender

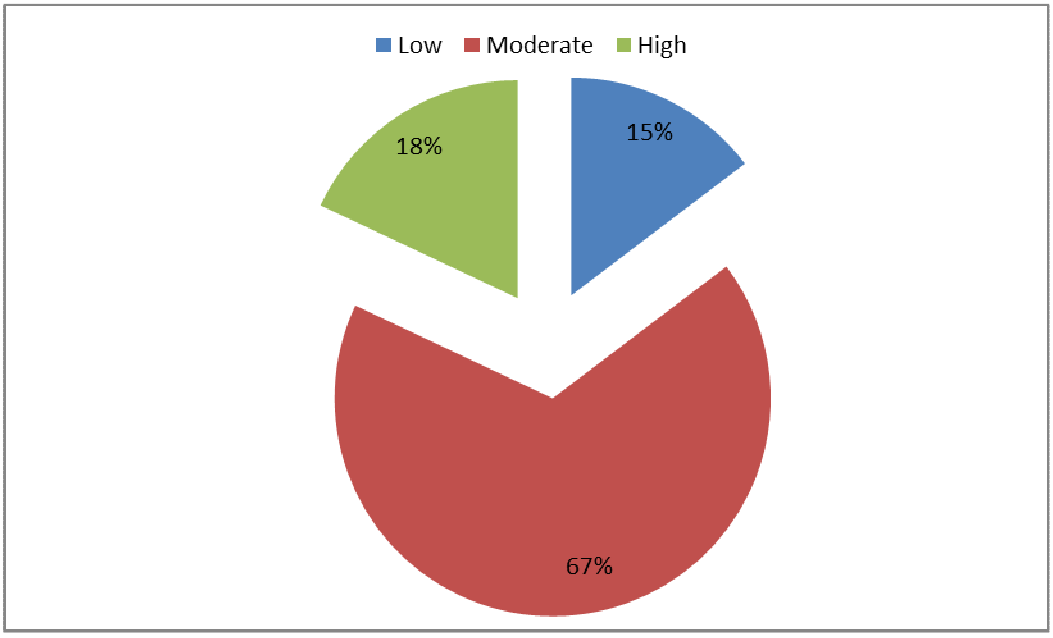

Table 8 and figure 4 shows that out of 150 male teacher's 27 teachers are having high level of Techno-Pedagogical Skill. Majority of male Teachers, that is 101out of 150, are in moderate group and 22 male teachers are having low level of Techno-Pedagogical Skill. It reveals that 67.33% of male teachers are having moderate Techno-Pedagogical skill. While 18% is having high level of techno-pedagogical skill and 14.67 % is having low level of techno-pedagogical skill.

Table 9: *Extent of Techno-pedagogical skill among female teachers for relevant subsamples based on gender*

	Group	Number	Percentage %
Mean =160.51 SD =22.84	High	23	15.33
	Moderate	105	70
	Low	22	14.67

Figure 5: Pie diagram to show extent of Techno-pedagogical skill among female teachers for relevant subsamples based on gender

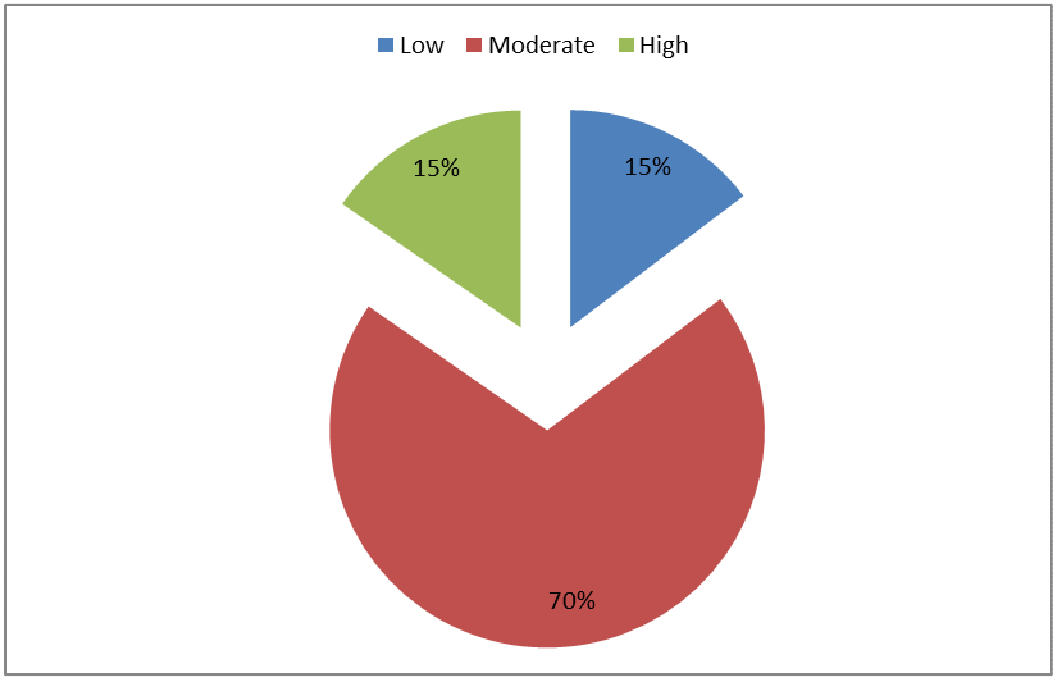

Table 9 and figure 5 shows that out of 150 female teacher's 23 teachers are having high level of Techno-Pedagogical Skill. Majority of female Teachers, that is 105 out of 150, are in moderate group and 22 female teachers are having low level of Techno-Pedagogical Skill. It reveals that 70% of female teachers are having moderate Techno-Pedagogical skill. While 15.33% is having high level of techno-pedagogical skill and 14.67 % is having low level of techno-pedagogical skill.

The Extent of Techno-Pedagogical Skill for the Subsamples Based On Educational Qualification

In order to find out the extent of techno-pedagogical skill, mean and standard deviation were computed for the relevant subsamples based on Educational

qualification. The total number of teachers was classified as high group, moderate group and low group based on the following criteria.

Mean + 1SD = High group

Mean – 1SD= low group

Between High and Low = Moderate group

Number of graduate teachers in each category and the percentage of responses are given in table 10 followed by figure 6 and number of postgraduate teachers in each category and the percentage of responses are given in table 11 followed by figure 7

Table 10: *Extent of Techno-pedagogical skill among Graduate teachers for relevant subsamples based on Education Qualification*

	Group	Number	Percentage %
Mean =160.26 SD =24.08	High	26	17.33
	Moderate	99	66
	Low	25	16.67

Figure 6: Pie diagram to show extent of Techno-pedagogical skill among graduate teachers for relevant subsamples based on Educational Qualification

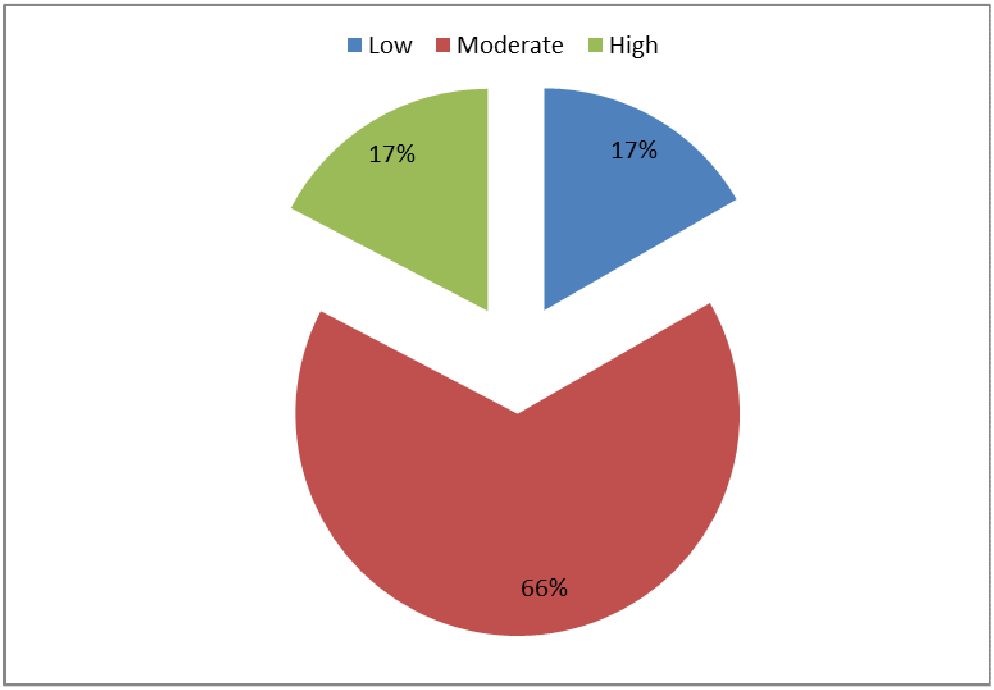

Table 10 and figure 6 shows that out of 150 graduate teacher's 26 teachers are having high level of Techno-Pedagogical Skill. Majority of graduate Teachers, that is 99 out of 150, are in moderate group and 25 graduate teachers are having low level of Techno-Pedagogical Skill. It reveals that 66% of graduate teachers are having moderate Techno-Pedagogical skill. While 17.33% is having high level of techno-pedagogical skill and 16.67 % is having low level of techno-pedagogical skill.

Table 11: *Extent of Techno-pedagogical skill among Postgraduate teachers for relevant subsamples based on Education Qualification*

	Group	Number	Percentage %
Mean =163.26 SD =24.09	High	27	18
	Moderate	101	67.33
	Low	22	14.67

Figure *7: Pie diagram to show extent of Techno-pedagogical skill among postgraduate teachers for relevant subsamples based on Educational Qualification*

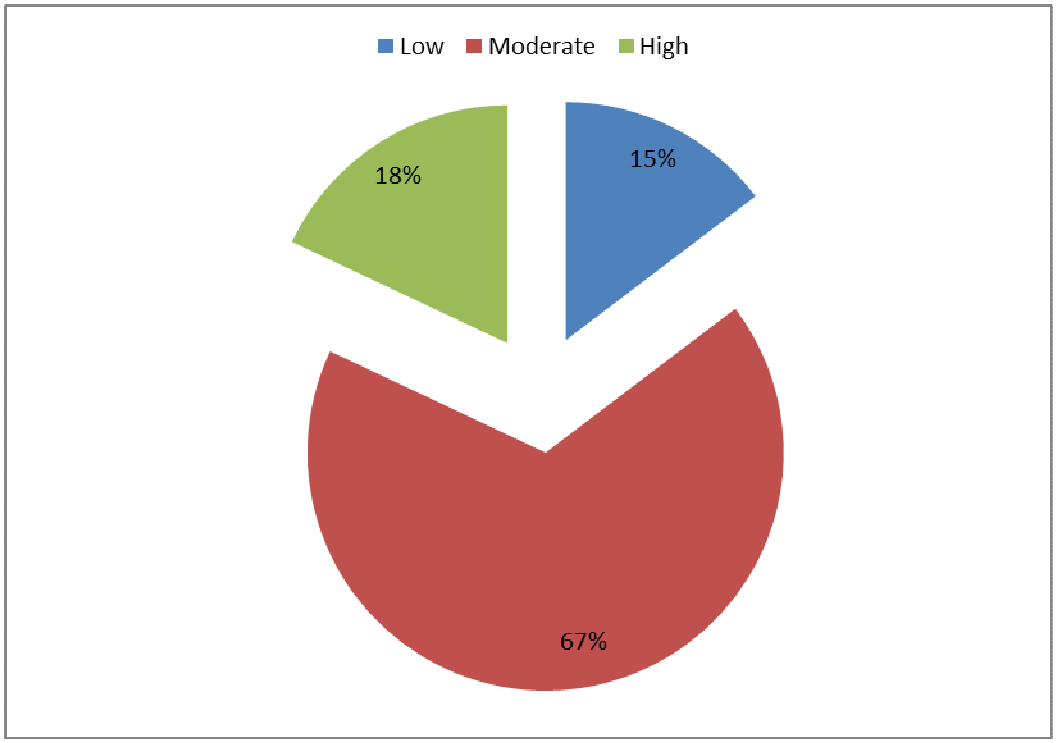

Table 11 and figure 7 shows that out of 150 postgraduate teacher's 27 teachers are having high level of Techno-Pedagogical Skill. Majority of post graduate Teachers that is 101 out of 150 are in moderate group and 22 post graduate teachers are having low level of Techno-Pedagogical Skill. It reveals that 67.33% of

post graduate teachers are having moderate Techno-Pedagogical skill. While 18% is having high level of techno-pedagogical skill and 14.67 % is having low level of techno-pedagogical skill.

Comparison of the Mean Scores of Techno-Pedagogical Skill With Respect To Gender

To find out the difference in Techno-pedagogical skill of secondary school teachers, with respect to gender the test of significance of difference between the mean scores of large independent sample is applied. The data and results of the test of significance difference between the mean scores of Techno-pedagogical skill for Male and Female secondary schools Teachers are presented in Table 12

Table 12: *Mean, Standard Deviation (SD) and t-Value of Techno-pedagogical skill based on Gender*

Gender	N	Mean	SD	t-value	Level of significance
Female	150	160.51	22.84	0.94	Not Significant
Male	150	163.13	25.28		

Table 12 shows that the mean scores of Techno-pedagogical Skill of male secondary Teachers are 163.13 and the mean scores of Techno-pedagogical Skill of female secondary Teachers are 160.51. The standard deviation obtained for male Teachers are 25.28 and female students are 22.84. The t-value obtained is 0.94, which is less than the tabled value at 0.05 level (1.96). Since the t-value obtained is less than the tabled value, it can be concluded there exists no significant difference

in the mean scores of Techno-pedagogical Skill of male and female secondary school Teachers.

The mean scores of Techno-pedagogical Skill of male and female secondary school Teachers were analyzed. It was found that there is no significant difference in the mean scores of Techno-pedagogical Skill of male and female secondary school Teachers. So it can be concluded that male and female secondary school Teachers have the same level of Techno-pedagogical Skill.

Comparison of the Mean Scores of Techno-Pedagogical Skill With Respect To Educational Qualification

To find out the difference in Techno-pedagogical skill of secondary school teachers, with respect to Educational qualification the test of significance of difference between the mean scores of large independent sample is applied. The data and results of the test of significance difference between the mean scores of Techno-pedagogical skill for Graduate and Post Graduate secondary schools Teachers are presented in Table 13

Table 13: *Mean, Standard Deviation (SD) and t-Value of Techno-pedagogical skill based on Educational Qualification*

Gender	N	Mean	SD	t-value	Level of significance
Graduate	150	160.39	24.08	1.03	Not Significant
Post Graduate	150	163.26	24.096		

Table 13 indicates that the mean scores of Techno-pedagogical Skill of Graduate secondary Teachers are 160.39 and the mean scores of Techno-pedagogical Skill of Post Graduate secondary Teachers are 163.26. The standard deviation obtained for Graduate Teachers are 24.08 and Post Graduate students are 24.096. The t-value obtained is 1.03, which is less than the tabled value at 0.05 levels (1.96). Since the t-value obtained is less than the tabled value, it can be concluded there exists no significant difference in the mean scores of Techno-pedagogical Skill of Graduate and Post Graduate secondary school Teachers.

The mean scores of Techno-pedagogical Skill of Graduate and Post Graduate secondary school Teachers were analyzed. It was found that there is no significant difference in the mean scores of Techno-pedagogical Skill of Graduate and Post Graduate secondary school Teachers. So it can be concluded that Graduate and Post Graduate secondary school Teachers have same level of Techno-pedagogical Skill.

Descriptive Analysis Based on Interview Schedule

By analyzing the information collected from Head of the secondary schools, it was found that the teachers are being trained in the use of technologies. The teachers of secondary schools are utilizing the recourses provided to them. The additional study materials available on line are being downloaded by teachers and are being utilized for the healthy teaching learning process.

The government of the state has been providing the facilities for both aided and government schools. In almost all schools visited, the teachers and the head of the institution are happy with the facilities available .The teachers of the rural

section are getting extra help from the authorities to get accustomed with the facilities provided to them. The DIET (District Institute For Education and Training), BRC, URC through IT@school program are providing training programs for teachers and resource personals for the full-fledged and smooth running of the teaching learning process.

Some of the H.M's have mentioned that all the teachers are not fully utilizing the resources due to the fear of damaging the resource at the beginning, but after getting proper training the teachers are using the resource well. All teachers have e-mail ids and are encouraged to submit online lesson plan. Almost all the teachers are using the audio visual materials to make their class interesting for the students.

Despite all the training and extra classes provide by the school and authorities there are some teachers who are reluctant to change and use the technologies for the fullest. There are some who are not using the technologies because of heavy strength in the classroom. Some old teachers take help of the well trained teachers for the smooth running of the classes. But there are some who are very reluctant to use the technology and still running the old lecture method of teaching.

In Every school there is a teacher who is well trained in the usage of all the electronic equipments and is approached by all the teachers for help. The trained teacher is given the charge to update the software, do the yearly maintenance of the equipments.

Majority of head of the schools are satisfied with the usage of the technology by the teachers. Almost all the schools are publishing e-magazines with the help of IT club. The students are selected for the club after conducting a written examination to select the best ones .The government of Kerala is providing all help to increase the use of technology and the smooth running of the program.

Conclusion

Analysis of the data revels that the extent of Techno-Pedagogic Skill is satisfactory in total sample and the subsample based on Gender and Educational Qualification. By the comparison of the mean scores of Techno-Pedagogical Skill it is revealed that there exists no significant difference in mean scores with respect to Gender, and Qualification among Secondary school teachers of Calicut District. Analysis of the data based on the interview schedule, on the status of techno-pedagogic culture among the secondary schools of Calicut district, the investigator has come to a conclusion that the schools are utilizing the technology at maximum level for the smooth and efficient Teaching learning process.

Chapter V

SUMMARY, FINDINGS, CONCLUSION AND SUGGESTIONS

- Study in retrospect
- Major findings
- Tenability of hypotheses
- Conclusion
- Educational implications of the study
- Suggestions for further research

SUMMARY, FINDINGS, CONCLUSION AND SUGGESTIONS

This chapter contains a summary of the study includes, major findings of the study, conclusion, tenability of hypotheses educational implications and suggestions for further research. This provides an overview of the significant aspects of the various stages of the study.

The Study in Retrospect

The various aspects in the different stages of the present investigation like the statement of the problem, variable, objectives, hypotheses, methodology etc are given in retrospect.

Restatement of the Problem

The present study is entitled as "**Techno-Pedagogical Skill among Secondary School Teachers In Calicut District."**

Variable of the study

The only variable in the present study is Techno-pedagogical skill of secondary school teachers.

Objectives of the Study

The objectives of the study are:

1. To find out the extent of Techno-Pedagogical skill among secondary school teachers

in Calicut district for the total sample and relevant subsamples based on gender and Educational qualification.

2. To find out whether there exist any significant difference between the mean scores of techno-pedagogical skill of secondary school teachers on the sub samples based on:

   - Gender
   - Educational Qualification.

3. To evaluate the status of techno-pedagogic culture among the secondary schools of Calicut district

Hypotheses of the Study

The present study is designed to test the following hypotheses.

1. There exists no significant difference in techno-pedagogical skill among secondary school teachers in the sub sample based on gender.

2. There exists no significant difference in techno-pedagogical skill among secondary school teachers in the sub sample based on qualification

Methodology

The present study is intended to know about the Techno-pedagogical skill of secondary school teachers. And hence survey method was used for the conduction of the study.

Sample

The present study was conducted on a sample of 300 secondary school teachers and 20 head of the schools from Calicut district in Kerala State.

Tool used for data collection

Scale on Techno-pedagogical skill and interview schedule was used for the data collection. The tools are constructed by the investigator with the help of supervising teacher.

Statistical techniques Used for the study

The investigator carried out percentage analysis and t-test to analyze the data and reach in to the findings.

Major Findings of the Study

Evaluating all the findings obtained by analyzing the data major findings can be summarized as follows:

1. Out of 300 teacher's 54 teachers are having high level of Techno-Pedagogical Skill, which reveals that only 18% teachers are having high Techno-Pedagogical Skill.67.33% ,that is majority of teachers are coming under moderate level in their techno-pedagogical skill.

2. Out of 150 male teacher's 27 teachers are having high level of Techno-Pedagogical Skill. Majority of male Teachers, that is 101out of 150, are in moderate group and 22 male teachers are having low level of Techno-

Pedagogical Skill. It reveals that 67.33% of male teachers are having moderate Techno-Pedagogical skill.

3. Out of 150 female teacher's 23 teachers are having high level of Techno-Pedagogical Skill. Majority of female Teachers, that is 105out of 150, are in moderate group and 22 female teachers are having low level of Techno-Pedagogical Skill. It reveals that 70% of female teachers are having moderate Techno-Pedagogical skill

4. Out of 150 graduate teacher's 26 teachers are having high level of Techno-Pedagogical Skill. Majority of graduate Teachers, that is 99 out of 150, are in moderate group and 25 graduate teachers are having low level of Techno-Pedagogical Skill. It reveals that 66% of graduate teachers are having moderate Techno-Pedagogical skill.

5. Out of 150 post graduate teacher's 27 teachers are having high level of Techno-Pedagogical Skill. Majority of post graduate Teachers that is 101 out of 150 are in moderate group and 22 post graduate teachers are having low level of Techno-Pedagogical Skill. It reveals that 67.33% of post graduate teachers are having moderate Techno-Pedagogical skill.

6. There is no significant difference in the mean scores of Techno-pedagogical Skill of male and female secondary school Teachers. ($t=0.94$, $P>0.05$)

7. There is no significant difference in the mean scores of Techno-pedagogical Skill of graduate and post graduate secondary school Teachers. ($t=1.03$, $P>0.05$)

8. From the interview schedule on the status of techno-pedagogic culture among the secondary schools of Calicut district, the investigator has come to a conclusion that the schools are utilizing the technology at its fullest for the smooth and efficient Teaching learning process.

Tenability of hypothesis

The first hypothesis states that there exists no significant gender difference in the mean scores of techno-Pedagogical skill of secondary school teachers. The result showed that there is no significant difference in the mean scores of Techno-Pedagogical skill among secondary school teachers with respect to gender. Thus, the first hypothesis is accepted.

The second hypothesis states that there exists no significant Qualification difference in the mean scores of techno-Pedagogical skill of secondary school teachers. The result showed that there is no significant difference in the mean scores of Techno-Pedagogical skill among secondary school teachers with respect to educational qualification. Thus, the second hypothesis is also accepted.

Conclusion

By the study it is evident that the techno-pedagogical skill of secondary school teachers falls in the moderate level group. From the findings it is clear that Techno-Pedagogical skill of secondary school teachers are not differ on the subsamples of gender, Educational Qualification. Analysis of the data based on the interview schedule on the status of techno-pedagogic culture among the secondary schools of Calicut district, the investigator has come to a conclusion that the schools

are utilizing the technology at its fullest for the smooth and efficient Teaching learning process.

Educational Implications of the study

The value of any piece of research lies in the implication of study. The present study conducted with a view to find out the extent of Techno-Pedagogical skill among secondary school teachers in Calicut district, the result of the present study has various implications in educational field which help policy makers and educationalist in their attempt to enhance quality of education in Kerala.

- Proper in-service IT training programme should be organized for teachers which may provide sufficient knowledge and skill in IT. Teacher training should be equipped with latest TPACK strategy and opportunities must be provided for hands on experience .Teacher training programs should provide proper training program in development of ICT in education and management. So orientation programme is must for the experienced and non experienced teachers, so that teachers can get exposed to the field of educational technology.

- Lack of infrastructure in some of the schools is a dampener. Almost all schools do have computers but some of them lack the bandwidth. Government providing ICT facilities especially rural schools, but many cases them not working properly. Schools must strongly implement IT @ school functions by providing IT labs .1t create better understanding of Quality Assurance among teachers.

- The funds from both state and central ministry are very useful for the development of ICT facilities at schools

- Use ICT selectively and appropriately to enliven the teaching process, to motivate students and to achieve positive attitudes to learning. The teacher is like gardener who tends to protect flowers (students) and shapes them into market able Products. In a rapidly changing society both teacher and students are explorers. So digital basic skills provide capabilities to adopt change.

- Selecting software for use during whole class teaching-learning activities ,teacher will need to become familiar with appropriate software to be used in each lesson Most of the time teachers installing learning technology without reviewing Student needs and content availability. 1t producing low quality content that has poor instructional design and is not adapted to technology in use .So teachers consider themselves life-long learners and skilled learners .As professionals they require to continue studying and improving their craft. Teacher should go into the class not only for teaching but also for learning.

- In the 21st century education, focus is on relationship between teachers beliefs, knowledge and pedagogic practice in the process of developing and adopting new knowledge and skills. We must consider the impact of technology and changing face of curriculum. So must introduce need based and advanced concepts in teaching for enabling teachers to develop and use ICT skills in attainment of curriculum learning objectives.

- The paradigm of learning has shifted from traditional paper and pen method of teaching and learning with ‘sage on the stage’ replaced with the technologies that boost the same pedagogical advantages as traditional teaching methods but with more advanced learning which can be done at any place or any time. So instructors must implement blogging technology in their class room to help students articulate and share their learning with peers and experts.

- ICT have become a driving force of educational reform. So it must an integrative part of National Educational Policies and Plans. Policy makers must give strong attention for making 1T enabled curriculum in the educational system.

- Some teachers do not have personal computers to develop their skill in IT. Authorities are to make provisions for teachers who do not have personal matters for developing their techno-pedagogical skill in teaching .It helps to develop teachers basic awareness regarding lCT, hardware ,software, internet, memory devices and programming.

- Teachers should been encourage to use online and internet facilities for getting access of various knowledge resources and for enhancing professionally which will develop their skills to work on with confidence.

- Teachers with higher teaching experience find to have lesser level of Techno-pedagogical skill. Hence senior teachers must be given more opportunities to develop their skill.

- Language teacher are reluctant to use the technology and should be encouraged to use it more than subject teachers.

Suggestions for further research

The findings of the study and limitations encountered in the present study helped the investigator to suggest the following for further research. The study can be conducted at various levels such as higher secondary, graduate and post graduate level etc.

- The present study can be extended to other district of the states.
- Study can be conducted on language and subject teacher's techno-pedagogical skill separately.
- Study can be conducted on the teachers implementation of M-learning and smart learning strategies for students.
- Study in creation of virtual classroom environment and how it reaches out to more students who require aid.
- Techno-pedagogical skills of college teachers can be studied.
- Learning packages and modules to improve thinking skills can be developed.
- Creative Thinking Skill is an area lacking in students. So ICT based learning packages to improve critical thinking skill can be made.
- Influence of techno-pedagogical skills on teaching competency of teacher trainees can be studied.

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APPENDICES

Appendix I

FAROOK TRAINING COLLEGE, CALICUT

Techno – Pedagogical Skill Assessment Scale
(Draft)

Dr. T. Mohammed Saleem
Associate Professor.
(Supervising Teacher)

Surabhila. T. R.
M. Ed. Student

Direction:

A few statements regarding Techno – Pedagogical Skill usage is given below. Please read carefully every statement and give your response in the appropriate column using tic mark. Please note that only one response cold be selected at a time. We assure you that the details given you will be used for research purpose only and will not be shared with anyone else.

Serial No.	Statement	Always	Often	Sometimes	Rarely	Never
1	I, Used to log on to the **Samagra Resource Portal** and use its **contents** in the class					
2	I, Used to encourage the students to submit online assignments					
3	I, Used to help the students to use computer wallpapers to prepare Projects					
4	I can prepare the mark list of my students using MS Excel sheet					
5	To prepare and publish the Grade of my students I use Excel sheet					
6	I am able to enlighten my students on Cyber crimes					
7	I, Used to train my students to download files from internet and to save them					
8	To improve my communication, I Use the E-Language Library					
9	I, Used to give assignments to my students using **Google Class Room Tools** and ensure its submission					

Serial No.	Statement	Always	Often	Sometimes	Rarely	Never
10	I, Used to submit applications online					
11	I, Used to help students preparation of online Portfolio					
12	I, Used to help children to download materials for bulletin board from internet					
13	I, Used to prepare the question papers using MS word					
14	I, Used to sent progress reports of students to the parents through e-mail					
15	I, Used to encourage students to prepare power point presentation and send it online					
16	I, Used to encourage students to listen audio lessons					
17	I have taken membership in various forums connected with my subjects to improve my class					
18	I, Used to check my e-mail account every day					
19	I, Used to download E-textbook from textbook for Kerala syllabus mobile application for the use in class room					
20	I, Used to update the downloaded materials kept in my drive, regularly					
21	I, have full confidence to use smart classroom in teaching					
22	I am able to handle class using any type of LCD projectors					
23	I have the capacity to prepare Spread Sheet					
24	I can prepare Graff/Diagram on the performance of students using computer					
25	I, Used to help students in healthy Internet Browsing					
26	I, Used to send group messages, after collecting e-mail Id of students and Parents					
27	I often find time to visit on line libraries					

Serial No.	Statement	Always	Often	Sometimes	Rarely	Never
28	I, Used to download materials connected with my subject from the internet					
29	To prepare lesson note for the class, I use the contents form the mobile applications like Selfie of the SIET					
30	I can take classes using Laptop.					
31	I am able to take printouts of Power Point Presentation to use as handouts					
32	I, Used to encourage students to attend online Examinations					
33	I, Used to encourage the students to watch the online tutorials on the topics learned in the class					
34	I, Used to help them to download materials for Seminars					
35	I, Used to teach students to make their e-mail Id and to send and receive mails					
36	I, Used to read the Blogs and Tweets connected with my topic and assimilate it.					
37	I, Used to give printouts of the notes prepared by me					
38	I, Use the Electronic Encyclopaedia for teaching					
39	I, Used to download and keep saved the necessary video lessons from the YouTube					
40	I can take classes using online tutorial platform					
41	I, Used to upload materials connected with my topic as E-Contents to Samagra					
42	I, Used to conduct small online tests for the Students					
43	I, Used to prepare question banks using ICT facilities and make use of them					
44	To make the classroom learning interesting, I use videos connected with the topic					

Serial No.	Statement	Always	Often	Sometimes	Rarely	Never
45	I, Use the Video conference facility to my views when available					
46	I, Use the online facilities in the lesson planning					
47	I, Used to submit the lesson plan as E-Contents to the Head Master/ Principal					
48	I, Used to conduct attractive learning sessions with the help of Social Networking Media.					
49	As a teacher, I have the knowledge to use the multimedia facilities in the classroom					
50	I, Used to sent the Audio-Video files connected with the topics to my associates					

Appendix II

FAROOK TRAINING COLLEGE, CALICUT
Techno-Pedagogical Skill Assessment Scale
(Draft)

Dr. T. Mohamed Saleem
Associate Professor
(Supervising Teacher)

Surabhila.T.R
M.Ed. Student

നിർദ്ദേശങ്ങൾ

Techno - Pedagogical Skill മായി ബന്ധപ്പെട്ട് ഏതാനും പ്രസ്താവനകളാണ് താഴെ കൊടുത്തിരിക്കുന്നത് ഓരോ പ്രസ്താവനയും ശ്രദ്ധാപൂർവ്വം വായിച്ച് തന്നിരിക്കുന്ന പ്രതികരണ പേജിൽ.....ഉപയോഗിച്ച് നിങ്ങളുടെ പ്രതികരണങ്ങൾ രേഖപ്പെടുത്തുക. ഒരു പ്രസ്താവനയ്ക്ക് ഒരു പ്രതികരണം മാത്രമേ രേഖപ്പെടുത്താവൂ. നിങ്ങൾ നൽകുന്ന വിവരങ്ങൾ വളരെ രഹസ്യമായി സൂക്ഷിക്കുന്നതാണെന്നും ഗവേഷണാവശ്യത്തിനു മാത്രമേ ഉപയോഗിക്കുകയുള്ളൂ എന്നും ഉറപ്പുനൽകുന്നു.

ക്രമ നമ്പർ	പ്രസ്താവന	എല്ലായിപ്പോഴും	മിക്കപ്പോഴും	ചിലപ്പോഴും	അപൂർവ്വമായി	ഒരിക്കലുമില്ല
1.	സമഗ്ര റിസോഴ്സ് പോർട്ടൽ ഞാൻ സ്ഥിരമായി സന്ദർശിക്കുകയും അതിലെ Content-കൾ ക്ലാസ്സിൽ ഉപയോഗിക്കാറുമുണ്ട്.					
2.	ഓൺലൈൻ അസൈൻമെന്റ് സബ്മിറ്റ് ചെയ്യാൻ ഞാൻ കുട്ടികളെ പ്രോത്സാഹിപ്പിക്കാറുണ്ട്					
3.	കമ്പ്യൂട്ടർ വാൾപേപ്പറുകൾ ഉപയോഗിച്ച് പ്രോജക്ട് തയ്യാറാക്കുന്നതിന് ഞാൻ എന്റെ കുട്ടികളെ സഹായിക്കാറുണ്ട്					
4.	എന്റെ ക്ലാസ്സിലെ കുട്ടികളുടെ മാർക്ക് ലിസ്റ്റ് ഞാൻ എം.എസ്. എക്സൽ ഉപയോഗിച്ച് തയ്യാറാക്കി ഉപയോഗിച്ചുവരുന്നു.					
5.	പരീക്ഷയിൽ കുട്ടികളുടെ പ്രകടനങ്ങളുടെ ഗ്രേഡ് തയ്യാറാക്കാനും പ്രദർശിപ്പിക്കാനും എക്സൽ ഷീറ്റ് ഞാൻ ഉപയോഗിക്കാറുണ്ട്.					

ക്രമ നമ്പർ	പ്രസ്താവന	എല്ലായ്പ്പോഴും	മിക്കപ്പോഴും	ചിലപ്പോഴും	അപൂർവ്വമായി	ഒരിക്കലുമില്ല
6.	സൈബർ കുറ്റകൃത്യങ്ങളെ കുറിച്ച് എന്റെ വിദ്യാർത്ഥികളെ ബോധവൽക്കരിക്കാൻ എനിക്ക് സാധിക്കാറുണ്ട്					
7.	ഇന്റർനെറ്റിൽ നിന്നും എങ്ങനെ ഫയലുകൾ ഡൗൺലോഡ് ചെയ്യണമെന്നും അവ എങ്ങനെ ഡ്രൈവിലേക്ക് സേവ് ചെയ്യണം എന്നും എന്റെ കൂട്ടികളെ ഞാൻ പരിശീലിപ്പിക്കാറുണ്ട്.					
8.	എന്റെ ആശയവിനിമയ വൈദഗ്ധ്യം മെച്ചപ്പെടുത്താൻ ഞാൻ E- ഭാഷ ലൈബ്രറി ഉപയോഗിക്കാറുണ്ട്.					
9.	ഗൂഗിൾ class room tools ഉപയോഗിച്ച് കുട്ടികൾക്ക് അസൈൻമെന്റ് കൊടുക്കാനും അതിന്റെ സബ്മിഷൻ ഉറപ്പുവരുത്താനും ഞാൻ ശ്രമിക്കാറുണ്ട്.					
10.	Online അപേക്ഷകൾ പൂരിപ്പിച്ച് ഞാൻ സമർപ്പിക്കാറുണ്ട്.					
11.	Online പോർട്ട് പോളിയോ തയ്യാറാക്കാൻ കുട്ടികളെ സഹായിക്കാറുണ്ട്.					
12.	ബുള്ളറ്റിൽ ബോർഡിലേക്കുള്ള മെറ്റീരിയലുകൾ ഇന്റർനെറ്റിൽനിന്നും ഡൗൺലോഡ് ചെയ്യാൻ കുട്ടികളെ ഞാൻ സഹായിക്കാറുണ്ട്.					
13.	ഞാൻ എം.എസ് വേർഡ് ഉപയോഗിച്ചാണ് ചോദ്യപേപ്പർ തയ്യാറാക്കുന്നത്					
14.	വിദ്യാർത്ഥികളുടെ പുരോഗതി റിപ്പോർട്ട് തയ്യാറാക്കി ഇ-മെയിലിൽ രക്ഷാകർത്താക്കൾക്ക് അയച്ചുകൊടുക്കാൻ എനിക്ക് സാധിക്കാറുണ്ട്.					
15.	സ്വന്തമായി power point presentation തയ്യാറാക്കി അത് ഓൺലൈനായി സബ്മിറ്റ് ചെയ്യാൻ ഞാൻ കുട്ടികളെ പ്രോത്സാഹിപ്പിക്കാറുണ്ട്.					
16.	വിദ്യാർത്ഥികളെ ഓഡിയോ ലെൻസ് കേൾക്കാൻ ഞാൻ പ്രോത്സാഹിപ്പിക്കാറുണ്ട്.					

ക്രമ നമ്പർ	പ്രസ്താവന	എല്ലായിപ്പോഴും	മിക്കപ്പോഴും	ചിലപ്പോൾ	അപൂർവ്വമായി	ഒരിക്കലുമില്ല
17.	ക്ലാസ്സ് മെച്ചപ്പെടുത്താനായി എന്റെ വിഷയ വുമായി ബന്ധപ്പെട്ട വിവിധ ഫോറങ്ങളിൽ മെമ്പർഷിപ്പ് എടുത്തിട്ടുണ്ട്.					
18.	ഞാൻ എന്റെ ഇ-മെയിൽ അക്കൗണ്ട് ദിവ സവും നോക്കാറുണ്ട്.					
19.	ടെക്സ്റ്റ് ബുക്ക് ഫോർ കേരള സിലബസ് പോലുള്ള മൊബൈൽ ആപ്ലിക്കേഷനിൽ നിന്നും E- ടെക്സ്റ്റ് ബുക്ക് ഡൗൺലോഡ് ചെയ്ത് ഞാൻ ഉപയോഗിക്കാറുണ്ട്.					
20.	ഡൗൺലോഡ് ചെയ്ത് മെറ്റീരിയലുകൾ ഞാൻ എന്റെ ഡ്രൈവിൽ സ്ഥിരമായി അപ്ഡേറ്റ് ചെയ്യാറുണ്ട്.					
21.	അദ്ധ്യാപനത്തിൽ സ്മാർട്ട് ക്ലാസ് റൂം ഉപ യോഗിക്കാൻ എനിക്ക് ആത്മവിശ്വാസമു ണ്ട്.					
22.	ഏതുവിധത്തിലുള്ള എൽ.സി.ഡി. പ്രൊജ ക്ടറുകൾ ഉപയോഗിച്ചും ക്ലാസ്സ് എടുക്കാൻ എനിക്കറിയാം.					
23.	Spread sheet തയ്യാറാക്കാനുള്ള നൈപുണ്യം എനിക്കുണ്ട്					
24.	Computer ഉപയോഗിച്ച് കുട്ടികളുടെ പ്രകട നത്തിന് ഗ്രാഫ്/ഡയഗ്രം എന്നിവ തയ്യാറാ ക്കാൻ എനിക്ക് സാധിക്കാറുണ്ട്.					
25.	ആരോഗ്യകരമായ ഇന്റർനെറ്റ് ബ്രൗസിംഗി നായി വിദ്യാർത്ഥികളെ ഞാൻ സഹായി ക്കാറുണ്ട്.					
26.	കുട്ടികളുടെയും രക്ഷകർത്താക്കളുടെയും e-mail Id ശേഖരിച്ച് ഗ്രൂപ്പ് മെസ്സേജ് ഞാൻ അയക്കാറുണ്ട്.					
27.	ഓൺലൈൻ ലൈബ്രറികൾ സന്ദർശിക്കു ന്നത് എന്റെ വിനോദങ്ങളിൽ ഒന്നാണ്.					
28.	എന്റെ വിഷയവുമായി ബന്ധപ്പെട്ട് മെറ്റീരി യലുകൾ നെറ്റിൽനിന്നും ഞാൻ സ്ഥിര മായി ഡൗൺലോഡ് ചെയ്ത് ഉപയോഗി ക്കാറുണ്ട്.					

ക്രമ നമ്പർ	പ്രസ്താവന	എല്ലായ്പ്പോഴും	മിക്കപ്പോഴും	ചിലപ്പോഴും	അപൂർവ്വമായി	ഒരിക്കലുമില്ല
29.	ക്ലാസ്സിലേക്ക് വേണ്ടിയുള്ള Lesson നോട്ട് പ്രിപ്പയർ ചെയ്യുന്നതിനുവേണ്ടി SIET കേരളയുടെ സെൽഫി പോലുള്ള മൊബൈൽ ആപ്ലിക്കേഷനുകൾ ഞാൻ സന്ദർശിക്കുകയും അതിലെ content ഉപയോഗിക്കാറുമുണ്ട്.					
30.	ലാപ്പ്ടോപ്പ് ഉപയോഗിച്ച് ക്ലാസ്സെടുക്കാൻ സാധിക്കാറുണ്ട്.					
31.	Power point slide ഹാൻഡ് ഔട്ടായി പ്രിന്റ് എടുക്കാൻ എനിക്ക് സാധിക്കാറുണ്ട്.					
32.	ഓൺ ലൈൻ പരീക്ഷകൽ അറ്റൻഡ് ചെയ്യാൻ കുട്ടികളെ ഞാൻ പ്രോത്സാഹിപ്പിക്കാറുണ്ട്.					
33.	ക്ലാസ്സിൽ പഠിച്ച വിഷയത്തെപറ്റിയുള്ള ഓൺലൈൻ ടൂട്ടോറിയലുകൾ കാണാൻ ഞാൻ പ്രോത്സാഹിപ്പിക്കാറുണ്ട്.					
34.	സെമിനാറിന് ആവശ്യമുള്ള മെറ്റീരിയലുകൾ ഇന്റർനെറ്റിൽ നിന്നും ഡൗൺലോഡ് ചെയ്യാൻ ഞാൻ കുട്ടികളെ പ്രോത്സാഹിപ്പിക്കാറുണ്ട്.					
35.	കുട്ടികൾക്ക് അവരുടെ e-mail address ഉണ്ടാക്കാനും അതിൽ മെസ്സേജുകൾ സെന്റ് ചെയ്യാനും റിസീവ് ചെയ്യാനും ഞാൻ പരിശീലിപ്പിക്കാറുണ്ട്.					
36.	എന്റെ വിഷയം സംബന്ധമായി ബ്ലോഗുകളും ട്വീറ്റുകളും ഞാൻ വായിക്കുകയും ആശയങ്ങൾ ഉൾകൊള്ളുകയും ചെയ്യാറുണ്ട്.					
37.	ഞാൻ വിദ്യാർത്ഥികൾക്ക് നോട്ടുകളുടെ പ്രിന്റ് തയ്യാറാക്കി നൽകാറുണ്ട്.					
38.	പഠനപ്രവർത്തനങ്ങളുമായി ബന്ധപ്പെട്ട് ഇലക്ട്രോണിക്ക് എൻസൈക്ലോപീഡിയ ഞാൻ ഉപയോഗിക്കാറുണ്ട്.					

ക്രമ നമ്പർ	പ്രസ്താവന	എല്ലായ്പ്പോഴും	മിക്കപ്പോഴും	ചിലപ്പോൾ	അപൂർവ്വമായി	ഒരിക്കലുമില്ല
39.	എന്റെ ക്ലാസ്സിൽ ആവശ്യമായ വീഡിയോ Lesson ഞാൻ യൂ ട്യൂബിൽ നിന്നും ഡൗൺലോഡ് ചെയ്ത് ഡ്രൈവിൽ സേവ് ചെയ്യാറുണ്ട്.					
40.	ഓൺലൈൻ ടൂട്ടോറിയലുകൾ ഉപയോഗിച്ച് ക്ലാസ്സ് എടുക്കാൻ എനിക്ക് സാധിക്കാറുണ്ട്.					
41.	വിഷയവുമായി ബന്ധപ്പെട്ട പാഠ്യവസ്തുതകളെ E-Contents കളാക്കി സമഗ്രതയിലേക്ക് ഞാൻ അപ്ലോഡ് ചെയ്യാറുണ്ട്.					
42.	വിഷയങ്ങളുമായി ബന്ധപ്പെട്ട് ചെറിയ ഓൺലൈൻ ടെസ്റ്റുകൾ വിദ്യാർത്ഥികൾക്കായി നടത്താറുണ്ട്.					
43.	ICT സൗകര്യങ്ങൾ ഉപയോഗിച്ച് ചോദ്യബാങ്കുകൾ തയ്യാറാക്കി ഉപയോഗിക്കാറുണ്ട്.					
44.	ക്ലാസ്സ് റൂം പഠനം ചലനാത്മകമാക്കാൻ അതിലെ പ്രവൃത്തികളുമായി ബന്ധപ്പെട്ട പലതരം വീഡിയോകൾ ഞാൻ ഉപയോഗിക്കാറുണ്ട്.					
45.	വീഡിയോ കോൺഫറൻസിങ്ങ് ഉപയോഗിച്ച് ആശയവിനിമയം ചെയ്യാൻ ഞാൻ ശ്രമിക്കാറുണ്ട്.					
46.	പാഠ്യാസൂത്രണവുമായി ബന്ധപ്പെട്ട ഓൺലൈൻ സംവിധാനങ്ങൾ ഞാൻ പ്രയോജനപ്പെടുത്താറുണ്ട്.					
47.	പാഠ്യാസൂത്രണങ്ങൾ E-contents രൂപത്തിൽ പ്രധാന അദ്ധ്യാപകന് സമർപ്പിക്കാറുണ്ട്.					
48.	സോഷ്യൽ നെറ്റ് വർക്കിംങ്ങ് മീഡിയയുടെ സഹായത്തോടെ കുട്ടികൾക്കിടയിൽ ആകർഷകമായ പഠനപ്രവർത്തനങ്ങൾ സംഘടിപ്പിക്കാറുണ്ട്.					
49.	മൾട്ടി മീഡിയ ഉപകരണങ്ങൾ ക്ലാസ്സ് റൂം പ്രവർത്തനങ്ങൾക്ക് ഉപയോഗപ്പെടുത്താനുള്ള പ്രാഥമിക വിവരങ്ങൾ ഒരു അദ്ധ്യാപകൻ എന്ന നിലയിൽ എനിക്കുണ്ട്.					

ക്രമ നമ്പർ	പ്രസ്താവന	എല്ലായിടത്തും	മിക്കയിടത്തും	ചിലപ്പോൾ	അപൂർവ്വമായി	ഒരിക്കലുമില്ല
50.	പാഠഭാഗവുമായി ബന്ധപ്പെട്ട ഓഡിയോ വീഡിയോ ഫയലുകൾ സഹപ്രവർത്തകർക്ക് അയച്ചുകൊടുക്കാറുണ്ട്.					

Appendix III

FAROOK TRAINING COLLEGE, CALICUT
Techno – Pedagogical Skill Assessment Scale
(Final)

Dr. T. Mohammed Saleem
Associate Professor.
(Supervising Teacher)

Surabhila. T. R.
M. Ed. Student

Direction:

A few statements regarding Techno – Pedagogical Skill usage is given below. Please read carefully every statement and give your response in the appropriate column using tic mark. Please note that only one response cold be selected at a time. We assure you that the details given you will be used for research purpose only and will not be shared with anyone else.

Serial No.	Statement	Always	Often	Sometimes	Rarely	Never
1.	I, Used to log on to the **Samagra Resource Portal** and use its **contents** in the class					
2.	I, Used to encourage the students to submit online assignments					
3.	I, Used to help the students to use computer wallpapers to prepare Projects					
4.	I can prepare the mark list of my students using MS Excel sheet					
5.	To prepare and publish the Grade of my students I use Excel sheet					
6.	I am able to enlighten my students on Cyber crimes					
7.	I, Used to train my students to download files from internet and to save them					
8.	To improve my communication, I Use the E-Language Library					
9.	I, Used to give assignments to my students using **Google Class Room Tools** and ensure its submission					
10.	I, Used to submit applications online					

Serial No.	Statement	Always	Often	Sometimes	Rarely	Never
11.	I, Used to help students preparation of online Portfolio					
12.	I, Used to help children to download materials for bulletin board from internet					
13.	I, Used to prepare the question papers using MS word					
14.	I, Used to encourage students to prepare power point presentation and send it online					
15.	I, Used to encourage students to listen audio lessons					
16.	I have taken membership in various forums connected with my subjects to improve my class					
17.	I, Used to check my e-mail account every day					
18.	I, Used to download E-textbook from textbook for Kerala syllabus mobile application for the use in class room					
19.	I, Used to update the downloaded materials kept in my drive, regularly					
20.	I, have full confidence to use smart classroom in teaching					
21.	I am able to handle class using any type of LCD projectors					
22.	I have the capacity to prepare Spread Sheet					
23.	I can prepare Graff/Diagram on the performance of students using computer					
24.	I, Used to help students in healthy Internet Browsing					
25.	I, Used to send group messages, after collecting e-mail Id of students and Parents					
26.	I, Used to download materials connected with my subject from the internet					
27.	To prepare lesson note for the class, I use the contents form the mobile applications like					

Serial No.	Statement	Always	Often	Sometimes	Rarely	Never
	Selfie of the SIET					
28.	I can take classes using Laptop.					
29.	I am able to take printouts of Power Point Presentation to use as handouts					
30.	I, Used to encourage the students to watch the online tutorials on the topics learned in the class					
31.	I, Used to help them to download materials for Seminars					
32.	I, Used to teach students to make their e-mail Id and to send and receive mails					
33.	I, Used to read the Blogs and Tweets connected with my topic and assimilate it.					
34.	I, Used to give printouts of the notes prepared by me					
35.	I, Use the Electronic Encyclopaedia for teaching					
36.	I, Used to download and keep saved the necessary video lessons from the YouTube					
37.	I can take classes using online tutorial platform					
38.	I, Used to upload materials connected with my topic as E-Contents to Samagra					
39.	I, Used to conduct small online tests for the Students					
40.	I, Used to prepare question banks using ICT facilities and make use of them					
41.	To make the classroom learning interesting, I use videos connected with the topic					
42.	I, Use the Video conference facility to my views when available					
43.	I, Use the online facilities in the lesson planning					
44.	I, Used to submit the lesson plan as E-					

Serial No.	Statement	Always	Often	Sometimes	Rarely	Never
	Contents to the Head Master/ Principal					
45.	I, Used to conduct attractive learning sessions with the help of Social Networking Media.					
46.	As a teacher, I have the knowledge to use the multimedia facilities in the classroom					
47.	I, Used to sent the Audio-Video files connected with the topics to my associates					

Appendix IV

FAROOK TRAINING COLLEGE, CALICUT
Techno-Pedagogical Skill Assessment Scale
(Final)

Dr. T. Mohamed Saleem
Associate Professor
(Supervising Teacher)

Surabhila.T.R
M.Ed. Student

നിർദ്ദേശങ്ങൾ

Techno - Pedagogical Skill മായി ബന്ധപ്പെട്ട് ഏതാനും പ്രസ്താവനകളാണ് താഴെ കൊടുത്തിരിക്കുന്നത് ഓരോ പ്രസ്താവനയും ശ്രദ്ധാപൂർവ്വം വായിച്ച് തന്നിരിക്കുന്ന പ്രതികരണ പേജിൽ.....ഉപയോഗിച്ച് നിങ്ങളുടെ പ്രതികരണങ്ങൾ രേഖപ്പെടുത്തുക. ഒരു പ്രസ്താവനയ്ക്ക് ഒരു പ്രതികരണം മാത്രമേ രേഖപ്പെടുത്താവൂ. നിങ്ങൾ നൽകുന്ന വിവരങ്ങൾ വളരെ രഹസ്യമായി സൂക്ഷിക്കുന്നതാണെന്നും ഗവേഷണാവശ്യത്തിനു മാത്രമേ ഉപയോഗിക്കുകയുള്ളൂ എന്നും ഉറപ്പുനൽകുന്നു.

ക്രമ നമ്പർ	പ്രസ്താവന	എല്ലായ്പ്പോഴും	മിക്കപ്പോഴും	ചിലപ്പോഴും	അപൂർവ്വമായി	ഒരിക്കലുമില്ല
1.	സമഗ്ര റിസോഴ്സ് പോർട്ടൽ ഞാൻ സ്ഥിരമായി സന്ദർശിക്കുകയും അതിലെ Content-കൾ ക്ലാസ്സിൽ ഉപയോഗിക്കാറുമുണ്ട്.					
2.	ഓൺലൈൻ അസൈൻമെന്റ് സബ്മിറ്റ് ചെയ്യാൻ ഞാൻ കുട്ടികളെ പ്രോത്സാഹിപ്പിക്കാറുണ്ട്					
3.	കമ്പ്യൂട്ടർ വാൾപേപ്പറുകൾ ഉപയോഗിച്ച് പ്രോജക്ട് തയ്യാറാക്കുന്നതിന് ഞാൻ എന്റെ കുട്ടികളെ സഹായിക്കാറുണ്ട്					
4.	എന്റെ ക്ലാസ്സിലെ കുട്ടികളുടെ മാർക്ക് ലിസ്റ്റ് ഞാൻ എം.എസ്. എക്സൽ ഉപയോഗിച്ച് തയ്യാറാക്കി ഉപയോഗിച്ചുവരുന്നു.					
5.	പരീക്ഷയിൽ കുട്ടികളുടെ പ്രകടനങ്ങളുടെ ഗ്രേഡ് തയ്യാറാക്കാനും പ്രദർശിപ്പിക്കാനും എക്സൽ ഷീറ്റ് ഞാൻ ഉപയോഗിക്കാറുണ്ട്.					

ക്രമ നമ്പർ	പ്രസ്താവന	എല്ലായ്പ്പോഴും	മിക്കപ്പോഴും	ചിലപ്പോഴും	അപൂർവമായി	ഒരിക്കലുമില്ല
6.	സൈബർ കുറ്റകൃത്യങ്ങളെ കുറിച്ച് എന്റെ വിദ്യാർത്ഥികളെ ബോധവൽക്കരിക്കാൻ എനിക്ക് സാധിക്കാറുണ്ട്					
7.	ഇന്റർനെറ്റിൽ നിന്നും എങ്ങനെ ഫയലുകൾ ഡൗൺലോഡ് ചെയ്യണമെന്നും അവ എങ്ങനെ ഡ്രൈവിലേക്ക് സേവ് ചെയ്യണം എന്നും എന്റെ കൂട്ടികളെ ഞാൻ പരിശീലിപ്പിക്കാറുണ്ട്.					
8.	എന്റെ ആശയവിനിമയ വൈദഗ്ധ്യം മെച്ചപ്പെടുത്താൻ ഞാൻ E- ഭാഷ ലൈബ്രറി ഉപയോഗിക്കാറുണ്ട്.					
9.	ഗൂഗിൾ class room tools ഉപയോഗിച്ച് കുട്ടികൾക്ക് അസൈൻമെന്റ് കൊടുക്കാനും അതിന്റെ സബ്മിഷൻ ഉറപ്പുവരുത്താനും ഞാൻ ശ്രമിക്കാറുണ്ട്.					
10.	Online അപേക്ഷകൾ പൂരിപ്പിച്ച് ഞാൻ സമർപ്പിക്കാറുണ്ട്.					
11.	Online പോർട്ട് പോളിയോ തയ്യാറാക്കാൻ കുട്ടികളെ സഹായിക്കാറുണ്ട്.					
12.	ബുള്ളറ്റിൽ ബോർഡിലേക്കുള്ള മെറ്റീരിയലുകൾ ഇന്റർനെറ്റിൽനിന്നും ഡൗൺലോഡ് ചെയ്യാൻ കുട്ടികളെ ഞാൻ സഹായിക്കാറുണ്ട്.					
13.	ഞാൻ എം.എസ് വേർഡ് ഉപയോഗിച്ചാണ് ചോദ്യപേപ്പർ തയ്യാറാക്കുന്നത്					
14.	സ്വന്തമായി power point presentation തയ്യാറാക്കി അത് ഓൺലൈനായി സബ്മിറ്റ് ചെയ്യാൻ ഞാൻ കുട്ടികളെ പ്രോത്സാഹിപ്പിക്കാറുണ്ട്.					
15.	വിദ്യാർത്ഥികളെ ഓഡിയോ ലെൻസ് കേൾക്കാൻ ഞാൻ പ്രോത്സാഹിപ്പിക്കാറുണ്ട്.					
16.	ക്ലാസ്സ് മെച്ചപ്പെടുത്താനായി എന്റെ വിഷയവുമായി ബന്ധപ്പെട്ട വിവിധ ഫോറങ്ങളിൽ മെമ്പർഷിപ്പ് എടുത്തിട്ടുണ്ട്.					

ക്രമ നമ്പർ	പ്രസ്താവന	എല്ലായ്പ്പോഴും	മിക്കപ്പോഴും	ചിലപ്പോഴും	അപൂർവമായി	ഒരിക്കലുമില്ല
17.	ഞാൻ എന്റെ ഇ-മെയിൽ അക്കൗണ്ട് ദിവസവും നോക്കാറുണ്ട്.					
18.	ടെക്സ്റ്റ് ബുക്ക് ഫോർ കേരള സിലബസ് പോലുള്ള മൊബൈൽ ആപ്ലിക്കേഷനിൽ നിന്നും E- ടെക്സ്റ്റ് ബുക്ക് ഡൗൺലോഡ് ചെയ്ത് ഞാൻ ഉപയോഗിക്കാറുണ്ട്.					
19.	ഡൗൺലോഡ് ചെയ്ത് മെറ്റീരിയലുകൾ ഞാൻ എന്റെ ഡ്രൈവിൽ സ്ഥിരമായി അപ്ഡേറ്റ് ചെയ്യാറുണ്ട്.					
20.	അദ്ധ്യാപനത്തിൽ സ്മാർട്ട് ക്ലാസ് റൂം ഉപയോഗിക്കാൻ എനിക്ക് ആത്മവിശ്വാസമുണ്ട്.					
21.	ഏതുവിധത്തിലുള്ള എൽ.സി.ഡി. പ്രൊജക്ടറുകൾ ഉപയോഗിച്ചും ക്ലാസ്സ് എടുക്കാൻ എനിക്കറിയാം.					
22.	Spread sheet തയ്യാറാക്കാനുള്ള നൈപുണ്യം എനിക്കുണ്ട്					
23.	Computer ഉപയോഗിച്ച് കുട്ടികളുടെ പ്രകടനത്തിന് ഗ്രാഫ്/ഡയഗ്രം എന്നിവ തയ്യാറാക്കാൻ എനിക്ക് സാധിക്കാറുണ്ട്.					
24.	ആരോഗ്യകരമായ ഇന്റർനെറ്റ് ബ്രൗസിംഗിനായി വിദ്യാർത്ഥികളെ ഞാൻ സഹായിക്കാറുണ്ട്.					
25.	കുട്ടികളുടെയും രക്ഷകർത്താക്കളുടെയും e-mail Id ശേഖരിച്ച് ഗ്രൂപ്പ് മെസ്സേജ് ഞാൻ അയക്കാറുണ്ട്.					
26.	എന്റെ വിഷയവുമായി ബന്ധപ്പെട്ട് മെറ്റീരിയലുകൾ നെറ്റിൽനിന്നും ഞാൻ സ്ഥിരമായി ഡൗൺലോഡ് ചെയ്ത് ഉപയോഗിക്കാറുണ്ട്.					

ക്രമ നമ്പർ	പ്രസ്താവന	എല്ലായ്പ്പോഴും	മിക്കപ്പോഴും	പലപ്പോഴും	അപൂർവമായി	ഒരിക്കലുമില്ല
27.	ക്ലാസ്സിലേക്ക് വേണ്ടിയുള്ള Lesson നോട്ട് പ്രിപ്പയർ ചെയ്യുന്നതിനുവേണ്ടി SIET കേരളയുടെ സെൽഫി പോലുള്ള മൊബൈൽ ആപ്ലിക്കേഷനുകൾ ഞാൻ സന്ദർശിക്കുകയും അതിലെ content ഉപയോഗിക്കാറുമുണ്ട്.					
28.	ലാപ്പ്ടോപ്പ് ഉപയോഗിച്ച് ക്ലാസ്സെടുക്കാൻ സാധിക്കാറുണ്ട്.					
29.	Power point slide ഹാൻഡ് ഔട്ടായി പ്രിന്റ് എടുക്കാൻ എനിക്ക് സാധിക്കാറുണ്ട്.					
30.	ക്ലാസ്സിൽ പഠിച്ച വിഷയത്തെപറ്റിയുള്ള ഓൺലൈൻ ട്യൂട്ടോറിയലുകൾ കാണാൻ ഞാൻ പ്രോത്സാഹിപ്പിക്കാറുണ്ട്.					
31.	സെമിനാറിന് ആവശ്യമുള്ള മെറ്റീരിയലുകൾ ഇന്റർനെറ്റിൽ നിന്നും ഡൗൺലോഡ് ചെയ്യാൻ ഞാൻ കുട്ടികളെ പ്രോത്സാഹിപ്പിക്കാറുണ്ട്.					
32.	കുട്ടികൾക്ക് അവരുടെ e-mail address ഉണ്ടാക്കാനും അതിൽ മെസ്സേജുകൾ സെന്റ് ചെയ്യാനും റിസീവ് ചെയ്യാനും ഞാൻ പരിശീലിപ്പിക്കാറുണ്ട്.					
33.	എന്റെ വിഷയം സംബന്ധമായി ബ്ലോഗുകളും ട്വീറ്റുകളും ഞാൻ വായിക്കുകയും ആശയങ്ങൾ ഉൾകൊള്ളുകയും ചെയ്യാറുണ്ട്.					
34.	ഞാൻ വിദ്യാർത്ഥികൾക്ക് നോട്ടുകളുടെ പ്രിന്റ് തയ്യാറാക്കി നൽകാറുണ്ട്.					
35.	പഠനപ്രവർത്തനങ്ങളുമായി ബന്ധപ്പെട്ട് ഇലക്ട്രോണിക്ക് എൻസൈക്ലോപീഡിയ ഞാൻ ഉപയോഗിക്കാറുണ്ട്.					
36.	എന്റെ ക്ലാസ്സിൽ ആവശ്യമായ വീഡിയോ Lesson ഞാൻ യൂ ട്യൂബിൽ നിന്നും ഡൗൺലോഡ് ചെയ്ത് ഡ്രൈവിൽ സേവ് ചെയ്യാറുണ്ട്.					

ക്രമ നമ്പർ	പ്രസ്താവന	എല്ലായ്പ്പോഴും	മിക്കപ്പോഴും	ചിലപ്പോഴും	അപൂർവമായി	ഒരിക്കലുമില്ല
37.	ഓൺലൈൻ ടൂട്ടോറിയലുകൾ ഉപയോഗിച്ച് ക്ലാസ്സ് എടുക്കാൻ എനിക്ക് സാധിക്കാറുണ്ട്.					
38.	വിഷയവുമായി ബന്ധപ്പെട്ട പാഠ്യവസ്തുതകളെ E-Contents കളാക്കി സമഗ്രതയിലേക്ക് ഞാൻ അപ്ലോഡ് ചെയ്യാറുണ്ട്.					
39.	വിഷയങ്ങളുമായി ബന്ധപ്പെട്ട് ചെറിയ ഓൺലൈൻ ടെസ്റ്റുകൾ വിദ്യാർത്ഥികൾക്കായി നടത്താറുണ്ട്.					
40.	ICT സൗകര്യങ്ങൾ ഉപയോഗിച്ച് ചോദ്യ ബാങ്കുകൾ തയ്യാറാക്കി ഉപയോഗിക്കാറുണ്ട്.					
41.	ക്ലാസ്സ് റൂം പഠനം ചലനാത്മകമാക്കാൻ അതിലെ പ്രവൃത്തികളുമായി ബന്ധപ്പെട്ട പലതരം വീഡിയോകൾ ഞാൻ ഉപയോഗിക്കാറുണ്ട്.					
42.	വീഡിയോ കോൺഫറൻസിങ്ങ് ഉപയോഗിച്ച് ആശയവിനിമയം ചെയ്യാൻ ഞാൻ ശ്രമിക്കാറുണ്ട്.					
43.	പാഠ്യാസൂത്രണവുമായി ബന്ധപ്പെട്ട ഓൺലൈൻ സംവിധാനങ്ങൾ ഞാൻ പ്രയോജനപ്പെടുത്താറുണ്ട്.					
44.	പാഠ്യാസൂത്രണങ്ങൾ E-contents രൂപത്തിൽ പ്രധാന അദ്ധ്യാപകന് സമർപ്പിക്കാറുണ്ട്.					
45.	സോഷ്യൽ നെറ്റ് വർക്കിംങ്ങ് മീഡിയയുടെ സഹായത്തോടെ കുട്ടികൾക്കിടയിൽ ആകർഷകമായ പഠനപ്രവർത്തനങ്ങൾ സംഘടിപ്പിക്കാറുണ്ട്.					
46.	മൾട്ടി മീഡിയ ഉപകരണങ്ങൾ ക്ലാസ്സ് റൂം പ്രവർത്തനങ്ങൾക്ക് ഉപയോഗപ്പെടുത്താനുള്ള പ്രാഥമിക വിവരങ്ങൾ ഒരു അദ്ധ്യാപകൻ എന്ന നിലയിൽ എനിക്കുണ്ട്.					
47.	പാഠഭാഗവുമായി ബന്ധപ്പെട്ട ഓഡിയോ വീഡിയോ ഫയലുകൾ സഹപ്രവർത്തകർക്ക് അയച്ചുകൊടുക്കാറുണ്ട്.					

Appendix V

FAROOK TRAINING COLLEGE, CALICUT

Interview schedule on Techno-Pedagogical Skill of teachers for head masters

Dr. T. Mohammed Saleem
Associate Professor.
(Supervising Teacher)

Surabhila. T. R.
M. Ed. Student

1. Are all teachers submitting their lesson plans online?
2. If there is a problem in conducting audio or video class are teachers capable of correcting themselves or will they take help from others?
3. Are all teachers given special training in usage of computer and other instruments?
4. Are all the teachers using Audio visual aids to conduct the class
5. Are they able to attach audio video files through mail with the lesson plan
6. Online submission of assignment and other files are encouraged or not
7. Are all teachers capable of updating software of their tap top or computer?
8. Are there any awareness class for students to make them aware of dangers of cyber crime and how to use technology safely
9. Are all the teachers using multimedia files for teaching learning process
10. how is the maintenance of the audio visual aids done