PERCEPTION OF PROSPECTIVE TEACHERS TOWARDS THE UTILITY OF ICT IN TEACHING-LEARNING PROCESS IN KANYAKUMARI DISTRICT

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MASTER OF EDUCATION

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DECLARATION

I hereby declare that this dissertation ***"Perception of Prospective Teachers towards the Utility of ICT in Teaching-Learning process in Kanyakumari District"*** submitted by me for the degree of Master of Education is the result of my original and independent research work carried out under the guidance of **Mrs. Bindu Gouri .V.P,** Assistant Professor in Education, N.V.K.S.D. College of Education, Attoor and it has not been submitted elsewhere for the award of any degree, diploma, and fellowship of any other university or institution.

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CERTIFICATE

This is to certify that this dissertation entitled **"Perception of Prospective Teachers towards the Utility of ICT in Teaching-Learning process in Kanyakumari District"** submitted for the M.Ed. degree by **JIMI.I.B** is an original record of research work carried by her under my guidance and supervision. It is further certified that the work is an original one, free from any duplication.

Place: Attoor

Date: **Mrs. V.P. Bindu Gouri**

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CHAPTER – I

INTRODUCTION

- Need and Significance of the study
- Statement of the Problem
- Operational definition of the terms
- Objectives of the Study
- Hypotheses framed
- Methodology in brief
- Delimitations of the study
- Organization of the report

Information and communication technology has become very much popular and is most widely used. It is the latest buzzword of the computer industry. It has helped people of all walks of life in one way or the other. ICT is the modern science of gathering, storing, manipulating, and communicating the desired types of information in a specific environment. “Computer technology and Communication technology” are the two main supporting pillars of this technology. The importance of information and communication technologies in the educational, cultural, agricultural, scientific and technical areas of the human involvement, are increasing.

In educational field, ICT plays an important role in educational methodology and providing education for the mass. The educational institutions concerned are expanding student’s population and the effectiveness of teaching. So the various technological and social developments have been reshaping almost all aspects of human life. Among them, ICT

occupies an important role. If the teachers utilized ICT technologies, they can spend a high proportion of time on focused interactive teaching, and start lessons in ways that engage pupils. They can be confident about planning, teaching and assessing all aspects of information and communication technology and use ICT to support teaching of other subjects. ICT helps to improve teachers own skills. Today's modern world is an era of digital instruments in all the field of human system. Its due to the vast growth of science and technologies, known as ICT.

Increasing the quality of teaching and learning is an important concern for education. Education is facing many challenges. To facilitate and improve performance, educational techniques attempts to overcome challenges by development new approach and frame works. Integration of ICTs enhances the quality of education by helping prospective teachers to carry out their in-service training in a better way and helps the students to learn more effectively. The future teachers must understand how ICTs can be used to teach the content in rich and meaningful ways.

ICT stands for Information and Communication Technology, ICT refers to all electronic Medias. It can be Radio, TV and computer and other electronic accessories. Studies through a vast majority of teachers have a positive opinion concerning the potentials of technologies to create effective learning environments but only a few of them have been using ICT tools in colleges.

NEED AND SIGNIFICANCE OF THE STUDY

Day by day, there is an increasing demand to teach via computer and internet. Many of the institutions are taking advantage of technology in managing learning and administration. The main purpose of ICT is to provide students and teachers with more options to learn, teach, research, communicate and share knowledge. Students are provided opportunities to develop their understanding of how ICT can be used to support their learning. The world of technology implies the use of different electronic media like OHP, slide, PowerPoint presentation, web-based learning, e-learning, e-tutoring, CAI, CMI, Tele-conferencing, Interactive video, multimedia learning, satellite Instructional Television, Programmed learning, EDUSAT, virtual classroom, e-book, digital library and so on.

Information and Communication Technology supports learning in a number of ways. ICT extends children's experiences and literacy skills. It encourages the learner to express their ideas, thoughts and feelings effectively and add to students understanding and pleasure (Chin 2004). ICT can help a language teacher to establish a better rapport with students. ICT helps to deliver content in the same way delivered through a lecture. Improved eye contact can be developed when the students switch between technology and teacher. Many teachers fear that ICT may replace the role of teachers.

Prospective teacher's perception plays a significant role in the use of computers in the classroom. Many prospective teachers worry about their lack of skills and knowledge about computers. To make optimal use of computers in teaching and learning, fear of technology and unavailability of software should be tackled. In this scientific and technological era, teachers should be more aware of the use of ICT in the teaching learning process. Teachers should perceive the use of computer technology positively and should have a favorable perception towards it in teaching learning process. Hence the investigator found it relevant to select the topic "Perception of prospective teachers towards the utility of ICT in teaching learning process in Kanykumari district"

ICTs alone do not produce learning; technology is a tool that can be used in many ways, to enhance learning. There are three major categories of instructional use for computer-based technologies; these are: i) learning from technologies; ii) learning about technology; and iii) learning with technology.

Instructional implications of ICTs are mostly based on constructivist theory based on observation and scientific study about how people learn. It holds that people construct their own understanding and knowledge of the world through experiencing things and reflecting on those experiences. Constructivism transforms the student from a passive recipient of information to an active participant in the learning process. Always guided by the teachers, students construct their knowledge actively rather than just mechanically acquiring knowledge from the teacher or the textbook. Students become engaged by applying their existing knowledge and real-world experience-

learning to hypothesize, testing their and ultimately drawing conclusions from their findings.

Constructivist learning theory suggests that a teacher must understand what learners bring to the learning situation and begin to help students to build their new knowledge. Technology can help to make students' thinking process more visible to the teacher, something that does not happen when students simply turn in a completed assignment for checking and grading. It is learning with, not from or about, technology that makes computer based technology an important tool in the new paradigram of learning. In order to capitalize on the potential of new technology, and particularly digital technology as a teaching tool, there is an urgent need for the professional development of teachers, to construct professional knowledge about pedagogy, content, and technology, as well as strategies for managing the changing classroom environments brought about with the creation of constructivist learning environments supported by technology. Thus the emerging technologies can provide a platform where different types of media input can coverage.

STATEMENT OF THE PROBLEM

The problem selected for the present study is entitled as "**PERCEPTION OF PROSPECTIVE TEACHERS TOWARDS THE UTILITY OF ICT IN TEACHING-LEARNING PROCESS IN KANYAKUMARI DISTRICT".**

OPERATIONAL DEFINITION OF TERMS

The key terms which need clarification are operationally defined as follows,

PERCEPTION

In the present study, perception is a continuous process of integration of present and past sensory impressions.

PROSPECTIVE TEARCHERS

In this study prospective teachers refer to those teachers who are studying for the B. Ed degree course in the colleges of Education affiliated to Tamil Nadu Teachers Education University.

ICT

In the present study, Information and Communication Technology is the catch-all phrase used to describe a range of technologies for gathering, storing, retrieving, processing, analyzing and transmitting information.

TEACHING-LEARNING PROCESS

In this study, Teaching-Learning process is a planned interaction that promotes behavioural changes that is not a result of maturation or coincidence.

TEACHING

Teaching is an active process in which one person shares information with others to provide them with the information to make behavioural changes.

LEARNING

Learning is a process of assimilating information with a result change in behaviour.

OBJECTIVES OF THE STUDY

1) To study the perception of prospective teachers towards the utility of ICT in teaching-learning process.
2) To study the significant difference, in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on Age.
3) To study the significant difference, in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on Gender.
4) To study the significant difference, in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on Locality.
5) To study the significant difference, in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on Religion.
6) To study the significant difference, in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on Type of management.

7) To study the significant difference, in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on Optional subject.
8) To study the significant difference, in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on Computer knowledge.
9) To study the significant difference, in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on Educational qualification.
10) To study the significant difference, in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on Family monthly income.

HYPOTHESES FRAMED FOR THE STUDY

The null hypotheses formulated for the study are as follows,

1) There exists no significant difference in the mean scores of the perception of prospective teachers towards the utility of ICT in teaching-learning process based on Age.
2) There exists no significant difference in the mean scores of the perception of prospective teachers towards the utility of ICT in teaching-learning process based on Gender.

3) There exists no significant difference in the mean scores of the perception of prospective teachers towards the utility of ICT in teaching-learning process based on Locality.
4) There exists no significant difference in the mean scores of the perception of prospective teachers towards the utility of ICT in teaching-learning process based on Religion.
5) There exists no significant difference in the mean scores of the perception of prospective teachers towards the utility of ICT in teaching-learning process based on Type of management.
6) There exists no significant difference in the mean scores of the perception of prospective teachers towards the utility of ICT in teaching-learning process based on Optional subject.
7) There exists no significant difference in the mean scores of the perception of prospective teachers towards the utility of ICT in teaching-learning process based on Computer knowledge.
8) There exists no significant difference in the mean scores of the perception of prospective teachers towards the utility of ICT in teaching-learning process based on Educational qualification.
9) There exists no significant difference in the mean scores of the perception of prospective teachers towards the utility of ICT in teaching-learning process based on Family monthly income.

METHODOLOGY OF THE STUDY

a) METHOD ADOPTED

Normative survey method is used for this study.

b) SAMPLE

The study was conducted on a sample of 400 prospective teachers of various colleges of Kanyakumari district.

c) TOOLS USED

The following tools were used for collecting data

- ICT perception inventory (constructed and validated by the investigator)
- Personal data sheet

d) STATISTICAL TECHNIQUES USED

- Percentage
- Arithmetic mean
- Standard deviation
- t- test
- ANOVA
- Scheffe's Procedure
- Pearson's product moment method of correlation.

DELIMITATIONS OF THE STUDY

- The study is limited to prospective teachers
- The sample size is limited to 400.
- The present study was only confined to Kanykumari district.
- Seven dimensions of utility of ICT were included in the questionnaire for data collection.

ORGANISATION OF THE REPORT

Chapter I deals with the need and significance of the study, statement of the problem, operational definitions, objectives, hypotheses framed and methodology in Brief, statistical techniques and organization of the report.

Chapter II consists of theoretical overview and review of related literature.

Chapter III contains the methodology normative survey method, the sample used for the study, the tool used for the study, data collection procedure and statistical techniques.

Chapter IV consists of analysis and interpretation of collected data.

Chapter V consists of findings, conclusions and suggestions for the further study.

CHAPTER – II

REVIEW OF RELATED LITERATURE

- Need for Review
- Significance of Review
- Purpose of the Review
- Theoretical Overview
- Review of Related Studies
    - Indian Studies
    - Abroad Studies
- Critical Review

The need and importance of related studies and literature have been highlighted by Best who says that “practically all human knowledge can be found in books and libraries. According to Dewey, the review of related studies is said to be the third step of scientific method. It helps the investigator to see the evidence already available and shows the problem adequately without further investigation and thus to avoid the risk of duplication. Every investigator is expected to know what sources are available in his field of enquiry.

The investigator studied various educational journals books, articles and research studies published in India and abroad related to this study.

Good, Barr and Scates highlighted the importance of related literature.

a) To provide ideas, theories, explanations or hypothesis valuable in formulating the problem.
b) To suggest methods of research appropriate to the problem.

c) To avoid the risk of duplicating the same study already undertaken.

d) To locate comparative data useful in the interpretations of results and to contribute to the general scholarship of the investigator.

In the words of Good the key to the vast store house of published literature may open door to sources of significant problem and exploratory hypothesis and provide helpful orientations for definitions of the problem background for sections of procedures and comparative data for interpretation of results. In order to be truly creative and original one must read extensively and critically as a stimulus to thinking.

NEED FOR REVIEW OF LITERATURE

Review of literature is considered as the most important pre-requisite to actual planning and conducting the study. A thorough examination of the literature i.e, the articles in science journals, review articles, books, monographs and other writings, which deal with a particular subject is essential for several reasons some of which are,

1) To assess the level of theory and research that have been developed in the field of study, and thus to find what is already know and what remains to be investigated in the specific field of study.
2) To understand the definitions of the established concepts and variables in the chosen field.
3) To identify and adopt the research design, analytical methods, scales, instruments, data analysis, etc.

4) To become fully aware of all the difficulties encountered by other workers and to thus avoid waste of time and money in the proposed research.
5) To learn how to write a research report.

All the above reasons become more evident when we prepare the final research report, especially while; a) justifying the choice of research topic and methodology and b) discussing our results and drawing valid inferences from our results. The review of literature indicates the clear picture of the problem to be solved.

SIGNIFICANCE OF REVIEW

The importance of the review is,

- The review of the literature is the basis of most of the research projects in the physical sciences, natural science, social science and humanities.
- A review of related literature gives the scholar an understanding of the previous work that has been done.
- The result of the review actually provide the data used in research.
- It enables us to know the means of getting to the frontier in the field of our problem.
- A review of the literature would develop the insight of the investigator.

- It places the researcher in a better position to interpret the significance of their own result.
- The importance of the review is quiet oblivious in delimiting the research problem and in defining it better.

PURPOSE OF THE REVIEW

- The review of related literature enables the researcher to define the limits of his filed.
- By reviewing the related literature the researcher can avoid unfruitful and useless problem areas.
- It provides the sources for hypotheses the researcher can formulate research hypotheses on the basis of available studies.
- It suggests method, procedure, sources of data and statistical techniques appropriate to the solution of the problem.
- It locates comparative data and findings useful in the interpretation and discussion of results.
- It helps in developing expertise and general scholarship of the investigator in the area investigated.

SECTION A

THEORETICAL OVER REVIEW

Information and Communication Technology (ICT)

Technology is the application of physical and social sciences in a systematic way. Essence of technology is all around us. They seem to be the driving force behind the global knowledge. Technology can provide inputs for all levels of education. Many research studies had discussed the role of technology in learning and many highlights the aspect that technology can improve learning. ICT is one of the recent developments in the 20^{th} century technology.

Definition of ICT

According to encyclopaedias of computer science, “Information and Communication Technology (ICT) is a precise term frequently applied to a broad area of activities and technology associated with the use of computers and communications (Chindandappa & Dharendara, 2006). Information and Communication Technology is a complex of artifice, techniques and knowledge for solving human problem, involving information and its communication Nath (2001). Information and Communication Technology are a diverse set of technological tools and resources to create, disseminate, store, bring value addition and manage information. Development of computer information, internet information, society, digital age, binary age, electronic

information, information super highway etc and its second name is information and communication technology.

The major themes of ICT

- ❖ Tasks effected
- ❖ Refinement assisted
- ❖ Ambience altered
- ❖ Motivation changed
- ❖ Learning reshaped
- ❖ Teaching displaced

Uses

- ➢ ICT in teacher education has the capacity to accelerate major changes both in pre-service as well as in-service teacher professional development.
- ➢ ICT facilitates the educational transaction provides and uses by keeping students well informed about the courses, enhancing teacher-learner contact through e-mail, chat sessions etc.
- ➢ ICT based teaching-learning programmes can overcome teacher's isolation by breaking down their classroom walls and connecting them to the global teacher community.
- ➢ The new ICT enables self-paced learning through various tools due to which the teaching-learning enterprise has become more result oriented.

Enhancing the use of ICT through the following ways

- All written assignment must be appropriately desktop published.
- Use of web based references should be allowed and encouraged.
- Seminars or presentations by students must make use of multimedia.
- Students must be encouraged to submit some or all of their assignments as E-mail attachments.
- Lesson plans should be based on ICT.
- Blueprint and question paper preparation can be documented using computers.
- The analysis and interpretation of the achievement test can be done using computer.
- Students should report their field experiences and project works in a CD form.

ICT in teaching-learning process

ICT supports teaching in many ways. The use of ICT makes teaching interesting and considerably reduces the work load of teachers. Teachers can be creative and can save time and effort that they normally spend on preparing notes. ICT helps to maintain discipline as it ensures more eye-contact, when dealing with a large class size. Maintaining discipline results to better class management.

ICT contributes to better and effective learning. They offer safe, non-threatening environment for learning. Learning is a collaborative process, where learners are put together and learning resources are shared. From this perspective, the emerging multimedia technology offers teachers a powerful pedagogical tool-kit. ICT promotes interactive learning. Interaction with authors, text, message, machines and visuals ensures meaningful learning ICT develops self-discovery and self-evaluation skills in learners.

The various initiatives setup by international agencies like British Educational Communications and Technology Agency (BECTA), National Council for Educational Technology (NCET) has been targeted towards encouraging teachers to include ICT in the delivery of their chosen subject and "to create a society within ten years where ICT has permeated every aspect of education".(Cook,1999).

Web-Based Learning

Web-based learning is a major sub- component of the term 'e-learning' with which instruction is delivered. It seeks to serve learners even at some distance from their learning facilitator. It attempts to serve learners in interacting with the learning source and thus it reduces the barriers of time and space to learning. Web-based learning environments may be designed for distance as well as face-to-face learners. The learning experience must have a clear purpose with tightly focused outcomes and objectives. Web-based learning designs must consider the nature of content, specific context, desired learning outcomes and characteristics of the learner. The learner should be

actively engaged. Learning by doing, analogy and assimilation are increasing important pedagogical forms. Where possible, learning outcomes should relate to real-life experiences through simulation and application.

The learning environment makes appropriate use of a variety of media. Various learning styles are best engaged by using a variety of media to achieve learning outcomes. Learning environments must include problem-based as well as knowledge-based learning. Problem-based learning involves higher order thinking skills such as analysis, synthesis and evaluation while knowledge-based learning involves recall, comprehension and application. Learning experiences should support interaction and the development of communities of interest. Learning experiences based on interaction and collaboration support learning communities while building a support network to enhance learning outcomes.

E-Learning

E-learning is available at the time a learner needs it in order to perform a task, rather than only at the time a provider wants to make it available. E-Learning is an emerging educational paradigm where learners identify specifically what they need to learn and access it. E-learning is the exact content and delivery method that the learner needs and it is available at the time and place the learner needs it. E-learners get the right knowledge from the right person at the right time, when it is needed, not weeks or months later. E-learning helps learners stay on top of today's fast-paced education world.

E-learning incorporates Web and intranet-based applications as well as CD-ROMs, satellite channels and videotapes. The learners like the e-approach because they can learn at their own pace. Learners can customize their learning to fit their needs and engage in online collaborative learning communities, where they can exchange experiences and access the latest information from around the world and quickly update their skills. Electronic learning, or e-learning, is delivered straight to the desktop of the learner though an Internet or intranet connection. Web-based courses can be custom designed, accessed on demand, and updated as the needs arise. E-learning allows representative to study at their desks, at their own pace.

E-Teaching

E-teaching is a teaching and learning approach that combines the best features of traditional in-class instruction with the communication and resources potential available via the Web. E-Teaching is a technique for teaching and learning that uses the Internet to improve student success by enhancing and extending classroom instruction via the Web. E-Teaching is designed to bring pedagogically successful methods for teaching and learning. The essence of e-teaching is the feedback loop between the Web and the classroom. Students in an e-teaching classroom actively work on their knowledge of specific concepts during class by not only discussing or warm up responses, but also working on solving problems in a group setting. E-teaching is currently being used in the teaching of various subjects like biology,

geology, chemistry, psychology, and mathematics, as well as in nursing, history, economics and anthropology.

E-Tutoring

E-tutoring can be defined as teaching, support, management and assessment of students on programmes of study that involve a significant use of online technologies (Tech Learn, 2000). Thus, at first glance, e-tutoring is only different to tutoring in terms of the involvement of technology. E-tutoring contains vital differences in terms of time, distance and the specific technologies adopted, and these all have implications for teaching staff. The capabilities required can be quite different to face-to- face teaching both in terms of integrating appropriate forms of technology into learning activities and in managing and supporting students' learning online.

E-Tutoring provides live, online coaching, homework help and focused exam preparation from the tutors, irrespective of geographical location. Each student is offered personalized learning and individual interaction with a tutor. No special and expensive resources are needed to be tutored online. Tutoring online has been made very simple by recent advances in whiteboard and voice technology.

Teleconferencing Technology

A teleconferencing (also known as a video-teleconference) is a set of interactive telecommunication technologies which allows two or more locations to interact via two-way video and audio transmission simultaneously.

It has also been called visual collaboration and is a type of groupware. A teleconferencing system requires the audiovisual equipment, which includes a monitor, camera, microphone, and speaker, and a means of transmission. It is an economical solution for high quality teleconferencing.

Educational teleconferencing encountered within the classroom has the power to open the eyes of students to a whole new world of learning. The level of interest and absorption of material increases, as students tend to respond better to this interactive form of education. Teleconferencing facilitates learning by allowing remote or distant learners to meet, regardless of their location. Teleconferencing can also be used as a career or employee training tool. Many colleges are now collaborating with local businesses to offer students certification and business training. Student can also take advantage of mentoring services offered by companies in distant locations using teleconferencing technology.

EDUSAT (Education satellite)

The 'EDUSAT' or Education Satellite was launched by Indian Space Research Organization (ISRO) on 20th September 2004, from the launch pad of the Satish Dhawan Space Centre, Sriharikota; A.P. EDUSAT is an indigenously designed satellite, which is exclusively devoted to the field of education. The main purpose of this is to provide education to all people, primarily children from remote areas of the country who cannot go to schools or colleges. The classes would be conducted by various State Education

Boards, NCERT, CBSE, Universities etc in a studio environment using Power Point presentations as well as the common blackboard.

Satellites can establish the connectivity between urban educational institutions with adequate infrastructure imparting quality education and the large number of rural and semi-urban educational institutions that lack the necessary infrastructure. With the success of the INSAT-based educational services, a need was felt to launch a satellite dedicated for educational service and ISRO conceived the EDUSAT project in October 2002.

E-Books

One of the innovative developments in the field of information Technology is the emergence of E-Books, E-Journals and other E-reference sources. The E-book has a greater impact on learning process. The E-books are designed to facilitate the rapid retrieval of discrete items of information to answer specific questions. That is, specific concepts can be quickly and simply identified are retrieved from entire articles or books in order to search specific reference questions, because it is normally possible to search for occurrences of words or phrases anywhere in the text. Hence, the E-books have many advantages which have to be developed in such a way to ensure the inclusion of learner friendly components.

Digital Library

Information and communication Technology has revolutionized the concept of libraries. Each and every library is slowly getting digitized. A 'digital library' comprises digital collections, services and infrastructure to support lifelong learning, research, scholarly communication as well as preservation and conservation of our recorded knowledge. It is also a process of democratization of information. Libraries are also changing to meet the demand put on them. The term digital libraries were first popularized by the NSF/DARPA/NASA Digital Libraries Initiative in 1994.

Computer Assisted Instruction-CAI

Computer Assisted Instruction (CAI) is an extension of programmed learning material and the personalized system of instruction. In CAI, there is a flow of information and interaction between the computer and the student. The computer provides instruction directly to the student and allows him to interact with it through the lessons programmed in the system. The students, questions to the computer and feeds answers into it with the help of keyboard. The computer provides feedback to the student on the basis of his performance. The computer acts as a teacher to the student.

The computers are used in the classification of the pupils according to their abilities and in the preparation of the school time table also. Computers are useful in the maintenance and preservation of the progress cards of the

pupils. They are useful in the maintenance of the cumulative records of the pupils. Computer is used as tutors. They provide interaction. They provide stimulation. They provide the learners with learning experiences. They provide drill and practice to the students. The students move at their own pace. They get immediate feedback.

Computer Managed Instruction-CMI

In computer managed instructions, the computer gathers, stores and manages information to guide students through initialized learning experience. At the computer is being used in administrative and management those days, such type of use of computer is known as computer based learning, for example in disbursing the salaries of the teacher and other employers. Computer is not used directly in teaching process, but it is used as an helper in teaching - learning process. If a teacher is made free by assigning his other duties to the computer such as administrative, management activities, then he can utilize his spare time in an effective manner in the class-room.

MULTIMEDIA

Meaning

Multimedia is media and content that uses a combination of different content forms. It includes a combination of text, audio, still images, animation, video, and interactivity content forms.

Category

Multimedia may be broadly divided into linear and non-linear categories. Linear active content progresses without any navigational control for the viewer such as a cinema presentation. Non-linear content offers user interactivity to control progress as used with a computer game or used in self-paced computer based training. Hyper media is an example of non-linear content.

Multimedia presentations can be live or recorded. A recorded presentation may aloe interactivity via a navigator system. A live multimedia presentation may allow interactivity via an interaction with the presenter or performer. The candidates

Interactive Video

Computer-Based Instruction refers to instruction with the use of computers taking up one or the other. Computers may aid or assist instruction, i.e., assist teaching, or learning or both. Computers may mange the learning activity by assuming the role of manager of learning. Computers may as well evaluate the learning outcome of a learner by maintaining a question bank, set a question paper by objectives, score the response of the candidates and finally process the results in a comprehensive manner. The above modes of instruction are termed as CBI, CAI, CAL, CAT, CMI and CAE respectively as schematized in the diagram.

Computer-Enabled Learning (CEL)

The computer is the primary medium of teaching and learning. It offers interactive environment in which one can interact with the computer as learning materials are stored on the personal computer. Web-based learning provides integrated environments of various technologies to support diverse needs of the learners via the Internet. It is self-paced, highly interactive, results in increased retention rates and has reduced costs. Internet-based services and software provide a synchronous learning environment in which one has access to text-chart, web-conferencing, audio and video files and more. This technology can enable to share documents and applications with other users.

Computer conferencing connects two or more computers together to conduct information exchange. The learning materials delivered through a variety of ways include readings, handouts, audio-video components and traditional lectures. There is interactivity with the learners group. Computer conferencing allows communicating on topics of mutual interest. The necessary software is hosted on a multiuser computer system, which has sufficient disc space to store and retrieve all messages/information that are written. Computer conferencing create a virtual-classroom for formal and informal contact between fellow learners and experts. One can use computer conferencing at almost any time, from anywhere and at one's own pace. The time may be mutually decided in consultation with the expert and fellow learners.

ICTs have the potential to provide quality educational inputs. These bring inaccessible resources to the user at the learning centre, home or workplace. ICTs offer flexibility to learn from anywhere, at any time and at users own pace. Use of ICT can bridge the gap of time and space in learning at a distance with quality input. In order to learn from ICTs, the learner should be motivated enough and have a favourable attitude towards learning from ICTs. The learner has to take active part in the ICT-enabled learning processes.

SECTION B

REVIEW OF RELATED STUDIES

STUDIES CONDUCTED IN INDIA

Rathnabai and Viswanathappa (2013) "ICT Mediation in Learning Mathematics". A sample of 60 students from two sections of VIII standard from Noyes Mat. Hr. Sec. School, Madurai was taken for the study. To find out the effectiveness of computer- assisted instruction on the mathematics achievement among VIII standard students. To compare mathematics achievement of boys and girls who were taught through CAI approach. The findings showed that the results of the study are as follows, the achievement of the students exposed to the CAI approach is greater than the achievement of the students exposed to the conventional approach. There is no difference between boys &girls exposed to the CAI approach in achievement of mathematics.

Kaur (2013) "A study of attitude and practice of B.Ed Trainees towards ICT in teaching". The sample is consisted of the investigator selected 130 B.ed trainees in Panipat district using random sampling technique. Out of these 57 were male and 73 were female B.Ed trainees, 68 from urban area and 62 from rural area. A questionnaire comprises two sections pertaining to communication tools used and effectiveness of tools in teaching practice. It consisted of six tools of communication technology were used as tool. To examine that ICT is being used by B.ed trainees in teaching practice. To examine the extent of difficulty to use ICT during teaching practice. To analyze the attitude and practice of B.Ed trainees towards ICT. To identify the problems faced by B.Ed trainees in use of ICT during teaching. The major findings showed that there is no significant difference between the attitude and practice of B.Ed trainees towards ICT in terms to gender and locality.

Muthuchamy and Thiyagu (2010) conducted a study on higher secondary student's perception towards information and communication technology at the school level. The sample consisted of 300 plus one students from various higher secondary schools. The investigator developed and used a standardised questionnaire and the items given in the questionnaire were used for data collection. The major findings showed that there is no significant difference in perception towards information and communication technology between male & female students. There exists no significant difference between the students of government, aided andself financing school students in respect of their perception towards Information and communication technology.

Singaravela and Krishnan (2007). "ICT A Boon for higher education". Information and Communication technology is uniquely placed to generate the quality in higher education. The full benefit of technology in the educational process in realized only be enhancing the technology skills of faculty and students, ensuring accurate system support and providing the funds necessary to build a new academic framework around the new resources. Available resources can be utilized and implemented in the research work to promote the teamwork, global consciousness, self paced learning, self learning, problem solving and cognitive process.

Scott (2007) "Fluency with information and communication technology: Assessing undergraduate students." ICT has become indispensible in the daily lives of many. There is growing concern that despite having grown up with computers and the internet, today's college students may lack the preparation required to effectively use ICT in the 21st century. The purpose of this study was to assess the ICT in fluency of UG general education students and to describe their ICT fluency of UG general education. Students and to describe their ICT fluency when disaggregated by gender, race/ethnicity, class year, major and ICT educational experience participants in the study were 198 UG students enrolled in one of seven computer and information science(CIS) general education courses. The assessment instrument used was Educational Testing Services (ETS) ICT Literacy Assessment. A survey instrument, ICT fluency questionnaire was also developed. Results of this study have implications in ICT education assessment and curriculum development.

Nicolino and Peter (2007) “Teacher perceptions of learning styles assessment differentiated instruction, instructional technology and their willingness to adopt individualized instructional technology”. The purpose of this study was to investigate the factors that influence the integration of learning styles Assessment, Differentiated Instruction, and individualized instructional technology by teachers in the Kindergarten through sixth grade of long Island New York, in seven public school system that were connected to the internet. A survey instrument investigated the factors that influence of integration of learning styles, Differentiated Instruction, and individualised Instructional technology. The instrument gathered data regarding demo graphic information’s, teacher knowledge and comfort levels with regard to learning styles Assessment, Differentiated instruction, and instructional technology and their willingness adopt individualised instructional technology.

Kumar (2007) “Integration of ICT in Teaching Learning a challenge”. ICT helps in professional development of teaching and learning and individuals involved in the programmes of teacher education. It can be infused in the learning process. So as to acquire the knowledge and skill efficiently. ICT provides access to resources so that teachers can apply new knowledge and skills they have learned. Communication technology will be able to develop the capacity of the teacher educator and at the same time, can strengthen the capacity of teacher educator which is the fundamental requirement of effective transactional.

Khirwadkar's (2006) study on "Information and Communication Technology in Education- An integrated Approach" revealed the fact that ICT is becoming an integral part of educational reforms and innovations at secondary schools. The main suggestion of the study was to integrate technology to the teaching-learning process effectively. The present situation fails to integrate technology, pedagogy and content effectively. Non-availability of proper infrastructure facilities was found to be the main barrier regarding ICT integration.

Athaide (2005) has come out with the following findings, a majority of principals and teachers were found to have positive reaction to the integration of technology in teaching. Facilities alone do not ensure successful integration and adoption of computer technology. Barriers like lack of time, teacher's over loaded work, lack of technical knowledge, absence of internet connection, unavailability of computers, lack of skill and not having a PC at home can prevent the use of computer as a teaching tool. Beginner's course for teachers was much sought after by the participants.

Barot (2005) carried out a study on "ICT Enabled Teacher Education". Which stressed the need to incorporate technology to teaching the major finding of the study was that the teachers exhibited a love-hate relationship with technology. They love ICT as it made their jobs easy and they hate it as it constantly threatens to replace teachers.

Dhodi (2004) studied the "Approaches adopted by the M.Ed students of the MS University, Baroda for gathering information from the World Wide Web and their utility for the M.Ed programme". Most of the students were found to

have adequate technological aptitude. However, they have not been utilising the learning resources available on internet. None of them were found to be 'info-fluent'. There was a felt need of developing info- savvy skills in M.Ed students.

Rathod (2004) conducted a study on "Identification of the gaps amongst teaching styles and learning style at secondary level and bridging these gaps through technology". The study revealed the utility of various media, namely, computer multimedia, projecting and non-projecting media to address the needs of teachers and learners. In this investigation on "Effectiveness of Training Programme by Intel-India for Secondary School Teachers".

Goel, Das and Shelat (2003) conducted a study on "ICT in Education – A challenging Experience." The study was conducted to explore the perception of B.Ed students of Vadodara towards the course of ICT in education. The study revealed that B.Ed students had a Favourable attitude to the ICT course. All impeding factors such as limited staff, inadequate labs, maintenance problems, limited audio-visual aids, supportive facilities, sizeable class, lack of technological culture, attitude and climate were to be removed for satisfactory ICT integration.

Girish (2002) carried out a study on "Perception of B.Ed, students towards ICT in education". The entire sample of students 400 responded that ICT literacy camps should be organised for the teacher educators to develop adequate competencies with respect to ICT integration. A great majority (95%) of the

students responded that ICT in education is needed at B.Ed level as compulsory course.

Jain (2002) conducted a study on "IGNOU teleconferencing for distant learners". To analyses the effectiveness of teleconferencing in teaching distant learners. There were mixed response regarding the effectiveness of the teleconferencing programmes. The major findings showed that their programmes found existing and wonderful whereas others could not utilize these programmes properly. Proper co-ordination was also to found to be lacking utilization of learning resources and facilities were not satisfactory.

Gracious (2001) conducted a study to "learning skills and ICT awareness of prospective B.Ed teachers." The sample consisted of 242 prospective B.Ed teachers studying in colleges of education affiliated to the Tamil Nadu Teachers education university in Tirunelveli, Thoothukudi and Kanyakumari Districts. Learning skills scale and ICT Awareness scale developed by the investigators were used as tools. The major findings showed that there is no significant difference between above 22 and below 22 years old prospective B.Ed teachers in their learning skills. There is no significant difference between Under Graduate & Post Graduate prospective B.Ed teachers in their learning skills.

Deepak (2001) revealed "A study of prospect and Applicability of computer in education in the secondary school of Eastern up". Majority of the schools have supplementary time-table and indicated three periods for practical work. 24

percent of the secondary schools have computer facilities. No financial supports provided by Government for the maintenance of the computers.

STUDIES IN ABROAD

Kumar, Chandrakar and Yadav (2010) "ICT awareness, Use and Need for Teacher Educators" For the present study, the sample of the study consisted of 22 (14 males and 8 females) from university teacher educators and 88 (23 males and 65 females) from colleges teacher educators. To study the ICT awareness and need of university and college teacher educators. The major findings show that there is no significant difference in ICT awareness and need between university and college teacher educators.

Joshi (2008) described in "Integrating ICT in M.Ed programme: An experience "-his experience of integrating technology in the M.Ed programme at Bhavanagar university. The description is in terms of the course content, schedule, evaluation, student's and teacher's experience, and the outcome in terms of what has been gained in general.

Sarasami (2007), indicate in his research, "The attitude of teacher trainers towards the teaching computer Education at B.Ed level" that the introduction of computer education in teacher education is most necessary and the contents are more relevant to the teaching learning process. The level of satisfaction towards the introduction of computer education is very high. The trainees are confident of using computers and internet facilities, mostly teaching learning

process, project collaboration, learning by doing and purpose and are of software package of MS office.

Johnson (2007) surveyed the attitudes towards micro computers in learning. It revealed the introduction of micro computers in schools was a highly significant innovation. The survey also revealed that the micro computers radically enhanced the quality of education. The major objectives were to determine the attitudes of the Kwaiti teachers and decision makers toward computer application at the secondary school level; and their level of knowledge and experience about the instructional value of computers in their classroom 500 teachers were included in this study and conducted that sex of teachers has no influence on their perceptions on the use of computers in the classroom; there is no association between the position of the participants and their degree of involvement in the development of CAI programme for in-service training. A significant number of teachers felt that increased computer use in school would have a negative impact on their salaries.

Sheela (2006) studied the relationship between knowledge of ICT and attitude to the inclusion of ICT in teacher education among teacher educators in terms of level of knowledge of ICT, length of experience, gender, type of institution and subject of teaching. It is formed that the level of knowledge is positively related to attitude; length of experience is negatively related; gender and subject of specialisation do not have any bearing.

Hramiak (2006) conducted a study in ICT i.e., a pedagogical frame work for the use of ICT in initial to training. This paper describes the initial findings of a longitudinal case study that investigates the use of e-learning and communication technology to enhance the placement experience for full time post Graduate Certificate in Education (PGCE) students.

Rorai (2004) conducted a quasi experimental study; computer anxiety and attitudes of urban teacher education students. The study conducted that difference between the means of computer liking and computer usefulness was not significant, the addition of computer usefulness of locus of control to explain the variance in post test computer anxiety was not significant and, no significant difference between treatments were found for computer anxiety, computer assisted confidence and computer liking.

Sutherland and Rosemund (2004) "Designs for learning ICT and knowledge in the classroom". It draws on the preliminary results of the Interactive Education which is concerned with learning within the subject areas of English, History, Geography, Mathematics, Music, modern foreign languages and Science. It is predicated on the view that ICT alone does not enhance learning.

Job (2003) studied on 'Computer literacy.' He implied the general awareness about computer such as what they are, their scope and significance and how it influence to equip our society which is preparing to step in to the 21st century.

Lerner (2003) conducted a study on "Teacher with limited computer knowledge" to identify the most important variables that determine the degree

to which teachers with limited computer knowledge use computer in classroom. The major findings show that knowledge, anxiety, personal attitude, professional attitude, school and school resources were the important variables that influenced teacher's competency. Anxiety proved to be the variable with strongest correlation with computer use in teacher with limited computer knowledge.

Gleman and Melmed (2002) conducted a survey on "Fostering the use of Educational Technology". Educational technology has significant potential for improving students learning. Learning takes place in less time. Learners work at their own place and convenience. Learner motivation is triggered and they are offered with extensive practice.

Yen (2002) "Gender difference in Teacher Computer Acceptance". The result of the study indicated that significant gender difference exists in teachers" computer acceptance. Males were more ready to accept the in thence of computer is teaching that females. The male teachers appeared to be more "techno savvy" than their female counterparts.

Cox (2002) conducted a study on "The factors which support or prevent Teachers from using ICT in their classrooms." The factors like providing professional support to teachers through internet, giving more power to the teacher in the school, allowing greater access to computers for personal use, making teacher's administration more efficient were found to be important in influencing teacher's to use ICT in classrooms.

Hena (2002) conducted a study about computer awareness of student teachers and teacher educators of the college of teacher education in Kerala. The findings of the study were student teachers and teacher educators have average computer awareness and computer operating skill. The four variables via; gender, subjects, education qualification and type of management are not play a significant role in causing computer awareness and operating skill among student teacher educators.

Murphy and Greenwood (2001) conducted a study on "Effective integration of Information and Communication Technology in teacher Education" The study identified three policy adopted by initial teacher training provides and lack of encouragement for students to use ICT in teaching practice.

Stokers (2001) are his article, "The role of ICT Education: states; ICT has made more of an impact on education than most teachers realize. Unfortunately, not all students are online, but the percentage is growing in an increasing diversity of place and social strata. In their educational environment, students tend to incorporate technology in their preparation at all levels-primary, secondary and tertiary' the article points out that younger teachers are more willing to integrate technology with the new trends in technology and more interested to use it. Whereas older teaches feel frustrated by the new technology and take too much time to learn and use it.

Mumtaz (2000) had a study on "Factors that influence teacher's decision to use ICT in the classroom." The study emphasised the role of teacher's belief

about teaching and learning with ICT as central to integration. The main suggestion was that successful implementation of ICT depended upon three interlocking frame works-the teacher, the school and the policy makers.

Russell and Bradky (2000) conducted an investigation on "Teachers Computer Anxiety" through a questionnaire survey of 350 Australian Primary and Secondary school teachers. The survey, Barriers like lack of time, teachers over loaded work, lack of technical knowledge, absence of internet connection, unavailability of computers, lack of skill and not having a PC at home can prevent the use of computer as a teaching tool. Beginner's course for teachers was much sought after by the participants.

CRITICAL REVIEW

In the present study the investigator reviewed 17 studies conducted in India and 18 studies conducted abroad related to ICT. Most of the researcher conducted studies related to ICT in subject wise and other field. The study reviewed here has provided the necessary information in framing the hypothesis for the present investigation and to locate comparative data, useful in the interpretation of results.

CHAPTER – III

METHODOLOGY

- Introduction
- Section A: Test Development
- Section B: Plan and Procedure

Research in common refers to a search for knowledge. One can also define research as a scientific and systematic search for pertinent information on a specific topic. Research is an act of scientific investigation. The Advanced Learner's Dictionary of current English lays down the meaning of research as "a careful investigation or inquiry especially through search for new facts in any branch of knowledge". Redman and Mory (1923) "Research as a systemized effort to gain new knowledge".

Research is an academic activity and as such the term should be used in a technical sense. Research comprises defining and redefining problems, formulating hypothesis or suggested solutions, collecting, organizing and evaluating data, making deductions and researching conclusions, and last carefully testing the conclusions to determine whether they fit the formulating hypothesis.

For a systematic research, Methodology is essential. Methodology is a technique adopted for an orderly arrangement of factors and principles. Methodology guides a lot in doing research along a successful path. It helps to avoid waste of time, money, efforts and shows the methods to raise the efficiency and dignity of the research. Thus the success of any research depends largely on the stability of method used for the study.

The methodology may vary from problem. The purpose may vary from researcher to researcher. It should be feasible, pre-planned and well industrialized.

This chapter was divided into two sections,

Section A - Test development

Section B - Plan and Procedure

SECTION A

TEST DEVELOPMENT

Collection of relevant data is one of the important steps in any research especially in the field of education. An appropriate tool or instrument is very essential to serve this purpose.

In the present study a thorough study of the related literature on the variable helped the investigator to develop the present tool. The tool ‘ICT

Perception Scale' employed prospective teachers' for the present study is constructed and validated by Jimi.I.B and Mrs. Bindu Gouri.V.P (2014) for measuring the perception of prospective teachers towards utility of ICT in teaching-learning process. For preparing the tool certain important consideration and procedures were followed. The major steps in the consideration of this tool are described under different heads.

CONSTRUCTION OF THE TOOL

1) Planning of the test
2) Tool development
3) Item writing
4) Item editing
5) Arrangement of items
6) Preliminary try out (Try out-I)
7) Draft scale
8) Final try out (Try out-II)
9) Scoring
10) Item analysis
11) Item selection
12) Formate of the final scale
13) Reliability and validity of the scale.
14) Face validity.

1) **Planning of the test**

The ICT Perception Scale prepared by Jimi and Bindu Gouri (2014) aims at measuring the perception of prospective teachers towards the utility of ICT in teaching-learning process in Kanyakumari District.

2) **Tool development**

The basic requirement for any educational or psychological research is the availability of a reliable, valid and standardized tool. As the study is intended to measure the perception of prospective teachers towards the utility of ICT in teaching-learning process, the investigator constructed and validated an ICT Perception Scale to measure the perception of prospective teachers towards the utility of ICT in teaching-learning process.

3) **Item writing or Item preparation**

The important step in the construction of any research tool is writing of suitable item after a thorough and careful study of the literature available on ICT utility. The investigator collected materials on different aspects of ICT utility and prepared a large number of statements describing ICT utility.

The scale covers the decisive features of the needed data. The method used in item writing was the fixed response method. The respondents must select one response out of the given responses “Strongly Agree, Agree, Undecided, Disagree, and Strongly Disagree”. The prepared items are then given for item editing.

4) Item editing

Editing the items needs much care and it is the process of checking and scrutinizing for modification. As per the suggestion, ambiguous items were rewritten in simple and meaningful language.

5) Item arrangement

All the items were then arranged in a random manner including almost equal number of positive and negative items for the ICT utility scale.

6) Preliminary Tryout

The preliminary try out of the test was arranged to find out the weakness and workability of the items. The difficulties in responding to the items and a rough estimate of the time limit for responding to the items were noted. This step helped the investigator to modify certain items which were vague and questionable. For this purpose the scale was given to 100 prospective teachers. Some ambiguous items were modified and the draft scale was prepared.

7) Draft scale

The first draft was prepared by printing the item with the provisions to make responses. A simple copy of the draft scale is given in Appendix-B.

8) Final Try out (Try out-II)

The tool was administrated to a sample of 400 prospective teachers of various colleges of Kanyakumari District.

9) Scoring

The collected response sheets were scored with the help of a scoring key prepared by the investigator. The response sheets were scored by assigning a score of Strongly Agree'5', Agree'4', Undecided'3', Disagree'2', Strongly disagree'1'.

10) Item analysis

Item analysis is an important step in a test construction. Item can be analyzed qualitatively interms of their content and quantitatively it terms of their statistical properties. Qualitatively analysis includes the consideration of content validity and the evaluation of items in terms of effective item writing procedures.

Quantitative analysis on the other hand includes principle, the measurement of item difficulty and item discrimination. Both the validity and reliability of any test depend ultimately on the characteristics of the items. Higher reliability and validity can be built into a test in advance through item analysis.

The method of item analysis used in the case of present investigation is the one developed by Mathew (1982) called the Mathew Item Analysis Table. This table gives item criterion correlation (phi-coefficient) and percentages of tests marking the keyed answer (p value). One of the advantages of phi-coefficient is that any convenient tail proportion can be made use of in order to use the same table. It is recommended regardless of the sample size.

The response sheets were arranged in the order of the criterion score. The criterion score is the total score of the trial form of the test itself. Hundred response sheets having the lowest score were taken forming the lower tail. The final percentage needed for reading the item indices from the table are the following,

P_L is the percentage of individuals in the lower tail marking the keyed answer.

P_U is the percentage of individuals in the upper tail marking the keyed answer.

In the 'Mathew Item Analysis Table" all indices for the same values of P_L have been grouped together. So in order to read the indices of an item, the P_L value of the given item was located first, then in that selection of the P_U value of the item along the left margin was located and the corresponding phi and p values were read.

11) Item selection

From the items highest 'Phi' and medium 'P' values were selected. The special feature about the Phi value is that since 'Phi' values tend to be high for items having medium 'P' value item selection based on 'Phi' alone would give the desired result. Items with 'Phi' values below the 5 percent level of significance are not considered usually.

When 'Phi' values of most items were high and the number of items large, items with some spread of 'P' values would be desirable. It may be

mentioned here that 'Phi' values were computed for every combination of P_L and P_U values of Guilford (1954) formula.

Table 3.1

Details of the items selected and rejected are given in the following.

Item	Lower Score	Upper score	Phi value	P value	Selected item
1	84	86	0.03	85	*
2	19	38	0.10	29	*
3	64	83	0.22	74	Selected
4	42	59	0.17	51	Selected
5	66	84	0.21	75	Selected
6	31	49	0.18	40	Selected
7	67	80	0.15	74	Selected
8	32	48	0.16	40	Selected
9	84	90	0.09	87	*
10	27	28	0.01	28	*
11	72	84	0.15	78	Selected
12	65	80	0.17	73	Selected
13	39	58	0.19	49	Selected
14	72	84	0.15	78	Selected
15	40	57	0.17	49	Selected

16	42	61	0.19	52	Selected
17	70	89	0.24	80	Selected
18	34	48	0.14	41	Selected
19	59	79	0.22	69	Selected
20	44	63	0.18	54	Selected
21	50	75	0.25	63	Selected
22	31	39	0.08	35	*
23	60	76	0.17	68	Selected
24	67	71	0.04	69	*
25	71	85	0.17	78	Selected
26	67	85	0.21	76	Selected
27	64	82	0.20	73	Selected
28	50	66	0.16	58	Selected
29	63	70	0.07	67	*
30	39	32	0.07	44	*
31	47	62	0.15	55	Selected
32	41	59	0.18	50	Selected
33	69	77	0.09	73	*
34	70	83	0.15	77	Selected
35	38	55	0.17	47	Selected
36	61	74	0.04	67	*
37	48	65	0.17	57	Selected

38	68	81	0.15	75	Selected
39	52	77	0.26	65	Selected
40	46	67	0.21	57	Selected
41	80	91	0.16	86	Selected
42	32	52	0.20	42	Selected
43	27	28	0.01	28	*
44	54	73	0.20	64	Selected
45	42	56	0.14	49	Selected
46	65	79	0.06	72	*
47	33	51	0.18	42	Selected
48	58	73	0.16	66	Selected
49	36	55	0.19	46	Selected
50	67	84	0.20	76	Selected
51	35	54	0.19	45	Selected
52	50	75	0.06	63	*
53	52	78	0.27	65	Selected
54	56	71	0.16	64	Selected
55	57	76	0.10	67	*
56	54	76	0.23	65	Selected

***Rejected items are marked with asterisk.**

12) Formate of the final scale

The final scale consisted of 42 items. A copy of the final scale is attached in Appendix-C

13) Reliability and Validity of the scale

Split half method was used to find the reliability coefficient of the scale. The value of the reliability coefficient, stepped up by the Spearmen Brown formula was 0.9839 the correlation is high and significant at 0.01 level, the tool is reliable 0.9839.

14) Face validity

Face validity means, that the given tool appears or scores to measure what it measure. The tool was submitted to a panel of experts and in their opinion it appeared to measure the relevant objectives of the tool. A close look on the items of the scale reveals that each and every item is capable of measuring the perception of prospective teachers towards the utility of ICT in teaching-learning process. This provided the face validity of the tool.

Table 3.2

Number of sample	100
Number of items	42
Correlation between odd half and even half	0.9684
Reliability Coefficient	0.9839

To ensure validity, face validity method was adopted. The final form of the scale was submitted to the experts in the field. The ICT Perception Scale constructed by the investigator established its reliability and validity satisfactorily. The tool is now ready to be administered on a large sample selected for the study.

SECTION B

PLAN AND PROCEDURE

This section deals with the plan and procedures adopted for the study. Plan and Procedures gives an account of the method used for the study, sample selected for the study, tool used, administration of the tool, scoring and tabulation of the data collected and statistical techniques used in the study. A detailed description is as follows.

METHOD ADOPTED FOR THE PRESENT STUDY

The nature of the problem and the objectives framed for the study determines the method for collecting the required data. The method adopted should be in tune with scientific principles and adequate enough to provide valid generalization.

The study involves collection of data from a large representative sample. The investigator used survey method to collect data, as it can clearly tell what exists at present by determining the nature and degree of existing conditions.

Survey is an organized attempt to analyze, interpret and report the present status of a group (Good, 1954).

George J. Mouley (1963) has classified research methods into three basic types. They are,

1) Historical method
2) Experimental method
3) Normative survey method

1. HISTORICAL METHOD

It is a method of investigation to discover and interpret what existed in the past.

2. EXPERIMENTAL METHOD

Experimental research is the description and analysis of what will be or what will be or what will occur, under carefully controlled conditions.

3. NORMATIVE SURVEY METHOD

The word ‘survey’ indicates the gathering of data regarding current conditions. The word ‘Normative’ is used because surveys are frequently made for the purpose of ascertaining which is the normal or typical condition or practice “ Normative Survey” is applied in order to suggest the two closely related aspects of the study. The descriptive or Normative Survey method of educational research is very common. It is that method of investigation which attempts to describe and interpret, what exists at present in the form of conditions practices processes, attitude, beliefs etc. It is concerned with the

phenomena that are typical of the normal conditions. It is an organized attempt to analyze, interpret and report the present status of social institution group or area.

CHARACTERISTICS NORMAIVE SURVEY MEETTHOD

1) It gathers data from a relatively large number of cases.
2) It is essentially cross-sectional.
3) It is concerned not just with the characteristics of individuals but with generalized statistics of the whole population or a representive sample.
4) It is an important type of research involving clearly defined problem and definite objectives.
5) It provides information useful to the solution of local problems.
6) Survey may be qualitative or quantitative.
7) Descriptions resulting from surveys may be either verbal or expressed in mathematical symbols.
8) It is more realistic.
9) It requires expert imaginative planning.
10) It requires careful analysis and interpretation of the data.
11) It requires logical skill full reporting of the finding.
12) It is conducted in natural settings.

TOOLS USED FOR THE STUDY

Tools are devices used to collect relevant data for the study. The use of suitable tool is necessary to carry out a successful research.

The tools used in the present study where,

a) ICT Perception Scale (prepared by the investigator)
b) Personal data sheet.

Dimensions are,

1. ICT access for teaching
2. ICT based resources used for teaching
3. Knowledge Creation
4. Learning through ICT
5. Skills of ICT
6. Computer and Internet in Teaching and Learning
7. Application of ICT

ICT access for teaching

ICT accessibility is a term used to describe the degree to which ICT is accessible by as many people as possible.

ICT based resources used for teaching

Effective use of technology in education to change the face of education and create more educational opportunities. To benefit teacher and students.

Knowledge Creation

Formation of new ideas through interactions between explicit and tacit knowledge in individual human minds.

Learning through ICT

The use of ICT to motivate and engage the learners in the learning process.

Skills of ICT

ICT skills are the knowledge and ability to use communications technology.

Computer and Internet in Teaching and Learning

Teaching-learning process to provide students with the skills to function effectively in dynamic, information rich and continuously changing environment.

Application of ICT

ICT applications can support sustainable development, in the fields of public administration, business education and training health, employment, agriculture and science within the framework of national e-strategies.

a) ICT Perception Scale:

The ICT Perception Scale constructed and standardized by the investigator consists of 56 items covering the various dimensions of ICT usage by prospective teachers. Items are arranged by giving importance to the content. There are 31 positive and 25 negative items in the scale. Care has been taken to include almost equal number of favorable and unfavorable items in the scale. Each item in the scale has choices namely, Strongly Agree (SA), Agree (A), Undecided (UD), Disagree (D), Strongly Disagree (SD). Prospective teachers are asked to read the items and indicate their agreement or disagreement with the items by put a ( ) mark in the appropriate box given in the scale.

b) The personal data sheet:

The personal data sheet was prepared by the investigator to collect the personal details of prospective teachers, like age, gender, locality, and religion, type of management, optional subject, computer knowledge, educational qualification, and family monthly income. The copy of personal data sheet is given in Appendix-A.

THE SAMPLE

Sample of 400 prospective teachers was chosen randomly and to them the draft scale was administered individually. The investigator met the respondents, classified the purpose of the study, got their consent and gave clear instructions to fill in the scale appropriately. After completion the response sheets were collected back and were scrutinized for omissions.

The sample for the present study consisted of 400 prospective teachers. The investigator has, adopted simple stratified sampling method. The sample was selected in such a manner that is should be a representation of prospective teachers in terms of age, gender, locality, religion, type of management, optional subject, computer knowledge, educational qualification and family monthly income.

Table 3.3

Details about the sample selected for the study.

Background Characteristics		**Count**	**Percent**
Age	Below 20	67	16.75
	Below 30	297	74.25
	Above 30	36	9.00
Gender	Male	187	46.75
	Female	213	53.25
Locality	Rural	265	66.25
	Urban	135	33.75
Religion	Hindu	177	44.25
	Christian	189	47.25
	Muslim	34	8.50

Type of management	Aided	89	22.25
	Unaided	311	77.75
Optional subject	Arts	193	48.25
	Science	150	37.50
	Commerce	57	14.25
Computer knowledge	Yes	312	78.00
	No	88	22.00
Educational qualification	HSS	43	10.75
	UG	276	69
	PG	81	20.25
Monthly income	Below 10000	217	54.25
	Below 20000	121	30.25
	Above 30000	62	15.50

DETAILS OF THE SAMPLE

The data collected from the various professional college prospective teachers in Kanyakumari district have been distributed as follows.

Table 3.4

College wise distribution of the sample:

Sl.No	Name of the colleges	No. of students
1	White Memorial College of Education, Chevaracode	74
2	Immanuel Arasar College of Education, Nattalam	30
3	N.V.K.S.D College of Education, Attoor	89
4	Mar. Chrysostom College of Education, Kirathoor	73
5	DIET College of Education, Theroor	52
6	HolyTrainity College of Education, Melpalai	07
7	Christian College of Education, Marthandam	48
8	St.Stephen’s College of Education, Palavilai	04
9	Muslim College of Education, Thiruvithamcode	23

ADMINISTRATION OF THE TOOL

The investigator visited various colleges in the urban and rural areas of Kanyakumari District and met the prospective teachers to study their perception on utilizing ICT in teaching-learning process. They were informed about the purpose of the study. The investigator gained their consent to co-operate with the study.

To begin with, teachers were given the tool. The investigator gave clear instruction to the teachers regarding the mode of responding to the tool. On completion, the tool was collected back from teachers and subjected to scoring procedures.

SCORING PROCEDURE

The scoring procedure of the tool is as follows.

All the positive items were scored from maximum to minimum that is a score (weight) of 5, 4, 3, 2, and 1 was given to each category of SA, A, UD, D and SD of a positive item. The scoring pattern was reversed for negative items. The response sheet was not scored if there were more than one response category chosen for a particular item or if there were three or more omitted items. If there were one or two omitted items only, a score of 3 was given for each.

Table 3.5

SCORING KEY

Sl.No	SA	A	UD	D	SD
1	5	4	3	2	1
2	1	2	3	4	5
3	5	4	3	2	1
4	1	2	3	4	5
5	5	4	3	2	1
6	1	2	3	4	5
7	5	4	3	2	1
8	1	2	3	4	5
9	5	4	3	2	1
10	1	2	3	4	5
11	5	4	3	2	1
12	5	4	3	2	1
13	1	2	3	4	5
14	5	4	3	2	1
15	1	2	3	4	5
16	1	2	3	4	5
17	5	4	3	2	1
18	1	2	3	4	5
19	5	4	3	2	1
20	1	2	3	4	5
21	5	4	3	2	1
22	1	2	3	4	5

23	5	4	3	2	1
24	5	4	3	2	1
25	5	4	3	2	1
26	5	4	3	2	1
27	5	4	3	2	1
28	1	2	3	4	5
29	5	4	3	2	1
30	1	2	3	4	5
31	1	2	3	4	5
32	1	2	3	4	5
33	5	4	3	2	1
34	5	4	3	2	1
35	1	2	3	4	5
36	5	4	3	2	1
37	1	2	3	4	5
38	5	4	3	2	1
39	5	4	3	2	1
40	1	2	3	4	5
41	5	4	3	2	1
42	1	2	3	4	5
43	1	2	3	4	5
44	5	4	3	2	1
45	1	2	3	4	5
46	5	4	3	2	1
47	1	2	3	4	5
48	5	4	3	2	1
49	1	2	3	4	5
50	5	4	3	2	1
51	1	2	3	4	5
52	5	4	3	2	1
53	5	4	3	2	1
54	1	2	3	4	5
55	5	4	3	2	1
56	5	4	3	2	1

Table 3.6

RESPONSE SHEET

Sl.No	A	B	C	D	E
1					
2					
3					
4					
5					
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56					

STATISTICAL TECHNIQUES USED

Statistical techniques are very important for any research. The relevant statistical techniques help the investigator to analyze and interpret the data meaningfully in the study.

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

i) Arithmetic Mean

ii) Standard Deviation

iii) Test of significance (t-test)

iv) Analysis of Variance (ANOVA)

v) Scheffe's Procedure

vi) Pearson's product moment correlation

i) Arithmetic Mean:

Mean is the most reliable and universally used central tendency. Mean is the simplest and can be defined as the sum of all the values of item in a series divided by the number of items. Mean is calculated using the formula

$$\textbf{Arithmetic Mean} \quad \bar{X} = \mathbf{A} + \frac{\sum fd}{N} \times \mathbf{C}$$

Where,

$\bar{X}$ = Arithmetic mean

A = Assumed mean of the scores

f = Frequency of the scores

d = Derivation form the mean

N = Total sample

C = Class interval of the scores

ii) Standard Deviation:

Standard deviation is the most stable index of variability. It is defined as the square root of the average of the squares of the deviations of each score from the mean.

Standard Deviation $\boldsymbol{\sigma = \sqrt{\frac{\sum fd^2}{N} - \left(\frac{\sum fd}{N}\right)^2} \times C}$

Where,

σ = Standard deviation

C = Class Interval

d = Deviation from the sample

d^2 = square of deviation of score from the assumed mean

f = Frequency of each class.

N = Total sample

iii) t-test (test of significance):

It is used for finding significant level of difference between two groups of population. From the mean and standard deviation‘t’ value can be calculated.

The t-test is calculated using the formula

$$t = \frac{M_1 - M_2}{\sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}}$$

Where,

M_1 = Arithmetic mean of the first sample

M_2 = Arithmetic mean of the second sample

σ_1 = Standard deviation of the first sample

σ_2 = Standard deviation of the second sample

N_1 = Size of the first group

N_2 = Size of the second group

iv) Analysis of variance (ANOVA):

The analysis of variance (ANOVA) is used when there is any significant difference between more than three groups. This is calculated by the F-distribution of samples.

$$\text{F-ratio} = \frac{\textbf{Mean square variance between groups}}{\textbf{Mean square variance within groups}}$$

$$\mathbf{F} = \frac{\mathbf{V_b}}{\boldsymbol{V_w}}$$

Here, $\boldsymbol{V_b = V_t - V_w}$

Where,

V_b – Mean square variance between groups

V_w – Mean square variance within groups.

V_t – Means square variance of total groups

v) Scheffe's procedure:

A significant F, obtained as the results of ANOVA, does not point out which of the three groups differ among themselves. In such cases, the comparison of the differences between means for any two groups is done using Scheffe's procedure (Scheffe's, 1957). Scheffe's test is one of the well known multiple group comparison tests.

vi) Pearson's product moment correlation:

Pearson's product moment correlation was used to determine the relationship between the variables.

$$r = \frac{N(\sum xy) - (\sum x)(\sum y)}{\sqrt{\left[N\sum x^2 - (\sum x)^2\right][N\sum y^2 - (\sum y)^2]}}$$

Where,

N = Total number of paired scores

$\sum x$ = Sum of x scores

$\sum y$ = Sum of the y scores

$\sum x^2$ = Sum of the squared x scores

$\sum y^2$ = Sum of the squared y scores

CHAPTER IV

ANALYSIS AND INTERPRETATION OF DATA

- Introduction
- Percentage wise Analysis
- Differential Analysis
- Tenability of Hypotheses

This chapter gives the analysis and interpretation of the data collected through the administration of perception of prospective teachers towards the utility of ICT in teaching-learning process.

After the research design has been implemented and the data collected the next focus of attention is analysis and interpretation of data. Wilkinson and Bahndarkar (1977) said" analysis of data involves a number of closely related operations that are performed with the purpose of summarizing the data obtained and organizing these in such a manner that they will yield answers to the research questions or to suggest hypotheses or questions if no such questions or hypotheses had initiated the study".

Francis Rummel has said" the analysis and interpretation of data involves the objective materials in the possession of the researcher and his subjective reactions and desires of desire the data, the inherent meanings in their relation to the problem.

To avoid making conclusion or interpretation from insufficient or invalid data, the final analysis must be anticipated in detail when plans are being made for collecting information. The problem should be analyzed in detail to see what are necessary for its solution and it should be assured that the method used will provide for definite answers. The researcher must determine whether or not the factors chosen for study will satisfy all the conditions of the problem and if the source used will provide the required data. The statistical techniques used for analysis of data in this study are arithmetic mean, standard deviations, t-test, ANOVA, Scheffe's procedure and Pearson's product moment correlation. The details of the analysis are given in the succeeding pages, under appropriate heads.

PRELIMINARY ANALYSIS

PERCEPTION OF PROSPECTIVE TEACHERS TOWARDS THE UTILITY OF ICT IN TEACHING-LEARNING PROCESS.

Table: 4.1

Descriptive Statistics for perception.

Mean scores and standard deviation of perception of prospective teachers.

Mean	135.04
Standard Deviation	12.26
Count	400

From the table 4.1, it is clear that the total number of sample selected for the present study was 400. The arithmetic mean scores obtained for the total sample is 135.04 and standard deviation is 12.29.

Percentage distribution of different levels of perception of prospective teachers towards the utility of ICT.

Table: 4.2

Perception	Count	Percent
Low	47	11.75
Medium	294	73.50
High	59	14.75
Total	400	100.00

From the table 4.2, it is clear that the number of sample according to low, medium and high levels of perception is 47, 294and 59 and the corresponding percentages are 11.75, 73.50 and 14.75 respectively. This indicates that most of the prospective teachers have medium level of perception towards the utility of ICT in teaching-learning process.

FINAL ANALYSIS

Sub Sample Wise Comparison

a) Comparison of perception prospective teachers towards the utility of ICT based on Age.

Null Hypotheses: 1

There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on age.

Table: 4.3

Comparison of perception based on Age

Age	Mean	SD	Source	Sum of Squares	df	Mean Square	F	p	Remark
Below 20	141.01	13.81	Between Gp	2910.93	2	1455.47	10.13	0.000	**Sig. at 0.01 level**
Below 30	133.72	11.51	Within Gp	57040.43	397	143.68			
Above 30	134.81	12.25	Total	59951.36	399				

From the above table, the calculated value ($F=10.13$, $P<0.01$) is significant at 0.01 level. Therefore the null hypothesis “There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process” is rejected. It shows

that there exists significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on age.

The result does not help to identify exactly the pair of group which differs significantly. Hence Scheffe's multiple comparison is used for further analysis.

Table: 4.3.1

Age	N	P	P(Scheffe)	Remark
Below 20 (A)	67	A Vs B	0.000	Sig. at 0.01 level
Below 30 (B)	297	B Vs C	0.876	NS
Above 30 (C)	36	A Vs C	0.045	Sig. at 0.05 level

Note: NS-Not Significant

The result showed that the two pair Below 20 and Below 30 (A Vs B) and Below 30 and Above 30 (B Vs C) do not differ in their perception of the utility of ICT by prospective teachers. The other pair Below 20 and Above 30 (A Vs C) have significant difference in their perception of utility of ICT by prospective teachers. The prospective teachers in the age group 'below 20' perceived ICT utility in teaching-learning more favourable (mean value 141.01) than the age groups 'below 30' and 'above 30'.

b) Comparison of perception prospective teachers towards the utility of ICT based on Gender.

Null Hypotheses: 2

There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on gender.

Table: 4.4

Comparison of perception based on Gender

Gender	Mean	SD	N	t	p	Remark
Male	135.88	14.73	187	1.25	0.214	NS
Female	134.31	9.55	213			

Note: NS-Not Significant

From the above table, the calculated value (t=1.25, P>0.01) is not significant at any level. Therefore the null hypothesis "There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process" is accepted. It shows that there exists no significant difference among the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on gender.

c) Comparison of perception prospective teachers towards the utility of ICT based on Locality.

Null Hypotheses: 3

There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on locality.

Table: 4.5

Comparison of perception based on Locality

Locality	Mean	SD	N	t	p	Remark
Rural	134.56	11.73	265	1.06	0.289	NS
Urban	135.99	13.22	135			

Note: NS-Not Significant

From the above table, the calculated value (t=1.06, P>0.05) is significant at 0.05 level. Therefore the null hypothesis "There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process" is accepted. It shows that there exists no significant difference among the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on locality.

d) Comparison of perception prospective teachers towards the utility of ICT based on Religion.

Null Hypotheses: 4

There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on religion.

Table: 4.6

Comparison of perception based on Religion

Religion	Mean	SD	Source	Sum of Squares	df	Mean Square	F	p	Remark
Hindu	136.94	13.56	Between Gp	1764.1	2	882.07	6.02	0.003	Sig. at 0.01 level
Christian	134.23	10.11	Within Gp	58187.2	397	146.57			
Muslim	129.62	14.14	Total	59951.4	399				

From the above table, the calculated value ($F=6.02$, $P<0.01$) is significant at 0.01 level. Therefore the null hypothesis "There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process" is rejected. It shows that there exists significant difference in the mean scores of perception of

prospective teachers towards the utility of ICT in teaching-learning process based on religion.

The result does not help to identify exactly the pair of group which differs significantly. Hence Scheffe's multiple comparison is used for further analysis.

Table: 4.6.1

Religion	N	Pair	P (Scheffe)	Remark
Hindu (A)	177	A Vs B	0.103	NS
Christian (B)	189	B Vs C	0.125	NS
Muslim (C)	34	A Vs C	0.006	Sig. at 0.01 level

Note: NS-Not Significant

The result showed that the two pair Hindu and B Christian (A Vs B) and Christian and Muslim (B Vs C) do not differ in their perception of utility of ICT by prospective teacher. The other pair Hindu and Muslim (A Vs C) have significant difference in their perception of utility of ICT by prospective teachers. The mean value (136.94) shows that Hindu prospective teachers possess more favorable in the perception of utility of ICT by prospective teachers than Christian and Muslim other religion prospective teachers.

e) Comparison of perception prospective teachers towards the utility of ICT based on Type of management.

Null Hypotheses: 5

There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on type of management.

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Table: 4.7

Comparison of perception based on Type of management

Type of management	Mean	SD	N	t	p	Remark
Aided	139.92	13.90	89	3.90	0.000	Sig. at 0.01 level
Unaided	133.64	11.39	311			

From the above table, the calculated value (t=3.90, P<0.01) is significant at 0.01 level. Therefore the null hypothesis "There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process" is rejected. It shows that there exists significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on type of management.

f) Comparison of perception of prospective teachers towards the utility of ICT based on Optional subject.

Null Hypotheses: 6

There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on optional subject.

Table: 4.8

Comparison of perception based on Optional subject

Optional Subject	Mean	SD	Source	Sum of Squares	df	Mean Square	F	p	Remark
Arts	136.16	12.62	Between Gp	1025.68	2	512.84	3.46	0.033	Sig. at 0.05 level
Science	135.01	11.9	Within Gp	58925.7	397	148.43			
Commerce	131.33	11.39	Total	59951.4	399				

From the above table, the calculated value ($F=3.46$, $P<0.05$) is significant at 0.05 level. Therefore the null hypothesis “There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process” is rejected. It shows that there exists significant difference in the mean scores of perception of

prospective teachers towards the utility of ICT in teaching-learning process based on optional subjects.

The result does not help to identify exactly the pair of group which differs significantly. Hence Scheffe's multiple comparison is used for further analysis.

Table: 4.8.1

Optional Subject	N	Pair	P (Scheffe)	Remark
Arts (A)	193	A Vs B	0.687	NS
Science (B)	150	B Vs C	0.153	NS
Commerce (C)	57	A Vs C	0.032	Sig. at 0.05 level

Note: NS-Not Significant

The result showed that the two pair Arts and Science (A Vs B) and Science and Commerce (B Vs C) do not differ in their perception of utility of ICT by prospective teacher. The other pair Arts and Commerce (A Vs C) have significant difference in their perception of utility of ICT by prospective teachers. The mean value (136.16) shows that Arts prospective teachers are more favorable about the perception of utility of ICT than Science and Commerce other group prospective teachers.

g) Comparison of perception prospective teachers towards the utility of ICT based on Computer knowledge.

Null Hypotheses: 7

There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on computer knowledge

Table: 4.9

Comparison of perception based on Computer knowledge

Computer knowledge	Mean	SD	N	t	p	Remark
Yes	134.65	11.92	312	1.12	0.26	NS
No	136.42	13.36	88			

Note: NS-Not Significant

From the above table, the calculated value (t=1.12, P>0.01) is not significant at any level. Therefore the null hypothesis "There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process" is accepted. It shows that there exists significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on computer knowledge.

h) Comparison of perception prospective teachers towards the utility of ICT based on Educational Qualification.

Null Hypotheses: 8

There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on educational qualification.

Table: 4.10

Comparison of perception based on Educational Qualification

Ednl Qualfn	Mean	SD	Source	Sum of Squares	df	Mean Square	F	p	Remark
HSS	145.40	13.73	Between Gp	5232.26	2	2616.13	18.98	0.00	Sig. at 0.01 level
UG	134.03	11.1	Within Gp	54719.10	397	137.83			
PG	133	12.71	Total	59951.4	399				

From the above table, the calculated value ($F=18.98$, $P<0.01$) is significant at 0.01 level. Therefore the null hypothesis "There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process" is rejected. It shows that there exists significant difference in the mean scores of perception of

prospective teachers towards the utility of ICT in teaching-learning process based on educational qualification.

The result does not help to identify exactly the pair of group which differs significantly. Hence Scheffe's multiple comparison is used for further analysis.

Table: 4.10.1

Ednl Qualfn	N	Pair	P (Scheffe)	Remark
HSS (A)	43	A Vs B	0.000	Sig. at 0.01 level
UG (B)	276	B Vs C	0.786	NS
PG (C)	81	A Vs C	0.000	Sig. at 0.01 level

Note: NS-Not Significant

The result showed that the two pair HSS and UG (A Vs B) and UG and PG (B Vs C) do not differ in their perception of utility of ICT by prospective teacher. The other pair HSC and PG (A Vs C) have significant difference in their perception of utility of ICT by prospective teachers. The mean value (145.40) shows that HSS prospective teachers are more favorable about the perception of utility of ICT by prospective teachers than UG and PG group prospective teachers.

i) Comparison of perception prospective teachers towards the utility of ICT based on Family monthly income.

Null Hypotheses: 8

There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on family monthly income.

Table: 4.11

Comparison of perception based on Family monthly income

Monthly Income	Mean	SD	Source	Sum of Squares	df	Mean Square	F	p	Remark
Below 10000	135.71	12.38	Between Gp	218.05	2	109.02	0.72	0.485	NS
Below 20000	134.32	13.03	Within Gp	59733.31	397	150.46			
Above 20000	134.08	10.1	Total	59951.4	399				

Note: NS- Not Significant

From the above table, the calculated value (F=0.72, P>0.01) is not significant at any level. Therefore the null hypothesis "There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process" is accepted. It shows

that there exists significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on family monthly income.

TENABILITY OF HYPOTHESES:

1) The hypotheses," There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process" based on age is rejected.
2) The hypotheses," There exists no significant difference in the mean scores of perception towards the ICT by prospective teachers based on gender is accepted".
3) The hypotheses," There exists no significant difference in the mean scores of perception towards the ICT by prospective teachers based on locality is accepted".
4) The hypotheses," There exists no significant difference in the mean scores of perception towards the ICT by prospective teachers based on religion is rejected".
5) The hypotheses," There exists no significant difference in the mean scores of perception towards the ICT by prospective teachers based on type of management is rejected".

6) The hypotheses," There exists no significant difference in the mean scores of perception towards the ICT by prospective teachers based on optional subject is rejected".
7) The hypotheses," There exists no significant difference in the mean scores of perception towards the ICT by prospective teachers based on computer knowledge is accepted".
8) The hypotheses," There exists no significant difference in the mean scores of perception towards the ICT by prospective teachers based on educational qualification is rejected".
9) The hypotheses," There exists no significant difference in the mean scores of perception towards the ICT by prospective teachers based on family monthly income is accepted".

CHAPTER- V

FINDINGS, CONCLUSION AND SUGGESTIONS

- The study in Retrospect
- Findings
- Conclusions
- Educational Implications
- Suggestions for further research

THE STUDY RETROSPECT

The study under investigation is entitled as “Perception of Prospective Teachers towards the Utility of ICT in Teaching-Learning Process in Kanyakumari District”. In this chapter an attempt is made by the Investigator to summarize all the findings and conclusions drawn from the study. The suggestion for further researchers is also given.

STATEMENT OF THE PROBLEM

The problem selected for the present study is entitled as “**PERCEPTION OF PROSPECTIVE TEACHERS TOWARDS THE UTILITY OF ICT IN TEACHING-LEARNING PROCESS IN KANYAKUMARI DISTRICT”.**

OBJECTIVES OF THE STUDY

11) To study the perception of prospective teachers towards the utility of ICT in teaching-learning process.

12) To study the significant difference, in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on Age.

13) To study the significant difference, in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on Gender.

14) To study the significant difference, in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on Locality.

15) To study the significant difference, in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on Religion.

16) To study the significant difference, in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on Type of management.

17) To study the significant difference, in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on Optional subject.

18) To study the significant difference, in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on Computer knowledge.

19) To study the significant difference, in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on Educational qualification.

20) To study the significant difference, in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on Family monthly income.

HYPOTHESES RESTATED FOR THE STUDY

The null hypotheses formulated for this study are following.

10) There exists no significant difference in the mean scores of the perception of prospective teachers towards the utility of ICT in teaching-learning process based on Age.

11) There exists no significant difference in the mean scores of the perception of prospective teachers towards the utility of ICT in teaching-learning process based on Gender.

12) There exists no significant difference in the mean scores of the perception of prospective teachers towards the utility of ICT in teaching-learning process based on Locality.

13) There exists no significant difference in the mean scores of the perception of prospective teachers towards the utility of ICT in teaching-learning process based on Religion.
14) There exists no significant difference in the mean scores of the perception of prospective teachers towards the utility of ICT in teaching-learning process based on Type of management.
15) There exists no significant difference in the mean scores of the perception of prospective teachers towards the utility of ICT in teaching-learning process based on Optional subject.
16) There exists no significant difference in the mean scores of the perception of prospective teachers towards the utility of ICT in teaching-learning process based on Computer knowledge.
17) There exists no significant difference in the mean scores of the perception of prospective teachers towards the utility of ICT in teaching-learning process based on Educational qualification.
18) There exists no significant difference in the mean scores of the perception of prospective teachers towards the utility of ICT in teaching-learning process based on Family monthly income.

METHODOLOGY IN BRIEF

The present study was undertaken to assess the perception of prospective teacher towards the utility of ICT in teaching-learning process. The sample comprised of 400 prospective teachers from KanyaKumari District. Normative survey method was adopted in the present study. Tool used in the present study were ICT perception scale for prospective teachers and personal data sheet. After the data collection of the data, the sample were subjected to different types of statistical treatments like arithmetic mean, standard deviation, t-test, ANOVA, Scheffe's procedure and Pearson's product moment correlation.

MAJOR FINDINGS OF THE PRESENT STUDY

The following are the important findings of the present investigation.

1) Constructed and validated the ICT perception scale for measuring the use of ICT in

   teaching-learning process by prospective teachers.
2) There exists significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on their age. This findings is supported by the following result (F value=10.13, which is significant at 0.01 level).

3) There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on their gender. This findings is supported by the following result (t value=1.25, which is not significant at any level).
4) There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on their locality. This findings is supported by the following result (t value=1.06, which is not significant at any level).
5) There exists significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on their religion. This findings is supported by the following result (F value= 6.02, which is significant at 0.01 level).
6) There exists significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on their type of management. This findings is supported by the following result (t value=3.90, which is significant at 0.01 level).
7) There exists significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on their optional subjects. This findings is supported by the following result (F value=3.46, which is significant at 0.01 level).

8) There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on their computer knowledge. This findings is supported by the following result (t value=1.12, which is significant at 0.01 level).
9) There exists significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on their educational qualification. This findings is supported by the following result (F value=18.98, which is significant at 0.01 level).
10) There exists no significant difference in the mean scores of perception of prospective teachers towards the utility of ICT in teaching-learning process based on their family monthly income. This findings is supported by the following result (F value=0.72, which is not significant at any level).

CONCLUSIONS

The following conclusions were drawn from the present study.

1) The majority of the prospective teachers have medium level of perception towards the utility of ICT.
2) The utility of ICT is influenced by the background variables, Age, Religion and Type of management, Optional subjects, and Educational qualification.

3) The teacher aspirants are the future nation builders. Hence the investigator concludes the need for developing more favourable perception towards ICT integration in teaching.
4) Gender, Locality, Computer Knowledge, Monthly income have no influence on the utility of ICT by prospective teachers.
5) To develop a more favourable perception towards ICT integration, pre-service training to develop computer knowledge, skills and provision of accessibility to resources is of vital importance.

EUCATIONAL IMPLICATIONS OF THE STUDY

1) The present investigation has helped to develop an instrument for measuring perception towards the utility of ICT in teaching-learning by prospective teachers.
2) Findings of the study indicate the need to develop positive perception towards the utility of ICT in teaching-learning by prospective teachers.
3) This study throws light on the responsibility of the authorities to take necessary steps to provide proper technologies in teaching-learning process.
4) Barriers for ICT integration like lack of ICT oriented pre-service training, lack of appropriate software and materials, lack of hardware should be taken care of in teacher education programme.

SUGGESTIONS FOR FURTHER RESEARCH

The present study is meaningful and effective, similar studies should be conducted in this area. The desirable areas of using further research are the following,

1) The present study has only seven dimensions, more dimensions can be included in further studies.
2) The present study is only used for finding the perception of prospective teachers. The further studies can be conducted to find the effectiveness of ICT teaching-learning process.
3) This study includes the subject's arts, science and commerce subjects. The further studies can be conducted on other courses.

The findings and implications of this study, help to understand the perception towards the utility of ICT by prospective teachers in teaching-learning of various colleges. Even though there are many limitations in the present investigation, the study helps the Educationalists, Psychologists, Sociologists and all members of the fields to understand the current situation of our Professional Education system and can help for further investigation and take necessary steps to improve our education system.

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APPENDICES

APPENDIX A

N.V.K.S.D COLLEGE OF EDUCATION

ATTOOR KANYAKUMARI DISTRICT

2013-2014

INSTRUCTION:

Certain personal data regarding you are required for my research purpose. The information given by you will keep confidential and will be used for the research purpose only. Write your Name, Institution and put tick (√) to each statement.

PERSONAL DATA SHEET

Name of the student :

Name of the Institution :

Age : Below 20/Below 30/Above 30

Gender : Male/Female

Locality : Rural/Urban

Religion : Hindu /Christian/Muslim

Type of Management : Aided/Unaided

Optional Subject :

Computer knowledge : Yes/No

Educational Qualification : HSS/UG/PG

Family monthly income :

APPENDIX B

N.V.K.S.D COLLEGE OF EDUCATION

ATTOOR KANYAKUMARI DISTRICT

ICT PERCEPTION SCALE

(Draft Scale)

Prepared by

(JIMI.I.B & Mrs. BINDU GOURI .V.P)

2013-2014

INSTRUCTION:

The following statements are related to the Perception of Prospective Teachers towards the utility of ICT in Teaching-Learning. Kindly read all the statements and respond by put a tick mark (√). Please do not omit any statement.

Strongly Agree (SA)/ Agree (A)/Undecided (UD)/Disagree (D)/Strongly Disagree(SD)

Sl. No	STATEMENT	SA	A	UD	D	SD
	ICT access for teaching					
1	ICT can be easily accessed by teachers and students.					
2	Teachers may hesitate to use computers/or internet in front of the students during teaching.					
3	To develop the student's computer knowledge, the school can provide separate laptop to the students.					
4	Teleconference method of teaching is not so effective.					
5	With the help of power point presentation, the teacher can make the classroom teaching interest.					
6	Over use of models may distract the attention of students.					

7	ICT accessed teaching can’t be used for visually challenged students.					
8	EDUSAT promotes a shift from passive learning to active learning.					
ICT based resources used for teaching						
9	ICT can be used to get feedback and to assess students learning.					
10	Digital learning resources need not to be validated before teaching.					
11	Internet can be used to collect learning materials for teaching.					
12	Digital learning materials for students can be created through ICT.					
13	ETV will distract students and affects classroom discipline.					
14	With the help of ICT, self instructional techniques can be developed.					
15	Unwillingness to use the available resources is the main barrier in ICT equipped schools.					
16	The internet can connect students with information resources that were unavailable to students in the past.					
Knowledge Creation						
17	ICT based learning resources and environments create knowledge communities.					
18	Teaching through ICT does not support continuous and reflective learning.					
19	Use of ICT supports the development of critical thinking skills in students.					
20	Preparation of project reports with the help of Ms-word and Ms-power point does not enhance teaching and learning.					

21	The main aim of ICT integration is to supplement teaching.					
22	Lack of teacher's support in doing exercises and practice through ICT will make them inactive.					
23	Effective ICT integration depends on the attitude of college authority.					
24	Through E-learning, prospective teacher can develop their teaching – learning skills.					
Learning through ICT						
25	Web-based learning helps the teacher to go deeper into the subject and investigate new areas.					
26	ICT enabled teaching, enhance student's motivation to learn.					
27	The teacher can learn by exploring more opportunities through various exposures of ICT.					
28	ICT equipped environment may affect self-motivation.					
29	ICT use in teaching and learning positively impacts remedial learning.					
30	Computer assisted instruction will affect the self-confidence of the students.					
31	ICT does not help the students to work in a collaborative way					
32	Lack of ICT literacy among students makes its integration unsuccessful.					
Skills of ICT						
33	The use of electronic devices like tape recorder, TV, DVD, VCR, LCD, computer etc. can make language learning visually appealing.					
34	ICT integration demands continuous training and support to prospective teachers.					

35	Students find difficulty in handling digital library.					
36	EDUSAT integration demands administrative support.					
37	Lack of confidence is the main difficulty faced by prospective teachers in using ICT devices.					
38	Preparation of power point presentation is time consuming.					
39	Use of EDUSAT, TV, CAI and radio are expensive and many schools can't just afford them.					
40	Many prospective teachers find it difficult to integrate technology with the content.					
Computer and Internet in Teaching and Learning						
41	Collecting information through computers and the internet help the teacher to develop their subject knowledge.					
42	Learning through computers and the internet may deviate learning from the curriculum.					
43	Use of internet and computer may affect the behaviour of the student in a negative way.					
44	Computer enables the teacher to manage classroom data.					
45	Data stored in computers are temporary, because it may be corrupted by virus.					
46	Free access and exploration of modern ICT devices should be allowed in Teacher education institution.					
47	Computer based learning help to make effective evaluation of learner performance.					
48	Use of computers help to prepare and maintain records of learner's progress efficiently.					

Application of ICT						
49	Using ICT, in communication may affect face to face communication.					
50	ICT helps prospective teachers to update information quickly and easily.					
51	ICT may not help pupil to stay motivated throughout the learning process.					
52	ICT devices like OHP, LCD and power point can enhance the quality of presentation.					
53	ICT helps prospective teacher to collect, store and retrieve information easily.					
54	While using ICT, the teacher cannot give maximum individual attention to the learners.					
55	Communication technologies help to develop fluency and accuracy in non-active learners.					
56	ICT approach will make teachers bi-literate i.e., able to communicate and handle information.					

APPENDIX C

N.V.K.S.D COLLEGE OF EDUCATION

ATTOOR KANYAKUMARI DISTRICT

ICT PERCEPTION SCALE

(Final Scale)

Prepared by

(JIMI.I.B & Mrs. BINDU GOURI .V.P)

2013-2014

INSTRUCTION:

The following statements are related to the Perception of Prospective Teachers towards the utility of ICT in Teaching-Learning. Kindly read all the statements and respond by put a tick mark (√). Please do not omit any statement.

Strongly Agree (SA)/ Agree (A)/Undecided (UD)/Disagree (D)/Strongly Disagree(SD)

Sl. No	STATEMENT	SA	A	UD	D	SD
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1	To develop the student's computer knowledge, the school can provide separate laptop to the students.					
2	Teleconference method of teaching is not so effective.					
3	With the help of power point presentation, the teacher can make the classroom teaching interest.					
4	Over use of models may distract the attention of students.					
5	ICT accessed teaching can't be used for visually challenged students.					
6	EDUSAT promotes a shift from passive learning to active learning.					

ICT based resources used for teaching						
7	Internet can be used to collect learning materials for teaching.					
8	Digital learning materials for students can be created through ICT.					
9	ETV will distract students and affects classroom discipline.					
10	With the help of ICT, self instructional techniques can be developed.					
11	Unwillingness to use the available resources is the main barrier in ICT equipped schools.					
12	The internet can connect students with information resources that were unavailable to students in the past.					
Knowledge Creation						
13	ICT based learning resources and environments create knowledge communities.					
14	Teaching through ICT does not support continuous and reflective learning.					
15	Use of ICT supports the development of critical thinking skills in students.					
16	Preparation of project reports with the help of Ms-word and Ms-power point does not enhance teaching and learning.					
17	The main aim of ICT integration is to supplement teaching.					
18	Effective ICT integration depends on the attitude of college authority.					
Learning through ICT						
19	Web-based learning helps the teacher to go deeper into the subject and investigate new areas.					
20	ICT enabled teaching, enhance student's motivation to learn.					

21	The teacher can learn by exploring more opportunities through various exposures of ICT.					
22	ICT equipped environment may affect self-motivation.					
23	ICT does not help the students to work in a collaborative way					
24	Lack of ICT literacy among students makes its integration unsuccessful.					
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33	Computer enables the teacher to manage classroom data.					
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35	Computer based learning help to make effective evaluation of learner performance.					
36	Use of computers help to prepare and maintain records of learner's progress efficiently.					
Application of ICT						
37	Using ICT, in communication may affect face to face communication.					
38	ICT helps prospective teachers to update information quickly and easily.					
39	ICT may not help pupil to stay motivated throughout the learning process.					
40	ICT helps prospective teacher to collect, store and retrieve information easily.					
41	While using ICT, the teacher cannot give maximum individual attention to the learners.					
42	ICT approach will make teachers bi-literate i.e., able to communicate and handle information.					