‘e – READINESS’ AMONG PRIMARY TEACHERS TO INTEGRATE ICT IN TEACHING LEARNING PROCESS

RESEARCH PROJECT

Submitted to

THE DIRECTOR

STATE COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING

CHENNAI - 600 006

RESEARCHER

RUBYSELVARANI V

DISTRICT INSTITUTE OF EDUCATION AND TRAINING

MUNANJIPATTI, TIRUNELVELI DISTRICT-627355

2023 – 2024

DISTRICT INSTITUTE OF EDUCATION AND TRAINING

MUNANJIPATTI, TIRUNELVELI DISTRICT

CERTIFICATE

This is to certify that the research project entitled, **"***e* – READINESS' AMONG PRIMARY TEACHERS TO INTEGRATE ICT IN TEACHING LEARNING PROCESS**"** submitted by Rubyselvarani. V**,** Lecturer, DIET, Munanjipatti is a record of bonafide research work done by her and it has not been submitted for the award of any degree, diploma, associateship, fellowship of any University / Institution.

Signature of the Principal,

District Institute of Education and Training

Munanjipatti

Tirunelveli - District

Place: Munanjipatti

Date:

RUBYSELVARANI. V

Lecturer

District Institute of Education and Training

Munanjipatti

Tirunelveli - District

DECLARATION

I **Rubyselvarani. V** hereby declare that the report entitled "*e* – READINESS' AMONG PRIMARY TEACHERS TO INTEGRATE ICT IN TEACHING AND LEARNING PROCESS" submitted to the State Council of Educational Research and Training, Chennai as the project is a record of original and independent research work done by me during **2023 – 24.**

Place: Munanjipatti Signature of the Researcher

Date : (**RUBYSELVARANI. V)**

ACKNOWLEDGEMENT

First and foremost the investigator praises **GOD ALMIGHTY** without **His** grace nothing would have been possible.

I take this opportunity to express my sincere, heartfelt gratitude and thanks to **The Director, State Council of Educational Research and Training, Chennai – 6** for granting permission and providing the opportunity to complete this project work. I am most grateful to ***Dr. S. Shameem***, Deputy Director, SCERT, Chennai – 6 for her ideas and thought provoking suggestions to take and complete this project work.

I convey my sincere thanks to Research Project Committee members from university and Education colleges namely *A. Veliappan, Ph.D.,* Assistant Professor (Stage – III), Department of Education, Manonmaniam Sundaranar, University, Tirunelveli – 627 012, *Dr. Yuvaraj T,* Assistant Professor, Department of Psychology, Manonmaniam Sundaranar, University, Tirunelveli, *Dr .A. Micheal J Leo,* Assistant Professor, St.Xavier's College of Education Autonomous, Palayamkottai, Tirunelveli for validation of tool.

I convey my sincere thanks to Research Project Approval Committee members from schools like that *S. Prabu Ranjith Edison*, PG Assistant, GHSS, Maruthakulam, *M. Kamalam*, B.T. Asst., GHSS, Suthamalli and *M.T. Requlin Latha,* Sec. Grade Teacher, PUMS, South Pathini Parai

I would like to show my greatest gratitude to ***Dr P.Golda Grena Rajathi***, Principal, District Institute of Education and Training, Munanjipatti, Tirunelveli District for his valuable supervision, advice and granting permission whenever required to complete this project work in time.

I would like to express my heartiest, deepest, sincere and special gratitude to ***Dr B. William Dharma Raja***, Dean, Department of Education, Manonmaniam Sundaranar University,Tirunelvel - 627 012 for the valuable guidance and continuous support.

I express by heartiest thanks to ***Dr A.Anto Boopalarayan***, Principal, District Institute of Education and Training, Vanaramutti, Thoothukudi District for her valuable support and help in the process of my project. The support received from her was vital for the successful completion of this project.

I extend my sincere thanks to ***Dr.A. Vences Cyril,*** *Principal, M.V.M. Chellamuthu Alagurathinam College of Education, Dindigul*, for his sincere support in data analysis and project work.

I express my heartiest thanks to *Dr. R. Indra Mary Ezhilselvi*, Assistant Professor of Psychology, St.Ignatius College of Education, Palayamkottai, Tirunelveli, for validation of tool and handling counseling sessions to the students.

I would also like to thank ***Dr. M.T. Manjula Devi***, Senior Lecturer, District Institute of Education and Training, Munanjipatti, for her timely help in data analysis in SPSS package.

I extend my sincere thanks to ***Mr.G.Muthiah ,*** Chief Education Officer, Tirunelveli, for his sincere support to do this project.

Above all, I owe my gratitude to my beloved ***Husband, my kids and my mom*** for their dedication and constant and continuous encouragement for the successful completion of this research project. Finally, I am indebted to all those who supported me in every little way for the completion of the project work.

Rubyselvarani. V

CONTENTS

LIST OF TABLES

CHAPTER-I

INTRODUCTION

1.1 INTRODUCTION

"Education is the manifestation of the divine perfection, already existing in man."

-Vivekananda

The universe is the creation of God. Right from the origin of our civilization, man is in search of understanding the creation, because among the living and non-living organisms only man has got the power of thinking. Without the faculty of thinking, man is to an animal. So, for this thinking education is must. Only through education man's knowledge will be developed. The term education has been variously defined by various thinkers. While the Indian thinkers have taken a spiritual view of the concept of education, the western thinkers have taken the pragmatic view.

According to John Dewey, (1986) "Education is the development of all those capacities in the individual which will enable him to control his environment and fulfill his possibilities" Knowledge as the center of education, the very term 'Veda' means 'Knowledge'. The second view of education is derived from Latin word 'educare' meaning to educate, to bring up, to raise, to nourish. This means, bringing up the child according to certain ends or aims. "Educere" is also a Latin word and it means to lead out or to draw out.

Education means the modification of behaviour of the child. In other words, modification of behaviour should take place in the direction of social values or conditions. One of the aims of education is to develop a nation as a social welfare state, where there is not much gap between the rich and the poor and that every man's basic needs are satisfied. Education is a process of development; with industrial and scientific advancement the vocational aspect of education became an important aim of education.

According to Secondary Education Commission (1965), knowledge gained is useless if an individual is not able to secure a job. Kothari Commission (1964-66) has suggested that education must increase productivity. For that it suggested science education and work experience. Modern societies are distinct from traditional societies, for their use of science-based technology. In order to enhance this distinctive merit, Science education must become an integral part of school education.

According to the commission work experience implies participation in productive work in school, in the home, in workshop, on a farm, in a factory or in any other professional institution. In the program of relating education, to life and productivity, work experience must be introduced as an integral part of all education general and vocational. The Kothari Commission also suggested education for modernization. The present century made a great advancement in scientific and technical knowledge as a result of industrial revolution.

1.2 EDUCATONAL TECHNOLOGY

Educational technology can be regarded, as the application of systematic knowledge about learning and instruction to teaching and training with the aim of improving their quality and efficiency. For this reason, a wide range of presentation, control and feedback devices may be employed such as teaching machines, stimulators and computers. It should, however, be emphasized that techniques such as critical path analysis, curriculum development methods and task analysis are essential components as well as the hardware system. In fact, as long as programmed learning co-ordinates these techniques, it is woven into the fabric of educational technology.

Educational technology is a complex integrated process involving people, procedures, ideas, devices and organization for analyzing problems and devising, implementing, evaluating and managing solutions to those problems involved in all aspects of learning.

Educational technology can be regarded, as the application of systematic knowledge about learning and instruction to teaching and training with the aim of improving their quality and efficiency. For this reason, a wide range of presentation, control and feedback devices may be employed such as teaching machines, stimulators and computers. It should, however, be emphasized that techniques such as critical path analysis, curriculum development methods and task analysis are essential components as well as the hardware system. In fact, as long as programmed learning co-ordinates these techniques, it is woven into the fabric of educational technology.

Normally in the growth of technology applications in education, we are moving towards a virtual reality, the distance between the teacher and the taught will he nil. The possibility of such virtual reality can be made by generating good multimedia and accessible by all. Multimedia are basically a package that satisfies the conditions like i.e. minimization of the distance, cost effectiveness, user-friendliness and adaptability to local conditions.

1.2.1 Meaning of Educational Technology

Educational technology has been described in a number of ways. In the present context it refers to a planned and structured manner of conducting instructional activities. The main focus of educational technology is on a purposeful planning of instruction.

1.2.2 Definition of Educational Technology

"Educational technology as the means of development, application and evaluation of three different things. Techniques, system, and Aids to improve the process of human learning" - National council of Educational Research and Training (2004)

"Educational technology is the systematic application of scientific about teaching learning and conditions of learning to improve the efficiency of teaching and learning.

1.3 NATURE OF EDUCATIONAL TECHNOLOGY

The movement towards educational technology began to develop after world war-II. Initially the term meant using audio visual communication media. However the field of educational technology to focus on the development of teaching learning procedures borrowed from the behavioral psychology. Today, the field also includes corporate cognitive psychology, psychometrics, perception psychology, and management.

The basis of educational technology, the science and technical advancement was started. Educational technology studies the effect of science and technology upon education. In other words, science and technology are used under educational technology. Hence, it was the practical aspect of science.

Educational technology is a continuous dynamic, progressive and effect-producing method. Educational technology cannot solve each and every problem of education. It can be used successfully in teaching and instructional system only.

Audio-visual aids cannot be termed as educational technology. It is because its concerned only with the process-aspect of educational technology and not with the input and output aspects. But if these used to achieve educational objectives, then it can be put in the category of educational technology.

Programmed instruction is also different from educational technology. Its main cause is that the student learns himself during the programmed instructions. It does not allow interaction between pupil and teacher. Hence, it can be used only for limited objectives and limited subject-matter. Therefore, programmed instruction is merely a part of educational technology.

Educational technology accepts schools as a system. In this system teacher act as input while various methods, techniques, strategies and the teaching and examination with the help of audio-visual aids function in the form of a process. Lastly, the output is in of form of ability of the pupils.

Engineering technology is not the educational technology because the engineering technology has manufactured radio, tape-recorder, multimedia-tape, and T.V., etc. that are used in teaching as audio-visual aids, but still engineering technology differs from educational technology. In education, it is accepted as hardware approach only.

1.4 OBJECTIVES OF EDUCATIONAL TECHNOLOGY

The Educational technology at macro level or broad level is as under: To identify education needs of the community. To achieve the aims of education, to develop a suitable curriculum, to determine appropriate strategies, to suggest remedies to overcome the above traced out obstacles, to manage the whole system of education, to identify the resources-human and non-human and to locate the major obstacles in the way of proper development of learners

The objectives of Educational technology at micro level i.e., in view of specific class room teaching are as under to identify the educational needs of the pupils, to determine the classroom objectives of behavioral terms, to analyze the contents of instructions and organize them, to evaluate class room teaching in terms of students performance, to plan the teaching strategies ,to identify the resources-human and non-human and to provide feedback to the teacher and the students for betterment of teaching-learning process.

Regarding objectives of Educational technology, Hilliard Johnson has given the following objectives. Transmission of information, Serving as role model, Contribution to the provision of feedback and assisting the practice of specific skills.

1.5 CHARACTERISTICS OF EDUCATIONAL TECHNOLOGY

Educational technology was based on scientific and technological development. Educational technology is a practical rather than a theoretical discipline. Educational technology making use of research finding in the fields of psychology, sociology, engineering, information technology, applied science with sum of the finding with many

field of education to make the teaching learning process very simple, systematic and effective. Educational technology locates the problems in education premeds them ultimately aims at improving the educational system. Educational technology must he sound to improve the teacher student and teaching learning process.

1.6 NEED OF EDUCATIONAL TECHNOLOGY

Student learning through involvement with challenging tasks. Professionalization of teachers and Creation of a culture that supports learning both in the class room and beyond it to redefining of the role of teachers and learners. The technology of education is advancing in such a speed that feel that days are not for off when would be able to depend more on educational technology develop software for educational process. The technology would help us to learn the art or skill of listing, skill of speaking, skill of calculating more speedily and accurately keeping the galloping increase in our knowledge in a day and the emerging demand of mankind. It is the fact that development of educational technology will enable as extensive automated education future will be depend on the integration of information technologies. The exploding world population. The exponential rate at which new knowledge is being generated. The changing science and technology of our current society. Problems of education like free primary education and eradication of adult illiteracy can never be solved through conventional teaching techniques. The deterioration of falling can checked and quality instruction can be imparted. If educational technology and programmed material are used instead of conventional classroom teaching. The much difficult task of teaching foreign or other regional languages can be quickly accomplished if educational technology was utilized in the service of languages teaching.

There are millions and millions of learners those cannot afford to join schools &colleges for continuing their formal education, through educational technology; we can give them the best possible instruction while they stay at home. (Haseen Taj, 2006).

1.7 TECHNOLOGY IN EDUCATION

It's sustainable application like audio, multimedia equipments or any other kind of instrument that is to be used to increase the effectiveness of teaching learning process. The technology in educational process is a hardware or hardware approach.

The application of technology in education for instructional purposes is technology in education. Technology in education is concerned with tools, language laboratory, various projected media and computer. By using the appropriated hardware along with suitable software, we can make the teaching-learning process more effective and efficient. When the term was first coined it was referred to technology in education, implying the use of a variety of audio-visual aids for teaching purposes. Implicitly relying on the then widely accepted sender–receiver construct, educational writers saw these aids primarily as transmitters of lesson, content.

1.8 TECHNOLOGY OF EDUCATION

Educational technology refers to the techniques and methodologies of teaching learning process, technology of education consider as a software approach in education, it means course ware usage of educational technology in education. The result in increased effectiveness of education process, that includes increased understanding of subject matter among the students.

Technology of education involves the systematic applications of educational principles in the process of education. The discovery of general scientific knowledge about learning specific learning devices, techniques and methods play a significant role in improving the efficiency of the learning and teaching process.

Technology of education refers mainly to instructional strategies in achieving the educational objectives. Applying stems approach to solve educational problems, adopting process of human learning base on psychological researches concerning learning, groups and individual differences and mobilizing multi-sensory approach for effective communication are some of the strategies that are planned under technology of education.

1.9 RELATIONS OF TECHNOLOGY WITH EDUCATION

The relationship of education technology with the system of education explained three dimensions such as, General administration, Testing and Instruction

The uses of technical management systems, modern equipment, etc., represent the fairly obvious applications to the field of general administration. Probably it can easily be shown that this area of management was, taken as a whole, two or three decades begin its counterpart in industry, the problems associated with technology and school management are not as difficult as some of the others and will not, at this time, be considered. This is not to say that administration is not highly interrelated with the other two areas of testing and instruction, but the position can be taken that the problems arising from the latter two should guide the technical solutions in administration, not the other way around.

1.10 INSTRUCTIONAL TECHNOLOGY

In instructional technology, the presentation of the contents is described in or out of the class. The pupils are motivated for learning in both, instruction and teaching but still there is much difference between these two. Instruction means communication of information. Other persons and methods than a teacher can do this. For example, various types of audio-visuals aids can guide the students. The correspondence course and Open University may accomplish the task of instructions successfully through press and television actually instructional Technology is based upon hardware approach. It includes teaching material prepared on the basis of machines like tape-recorder, record player, television and projector etc. with the help of this, large groups of the students may be provided with the knowledge in minimum time and expenses.

Instruction is helpful in making teaching easy, precise, interesting and effective, but instructional technology cannot replace a teacher because the teacher can perform the teaching job only.

Interaction between teacher and pupils is a must in teaching while in instructions, especially in programmed instructions, the pupils can learn himself. Instruction is used in teaching and hence teaching can be named as instruction but instruction cannot be termed as teaching because interaction between a teacher and pupils is not essential in instructions. Instruction can develop cognitive domain of the pupils only, while effective and cognitive domains may also develop by teaching. Thus, the basis of instructional technology is the machine system. It provides assistance in teaching work through machines prepared with the help of science and technology. In the words of instructional technology is a systematic way of designing, carrying out and evaluating the total process of learning and teaching in terms of specific objectives, based on research, on human learning and communication and employing a combination of human and non-human resources to bring about more effective instruction.

Thus, the instructional technology motivates learning process. The instructional material is selected keeping in view the objectives. Simultaneous various methods, techniques, strategies and audio-visual aids are used for presenting the lesson so that the objectives may be achieved in the end, the achievement of the objective is evaluated if the objective is not achieved owing to any reason, than again the decision regarding any proposed change is taken so that the desired change is taken so that the desired change in the pupils behavior may be brought about.

1.11 INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN EDUCATION

The quality of Education depends to a great extent on the quality of teachers. It is the known fact that quality teachers opt for an innovation in their teaching aspect through integrating technology in the Classroom Instruction to give the best to student-teachers. Since Technology is a powerful tool for problem-solving, conceptual development and critical thinking help to make the learning process much easier for the student-teachers. To be effective in the classroom Instruction, Teacher-educators should acquire the knowledge and skills to use the new challenges in promoting innovative teaching strategies that are student-centered collaborative, engaging, authentic, self-directed and based on the development of higher order thinking skills with respect to handling classes for student-teachers which aims to achieve high academic standards.

Globally, educational systems are under great pressure to adopt innovative methodologies and to integrate New Information and Communication Technologies (NICTs) in the teaching and learning process, to prepare students with the knowledge and skills they need in the 21st century. Apparently, teaching profession is evolving from an emphasis on teacher-centered, lecture- based instructions to student-centered interactive learning environments.

ICT can be used as a tool in the process of education in the following ways.

Informative tool: It provides vast amount of data in various formats such as Audio, Multimedia, documents.

Situation tool: It creates situations, which the student experiences in real life. Thus, simulation and cvirtual reality is possible.

Constructive tool: To manipulate the data and generate analysis.

Communicative tool: It can be used to remove communication barriers such as that of space and time.

Use of ICT in education develops higher order skills such as collaborating across time and place and solving complex real world problems. It improves the perception and understanding of the world of the student. Thus, ICT can be used to prepare the workforce for the information society and the new global economy. Institutions must promote 'learning to learn', i.e., the acquisition of knowledge and skills that make possible continuous learning over the life time. 'The illiterate of the 21st century', according to futurist Alvin Toffler, 'will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn'.

Henceforth, the training is imparted on knowledge and utilization of Information and Communication Technology (ICT), which has the potential to adopt to the student's instructional needs in the classroom situation. This new learning environment created by ICT is called Interactive Learning Environment. ICT integration in institutions is being perceived as a necessity and is growing exponentially. The pervasive use of technology in all spheres of life, the knowledge economy and the paradigm shift together, generate demands on the institutions to adopt ways that help inculcate 21st century skills amongst students.

1.12 INFORMATION COMMUNICATION TECHNOLOGY TOOLS

The following are some of the ICTs tools that can be used effectively in the Classroom Instruction like e-Learning, m-Learning, Computer Assisted Instruction (CAI), Virtual Learning Environment (VLE), On-line Learning, Blogs, Podcasting, Multimediaconferencing, etc.

(i) e-Learning

e-Learning which refers to the electronic learning promotes innovative strategy in teaching methods with information of diversified learning environment. It has more variety of information resources in learning experience with the use of Multimedia and non-verbal presentation by teaching material that encourages more and more self-learners

to continue life-long learning without limitation of space, time and profession. It is a single point of access that serves as a gateway to variety of e-resources.

(ii) m-Learning

Mobile Learning is termed as m-Learning which is enabled by the use of portable computing devices such as PDA's, Palmtops, Smart Phones, and Tablet PC's communicating over wireless networks. The use of computing in teaching and learning is being extended to spaces beyond the traditional classroom and within the classroom; the teachers and learners are gaining more flexibility. It provides new opportunities for interaction with each other through Short Messaging Service (SMS), downloading the course-content where lessons are provided in bit-sized format, a fact that is appealing to busy students through Blue-tooth connectivity easily without Internet connectivity.

(iii) Multimedia Assisted Instruction (MM)

It is a development of systematic programmed learning and teaching method. It is a self-instructional device with the principle of automization. MM is "Multimedia applications applied to traditional teaching methods such as drill, tutorial, demonstration, simulation and instructional games". It is an effective medium and an indispensable aid in the teaching-learning process. It is perhaps the best in classroom instruction, because it offers such as Individualized Instruction, Effective interaction with the Learner and immediate feedback. Engage students as active learners and Promote student self-assessment and self-reflection

Thus, there are so many advantages for an individual to enrich his learning to the great extent as one likes. The learner may feel that a best teacher is with him whenever one learns through Computer Assisted Instruction.

(iv) Virtual Learning Environment (VLE)

VLE is a set of teaching and learning tools designed to enhance a students' learning experience by including computers and Internet in the learning process. The principal

components of VLE package include Curriculum Mapping, Student Tracking, On-line support for both Teachers and students.

1.13 BENEFITS OF ICT IN CLASSROOM INSTRUCTION

There are enormous benefits from the usage of Technology in Classroom Instruction. The benefits of this technological feature in Classroom Instruction are summarized below.

- Improves efficiency both in teaching and learning
- Increases motivation
- Paves way for Personality Development
- Active Participation of students
- Self-paced Learning
- Very flexible and rich medium for students to access the information
- Better learning, Retention and Students' performance
- Multisensory Learning experience

The enormous benefits of ICT have been well documented by various authorities and researchers such as Becta (2004), Akudolu (2002), Sharp and Potter (2002) and Olibie (2003). Thus, ICT has enormous potentiality to deliver many numbers of benefits to the learners. Unless we use ICT one cannot obtain up-to-date information to face the competitive world. Using Information Communication technology is the need of the hour and essential part of the life of every individual who wish to enrich one's life.

Teachers are encouraged to experiment and adopt a variety of innovative Learner-Centred, Pedagogical Teaching and Learning Approaches, in order to evolve alternatives to the traditional methods of Lecture. The effective and efficient use of technology depends on technically competent educators/teachers. They should be able to appreciate the potentiality of these technologies and have positive attitude. To implement Technology based learning in the Teacher Education Programme so as the student-teachers while they

become teachers in school would be able to utilize Technological tools in Classroom Instruction in promoting Flexible Learning Environment to meet individual learning objectives of the subject matter content. The Four phases are there to integrate ICT in classroom instruction as given below.

i. Developing Information and Communication Technology (ICT) literacy
ii. Effective and Efficient use of Hardware and Software for teaching learning activities
iii. Technology based environment, on-line support, networking and management and
iv. Adopt best innovative practices in the use of technological approach

Technology has great potential for knowledge dissemination, effective learning and efficient educative services yet. Of the educational policies are not well thought out and if the prerequisites condition for using the technology are not met concurrently, the potential will not be realized. If an Institution or individual follows the above phases to integrate ICT, definitely one can acquire the maximum benefits in learning. If a teacher integrates the technology in teaching, it will help the teacher to discharge the duty effectively. Training of teacher should be based on practical demonstrative on the uses of Information and Communication Technology in teaching and learning and the application of ICT in the classroom.

1.14 E-READINESS

E-readiness, in the context of primary teachers integrating Information and Communication Technology (ICT) in the teaching and learning process, refers to the preparedness and capability of educators to effectively use digital tools and resources in their classrooms. This concept encompasses several dimensions including access to necessary technology, teachers' skills and confidence in using ICT, the availability of supportive infrastructure, and the presence of a conducive policy environment. E-readiness

also involves the alignment of educational content and pedagogy with digital platforms to enhance learning outcomes. Teachers must not only possess technical proficiency but also pedagogical knowledge to integrate ICT in ways that actively engage students and foster a collaborative and interactive learning environment. Additionally, ongoing professional development and support are critical to maintaining and improving e-readiness, ensuring that teachers stay updated with emerging technologies and best practices in digital education.

1.14.1 E-Learning Readiness

Readiness for an organization intending to adopt E-learning can be defined as the "mental or physical preparedness for that organization for some E-learning experience or action" (Karmakar & Wahid, 2000).

"E-ready" society is one that has the necessary physical infrastructure (high bandwidth, reliability, and affordable prices); integrated current ICTs throughout businesses (ecommerce, local ICT sector), communities (local content, many organizations online, ICTs used in everyday life, ICTs taught in schools) and the Government (egovernment); strong telecommunications competition; independent regulation with a commitment to universal access; and no limits on trade or foreign investment (Harvard Center for International Development, 2002 as cited in Alghamdi, Goodwin & Rampersad, 2011).

E-learning Readiness is the mental or physical preparedness of an individual for some e-learning experience or action (Borotis & Poulymenakou, 2004).

According to **Bowles (2004)** E-learning Readiness can be defined as the assessment of how ready an institution is to adopt and implement E-learning.

E-learning Readiness is regarded as a kind of skill **(Lopes, 2007)** or ability (Kaur & Abas, 2004) for increasing the quality of learning and for taking advantage of the benefits of E-learning.

Machado (2007) explained E-readiness in context of higher education as "the ability of Higher Education Institutes and the capacity of institutional stakeholders to generate learning opportunities by facilitating computer-based technologies".

E-learning Readiness is the level of mental & physical preparedness of an organization in terms of technological skills, online learning style, equipment/ infrastructure, attitude, human resources, financial etc (Mutiaradevi, 2009).

Inan and Lowther (2010) defined E-learning Readiness of teachers" as teachers" perceptions of their capabilities and skills required to integrate technology into their classroom instruction, and teachers" readiness to integrate technology which is the most important factor that has a direct impact on technology integration.

1.14.2 Components of E-learning Readiness

Rosenberg (2000) focused on the concept of sustainability and proposed the components of business readiness, changing nature of learning and e-learning, value of instruction and information, role of change management, reinvention of training organizations to support e-learning efforts, e-learning industry and personal commitment.

Chapnick (2000) posed the components of psychological, sociological, environmental, human resource, financial, technology equipment and content readiness.

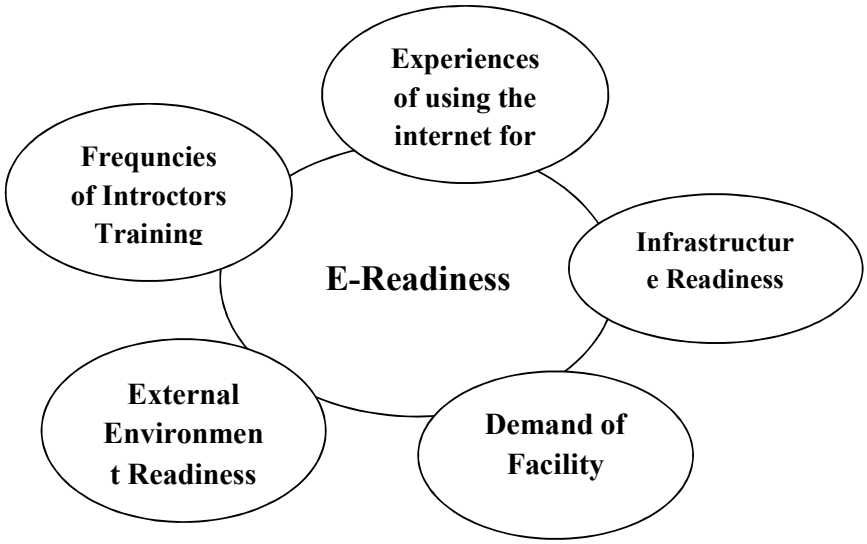
Government, Industry, Education and Society are identified as the key components in the first level of e-learning readiness. In the second level, the readiness is estimated based on the connectivity, the capability - a country"s ability to deliver and consume elearning, literacy rates, and trends in training and education – content and culture **(Borotis & Poulymenkou, 2004).**

Suwarsono (2015) revealed that there are three components that affect E-learning Readiness, i.e. self-directed learning, technical readiness and student preferences towards the form of material delivery that is different from face to face method.

Muharina and Kelana (2017) explained in a study the four components of E-learning Readiness as technology, innovation, people and self-development.

Khilani and Awad (2017) described the infrastructure readiness, frequencies of teacher training, experiences of using the Internet for education, external environment readiness and demand of facility as components of E-learning Readiness (Figure-1.1).

Figure-1.1: Components of E-learning Readiness (Khilani & Awad, 2017)



Source: https://iiste.org/Journals/index.php/IKM/article/viewFile/39835/40959.

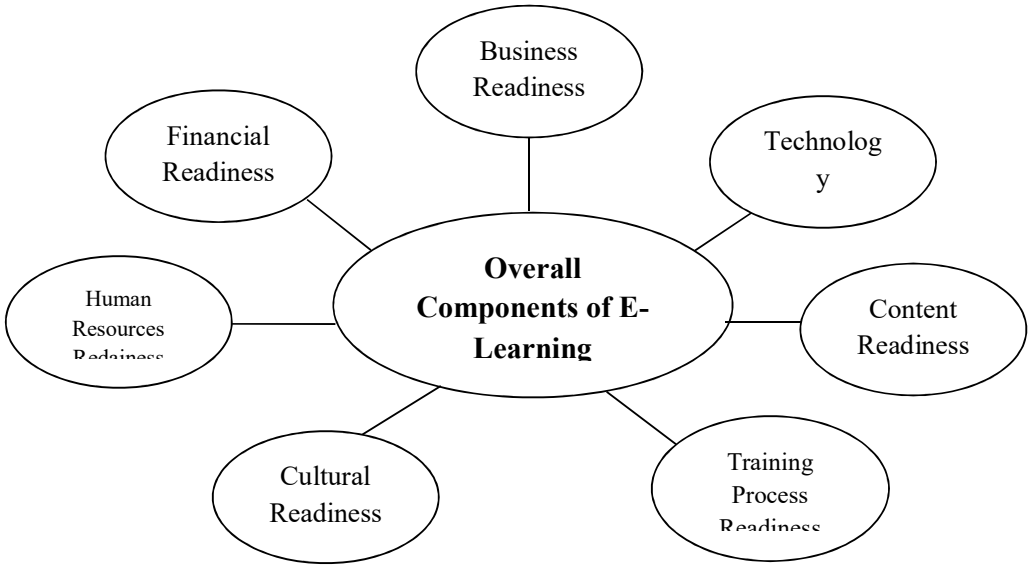
The overall E-learning Readiness is defined by seven key components:

- Business Readiness refers to the link of organizational business priorities and characteristics to e-learning efforts. Organizations operate in a highly competitive

environment where strategy, environment and smoothness of internal problems affect primarily their viability and profitability.

- Technology Readiness focuses primarily on the technical infrastructure.
- Content Readiness studies issues concerning E-learning content material such as interactivity, reusability, etc.
- Training Process Readiness refers to the ability of organizations to organize, analyze, design, develop, implement and evaluate a concrete training program.
- Culture Readiness determines organizations‟ perceptions and cultural parameters concerning e-learning adoption and use.
- Human Resources Readiness refers to the availability and set-up of the humansupport system. In this component some parameters such as receptivity and the prerequisites of humans to learn successfully in the new environment are defined.
- Financial Readiness refers to the budget allocation and investment for establishing a robust e-learning setup (Borotis & Poulymenkou, 2004).

1.14.3 Overall Components of E-Readiness



Indicators for E-learning Readiness

Indicators can be classified in the following main groups:

Network Access: What is the availability, cost and quality of ICT networks, services and equipment?

Networked Learning: Does the educational system integrate ICTs into its processes to improve learning? Are there technical training programs in the community that can train and prepare an ICT workforce?

Networked Society: To what extent are individuals using information and communication technologies at work and in their personal lives?

Networked Economy: How are businesses and governments using information and communication technologies interact with the public and with each other?

Network Policy: To what extent does the policy environment promote or hinder the growth of ICT adoption and use? (Budhiraja & Sachdeva, 2002)

1.14.4 Need of E-Readiness

Budhiraja and Sachdeva (2002) in their article on E-Readiness Assessment (India) highlighted the factors that promote the countries to be e-ready:

There are enormous advantages of ICT. It will not only lead to a Simple, Moral, Accountable, Responsive and Transparent (SMART) Government, it will also lead to making the citizens life easy. ICT promises various social and economical benefits as well. Secondly, the countries are facing a threat of being left behind.

Third, international leaders, foreign donors, and lending agencies are integrating ICT into development and aid programs. ICT is a key weapon in the war against world poverty. When used properly, it offers a tremendous potential to empower people in developing countries to overcome development obstacles; to address most communities, democratic institutions, a free press, and local economies.

E-readiness, in the context of primary teachers integrating Information and Communication Technology (ICT) in the teaching and learning process, is a multifaceted concept that involves several critical elements:

1. **Technological Access**: This involves ensuring that both teachers and students have reliable access to necessary technological tools, such as computers, tablets, internet connectivity, and educational software. Without these foundational resources, effective ICT integration is impossible.
2. **Digital Literacy and Skills**: Teachers need to be proficient in using various digital tools and platforms. This includes basic computer skills, familiarity with educational software, and the ability to troubleshoot common technical issues. Beyond this, teachers should be adept at using ICT to create, modify, and manage digital content.
3. **Pedagogical Integration**: Effective ICT integration requires teachers to align their teaching methods with digital tools. This involves understanding how to incorporate technology into lesson plans to enhance learning objectives, foster student engagement, and support diverse E-Readiness. It also means using ICT to promote critical thinking, creativity, and collaboration among students.
4. **Supportive Infrastructure**: Schools must have a robust infrastructure to support the use of ICT. This includes not only physical resources like high-speed internet and up-to-date hardware but also technical support staff to assist with maintenance and troubleshooting.
5. **Professional Development**: Continuous professional development is essential for teachers to stay current with the latest technological advancements and pedagogical strategies. Training programs, workshops, and collaborative learning communities can help teachers build their ICT competencies and share best practices.
6. **Institutional Support and Policy**: Schools and educational authorities need to provide strong leadership and clear policies that encourage and facilitate ICT

integration. This includes setting strategic goals, allocating appropriate funding, and creating a culture that values innovation and digital learning.

7. **Curriculum Alignment**: The curriculum should be designed to incorporate ICT in meaningful ways. This involves developing digital literacy as a core competency and integrating technology across different subjects to enhance learning outcomes.
8. **Student Preparedness**: Students also need to be prepared to engage with ICT in their learning. This includes developing their digital literacy skills and ensuring they have equitable access to technology both at school and at home.
9. **Evaluation and Feedback**: Regular assessment and feedback mechanisms are important to evaluate the effectiveness of ICT integration. This helps in identifying areas for improvement, understanding the impact on student learning, and ensuring that technological tools are being used effectively.
10. **Community and Parental Involvement**: Engaging the wider school community, including parents, is important for supporting ICT initiatives. Parents should be informed and involved in their children's digital learning to reinforce and extend the benefits of ICT beyond the classroom.

By addressing these aspects, primary teachers can achieve a state of e-readiness that not only enhances their teaching capabilities but also enriches the learning experiences of their students.

1.14.5 Need of E-Readiness among Primary Teachers to Integrate ICT in Teaching and Learning Process

1. **Modernizing Education**: The rapid advancement of technology necessitates that education systems evolve to incorporate digital tools and resources. E-readiness ensures that primary teachers can effectively integrate these technologies, keeping education relevant and engaging for students in a digital age.

2. **Enhancing Student Engagement**: Technology can significantly enhance student engagement by making learning interactive and fun. E-ready teachers can use ICT to create dynamic and multimedia-rich lessons that capture students' interest and cater to various E-Readiness.
3. **Supporting Diverse Learners**: ICT tools can provide personalized learning experiences, supporting diverse learners, including those with special educational needs. E-ready teachers can use technology to differentiate instruction, offering customized content and pacing to meet individual student needs.
4. **Improving Learning Outcomes**: Research shows that the appropriate use of ICT can improve student learning outcomes. E-readiness ensures that teachers are equipped to use technology effectively to enhance students' understanding, retention, and application of knowledge.
5. **Preparing Students for the Future**: As society becomes increasingly digital, students need to develop digital literacy skills to succeed in future academic and professional environments. E-ready teachers play a crucial role in equipping students with these essential skills.
6. **Enabling Distance and Blended Learning**: The COVID-19 pandemic highlighted the importance of being prepared for remote and blended learning. E-readiness ensures that teachers can smoothly transition between in-person and online teaching, maintaining the continuity and quality of education.

1.14.6 Significance of E-Readiness among Primary Teachers to Integrate ICT in Teaching and Learning Process

1. **Professional Development**: E-readiness fosters continuous professional growth for teachers. By staying updated with the latest technological trends and pedagogical practices, teachers can enhance their teaching effectiveness and job satisfaction.

2. **Educational Equity**: E-readiness promotes educational equity by ensuring all students have access to quality digital learning experiences. This is particularly significant for students in under-resourced areas who might otherwise be left behind in a technology-driven world.
3. **Innovative Teaching Practices**: E-ready teachers are more likely to experiment with innovative teaching practices, leading to a more dynamic and stimulating learning environment. This innovation can inspire students and encourage a lifelong love of learning.
4. **Collaboration and Communication**: ICT tools facilitate better communication and collaboration among teachers, students, and parents. E-readiness ensures that teachers can leverage these tools to build stronger learning communities and enhance parental involvement in education.
5. **Data-Driven Decision Making**: Technology enables the collection and analysis of educational data, helping teachers make informed decisions about instruction and student support. E-ready teachers can use data to identify learning gaps, track progress, and tailor their teaching strategies accordingly.
6. **Global Competitiveness**: Preparing students with digital skills makes them more competitive in the global job market. E-readiness ensures that teachers are contributing to the development of a workforce that is proficient in using technology and capable of thriving in a globalized economy.
7. **Sustainability**: Integrating ICT in education can support sustainability efforts by reducing the reliance on physical resources, such as paper, and promoting environmentally friendly practices. E-ready teachers can lead the way in implementing sustainable digital learning solutions.

In summary, e-readiness among primary teachers is crucial for modernizing education, enhancing student engagement, supporting diverse learners, and preparing students for a

digital future. It also holds significant benefits for professional development, educational equity, innovation in teaching, collaboration, data-driven decision-making, global competitiveness, and sustainability.

1.15 NEED AND SIGNIFICANCE OF THE STUDY

The need and significance of e-readiness among primary teachers to integrate ICT in the teaching and learning process are multifaceted and crucial in today's educational landscape. As technology advances rapidly, modernizing education to include digital tools is essential. E-readiness ensures that teachers can effectively integrate these technologies, making education relevant and engaging for students. Technology enhances student engagement by making learning interactive and fun, and e-ready teachers can create dynamic, multimedia-rich lessons that cater to various E-Readiness. Additionally, ICT tools provide personalized learning experiences, supporting diverse learners, including those with special educational needs. E-readiness also improves learning outcomes, as research shows that appropriate use of ICT enhances students' understanding, retention, and application of knowledge. Preparing students for a digital future is vital, and e-ready teachers equip them with essential digital literacy skills.

Moreover, e-readiness enables distance and blended learning, ensuring that education remains continuous and of high quality even during disruptions, such as the COVID-19 pandemic. It fosters professional development for teachers, allowing them to stay updated with technological trends and pedagogical practices, thus enhancing their teaching effectiveness and job satisfaction. E-readiness promotes educational equity by providing all students access to quality digital learning experiences, which is particularly significant for those in under-resourced areas. It encourages innovative teaching practices, leading to a more dynamic learning environment and inspiring a lifelong love of learning in students. ICT tools also facilitate better communication and collaboration among

teachers, students, and parents, and e-readiness ensures the effective use of these tools to build stronger learning communities.

Furthermore, technology enables data-driven decision-making, helping teachers tailor their strategies based on student progress and learning gaps. Preparing students with digital skills makes them more competitive in the global job market, and e-ready teachers contribute to developing a workforce proficient in using technology. Lastly, integrating ICT in education supports sustainability efforts by reducing reliance on physical resources and promoting environmentally friendly practices. Thus, the need and significance of e-readiness among primary teachers are paramount for modernizing education, enhancing student engagement, supporting diverse learners, and preparing students for a digital future while also promoting professional growth, equity, innovation, collaboration, data-driven decisions, global competitiveness and sustainability.

1.16 CONCLUSION

The growth of human capital depends upon the quality and the quantity of education. Due to the impact of the programmes undertaken for the ICT in teaching and learning process of primary school teachers, there is a rise in the demand of education at the primary level. *E*–readiness among primary teachers to integrate ICT in teaching and learning process is centrally sponsored scheme have been launched in the country for the development of primary education. In the 21st century scenario the education system has a tremendous change, the teacher should have update themselves in recent techniques and technologies. E-resources are very vital for the primary education. Thus, the need to study the integrate ICT in teaching and learning process has focused.

1.17 CHAPTERISATION

Chapter I

It deals with introduction, concept of education, educational technology, importance and need of educational technology, educatonal technology, nature of educational technology, objectives of educational technology, characteristics of educational technology, need of educational technology, importance of educational technology, technology in education, technology of education, relations of technology with eduation, scope of educational technology, forms of educational technology, instructional technology, information and communication technology (ICT) in education, information communication technology tools, benefits of ict in classroom instruction, e-readiness, conclusion need and significance of the study, conclusion and chapterisation.

Chapter II

It covers the studies relating synthesis of the reviewed studies about e-readiness, information and communication technology (ICT) and teaching learning process and synthesis of reviewed studies and research gap of the study.

Chapter III

This chapter includes introduction, statement of the problem, operational definitions of key terms, objectives of the study, hypotheses formulated, variables under the study, method used in the present study, survey method procedure, sample, tools used, delimitations of the study, tools used, limitations of the study and statistical techniques employed.

Chapter IV

It deals with Analysis of data which includes analysis of level of perception of teachers and students towards NMMS, level of attitude of teachers and students towards NMMS, significance difference in perception of teachers and students towards NMMS, attitude of teachers and students towards NMMS and relation between perception and attitude of teachers and students on NMMSS.

Chapter V

This chapter incorporates findings, interpretation, discussion, educational implications and suggestions for further research and conclusion.

The ensuing chapter deals with review of related studies. ●

CHAPTER-II

REVIEW OF LITERATURE

2.1 INTRODUCTION

The search for related literature is one of the first steps in the research process. It is a valuable guide to defining the problem, recognizing its significance, suggesting promising data gathering devices, appropriate study design and sources of data (Best and Kahn, 1999). 'A literature review is a description of the literature relevant to a particular field or topic. It gives an overview of what has been said, who the key writers are, what are the priming theories and hypotheses, what questions are being asked and what methods and methodologies are appropriate and useful. As such, it is not in itself primary research, but rather it reports on other findings' (Ilangovan, 1998). Capitalizing on the reviews of expert researchers can be fruitful in providing helpful ideas and suggestions.

2.2 PURPOSE OF REVIEW OF LITERATURE

Complete survey of related literature gives the researcher necessary insight into the problem that leads him to think about his approach for the study. Gives the scholar an understanding of the previous works done and widens the horizon of knowledge of the researcher Helps the investigator avoid the repetition of the past work and thus helps save time, energy and cost. It suggests appropriate methods to take the problem under study. It provides basis for formulating valuable hypotheses. It helps locate data that can be used in comparative interpretation of results and to avoid the replication.

2.3 SOURCES OF LITERATURE

The review of related literature can be identified and documented with the help of the materials such as follow, Bibliographies, Books, Journals, Research abstracts, Dissertation and thesis and research articles.

2.4 STUDIES CONDUCTED IN ABROAD

Review of Related Literature on E-learning Readiness of Teachers. **DeMontigny, Cloutier, Oullet, Courville and Rondeau (2001)** reported that an assessment of existing skills is important when planning a programme of professional development for ICT use in teaching. Apparently previous experiences, including successes and failures, can have an impact on an individual‟s willingness to try new technologies. The study aimed to identify nursing teachers‟ self efficacy and beliefs with regard to ICT used in an online Masters of Nursing programme in Quebec, Canada. The respondents felt that they had mastered all basic ICT skills, with the exception of anti-virus software and participation in group discussions. They felt that their self-efficacy in using library websites was limited, and also felt they could use only a limited number of advanced applications (for example webpage software). Respondents' motivation to learn new skills was unusually high, particularly when the introduction of new innovations for teaching and learning was generally regarded by educators elsewhere as a burden. They attributed their results to the likelihood that the nursing educators were a self-efficacious group and understood how important it was to use technology in the Masters programme. They concluded that teacher ICT self-efficacy, ICT skills and learning requirements should be pre-assessed so that appropriate training can be provided. They also suggest that follow up with regard to self-efficacy take place.

Kaur and Abas (2004) conducted a study on e-learning readiness among learners and tutors of Open University, Malaysia. Data was gathered with the use of the e-learning Readiness Research Tool, a questionnaire developed by a panel of experts representing 12 Malaysian educational and technology oriented institutions. The results of the analysis were found to be positive for e-learning readiness. It was found that only about a one- third of the sample perceived that learners were in an advanced state of elearning readiness. This was demonstrated by the fact that only 38% of receivers and 32% of enablers rated learners

7, 8, 9 or 10. Additionally, while many receivers and enablers perceived that learners were moderately ready (49% and 40% respectively) twice as many enablers (18%) than receivers (7%) rated learners as lacking in readiness for e-learning.

So and Swatman (2006) examined how ready Hong Kong‟s primary and secondary school teachers are to accept and adopt e-learning. They found that respondents were not yet fully prepared to use e- learning technologies – with differences in readiness perceived between male and female; and secondary and primary school teachers; as well as between teachers from different secondary schools.

Lopes (2007) carried out research to evaluate the e-learning readiness of a Higher Education Institution and report the results of its application in ESTSP, a Porto”s Allied Health Sciences Higher Education Institution. Documentation review, observation and two questionnaires were applied to collect data. The first questionnaire gathered information about students” skills, their access to equipment and perceptions on elearning. 273 students answered the questionnaire resulting in 7% response rate. Professors” questionnaire gathered information about ICT usage and skills, access t equipment and e-learning experience. 29 professors answered the questionnaire, almost this chapter deals with the review of related literature studies conducted in various researchers in abroad. In abroad there are studies in this research which was explained as follows; half (49%) of ESTSP‟s full time professors. It was found that student‟s access to computers and Internet, one of the major initial concerns, was not as low as initially expected. Yet, this doesn‟t attenuate the need to invest in infrastructures, which lack was identified by professors and students. Together with the financial dimension, this is an area where ESTSP has a low e-learning readiness.

Panayiota (2009) evaluated the e-learning readiness of Cyprus's primary teachers ahead of DIAS web-platform integration into Cyprus's schools. The Cyprus Ministry of Education and Culture (MOEC) aims through DIAS to enhance the integration of elearning

in all areas of the curriculum in primary and secondary education. This study focused on a theoretical framework that evaluated teachers' e-readiness by measuring their technological, psychological and pedagogical readiness for conversion to a blended learning system. The researcher used a questionnaire and an interview survey as principal methods of data collection. The research results revealed that Cyprus' primary teachers need continuous professional development in order to: (a) become psychologically ready to move towards e-learning and (b) to realize how pedagogical practices change in an e-learning environment.

Maruti (2010) in a study, sought to interrogate the level of preparedness among Public Teacher Training Colleges in Kenya to use electronic technology in learning and produce competent teachers to manage e-learning in Kenyan schools. The study adopted a descriptive survey design. The targeted population was five Principals, 311 Tutors and 4,372 students in Baringo, Eregi, Kaimosi, Thogoto and Shanzu Teacher Training Colleges. The population of staff and students in these colleges was 4,678. The researcher obtained 50% of the tutor population and 60% of the student population in each college. Stratified random sampling was used to select tutors and students. Purposive sampling was used to select the principals. This gave a sample size of 2,787 respondents comprising of 155 tutors and 2,632 students. Questionnaires and observation schedules were used as research instruments to collect data. Findings of the study indicated that colleges had inadequate infrastructure and were poorly connected to the internet. Tutors and students lacked skills to use technology in learning- an indication that they were not ready to roll out E-learning in colleges. Overall, the findings showed that Teacher Training Colleges studied in Kenya were not ready for E-learning.

Summak, Baglibel and Samancioglu (2010) assessed the technology readiness of the primary school teachers in Gaziantep, Turkey. Demographics of the teachers were also examined to determine the effect of demographics on the technology readiness level. The

Technology Readiness Index developed by Parasuraman was adopted to measure technology readiness of the teachers. Sample of study was 207 teachers in 11 different schools. The teachers‟ overall technology readiness level was moderate (Mean: 2.96). There were no significant differences in terms of technology readiness across age and subject area of the teachers but significant difference was found between technology readiness and gender.

Qazaq (2012) investigated the degree of the readiness of academic staff towards the implementation of e-learning in universities of Jordan. The questionnaire incorporated items that addressed psychological, administrative, technological, affective and change factors. The questionnaire was administered to 367 academic staff from the north, middle and the south of Jordan. In addition, the researcher interviewed 24 academic staff. Thus, the researcher integrated quantitative and qualitative methods which combined the use of questionnaire and interviews. The researcher used descriptive statistics, one way ANOVA, t-test, correlation and hierarchical regression to analyze the data. The study revealed that the academic staff readiness towards the implementation of e-learning was high. The study also showed that the academic staff was making progress, but more efforts should be made to overcome some hindrances related to infrastructure and lack of e-learning tools. The results also showed that there was no difference in the degree of readiness between academic staff in public and private universities towards applying e-learning. Furthermore, the results indicated that there was no statistically significant difference based on gender, age, experience, type of university and ranks in applying e-learning. On the other hand, the study revealed that technology policy moderated the relationship between e-learning readiness and implementation.

Setati (2012) conducted a research to find out teachers' e-learning readiness in rural South Africa. Theoretical triangulation of Technology Readiness Index (TRI) and Technology Acceptance Model (TAM) a conceptual framework was produced. In the study, TRI's

personality characteristics (optimism, innovativeness, discomforts, and insecurity) and the cognitive dimensions of TAM (perceived ease of use and the perceived usefulness) were used. Four factors affecting the e-learning readiness of teachers' in rural schools were identified: individual factor, technological factor, institutional factor and social factor. The results showed that the three factors (individual factor, institutional factor, and social factor) tend to be critical factors affecting teachers' e-learning readiness and technological factor was perceived as not being important. Thus informed by those factors and the theoretical underpinning, teacher's e-learning readiness framework in rural South African schools was conceptualized.

Vaisla and Pant (2012) in their paper „Government to citizen (G2C) e-readiness of Uttarakhand" investigated about the e-governance initiatives of the state was checked and the perceptions of the citizens towards the effectiveness of Government to Citizen Strategies in Uttarakhand. The findings showed that Government has been ready with its side of the infrastructure and services, and last mile connectivity has proved a challenge. However, in this case it appeared the other way round. Citizens have access to and knowledge about the various technologies and interface solutions that are the citizen-end of the G2C services.

Badri, Mohaidat and Rashedi (2013) measured technology readiness of public school teachers in Abu Dhabi, United Arab Emirates. The study aimed to better understand the factors (mostly demographics) that affect such readiness level. In addition, Abu Dhabi teachers are segmented into mainly five groups with the highest percentage being "laggards" and "explorers". Technology Readiness Index (TRI) developed by Parasuraman was adapted to measure the readiness of teachers. The findings of this study suggested that the TRI could be considered a cross-culturally valid measurement scale for Abu Dhabi teachers too. Sample of study was 796 teachers in 105 different public schools.

The teachers‟ overall mean technology readiness level was 3.5767. With regard to TRI self-perception, there were no significant differences found across subject area of the teachers and the grade level they teach. Significant differences existed with regard to teacher‟s gender, background (nationality), and the number of students a teacher is responsible for. Other variables such as teacher‟s age, experience, education, and work location had partial effects.

Mandana (2013) conducted a study to discover whether Faculty of Letters of Hacettepe University was ready for e-learning. Survey method and questionnaire are used for data collection. Stratified sampling was used to select samples. 146 instructors and 311 senior students participated in the research. Based on previous researches, factors which influence E-learning Readiness were selected as: Availability of technology, use of technology, motivation and acceptance, self confidence and training, as well as institutional readiness. Result revealed that Faculty of Letters of Hacettepe University was not ready to adapt to e-learning. Based on findings, it can be interpreted that students of Hacettepe University Faculty of Letters were ready for e-learning. On the contrary instructors were not ready for e-learning at the same level. According to both instructors and students, Institutional Readiness was not satisfactory. Use of Technology Readiness was lower than expected level for both groups. Acceptance Readiness and Self Confidence Readiness of students were over the expected level, however it was the contrary for instructors. Both instructors and students believed that they need to be trained before launching e-learning applications. Results also showed that discipline, age, status and gender were significant factors for e-learning readiness.

Mndzebele (2013) reviewed teachers' readiness of teaching ICT as a subject, integrating ICT to the other subjects in Swaziland, taking into consideration the challenges encountered in the classrooms. A quantitative research design was used through a questionnaire to collect data from a sample of schools. Systematic sampling was done on

the schools in terms of region, location (urban/rural) and type of school (government, mission / church or community). A qualitative research design was also used to collect data through interviews in all teacher education institutions in the country. The study revealed that the Ministry of Education has to build an education and training system that will support teaching ICT as a subject and ICT integration in teaching and learning.

Ouma (2013) in a study tried to determine the level of e-learning implementation readiness. The study examined technical competency and computer literacy among teachers and students, their attitudes and perceptions towards e-learning, and the existing e-learning infrastructure in schools. Descriptive research was used to obtain information concerning the level of e-learning implementation readiness and to describe the scenario with respect to conditions in schools which benefited from elearning infrastructure funds within Rachuonyo South and Rachuonyo North districts. A census was employed on principals while random, multi-stage stratified sampling using proportionate to population size was applied on students and teachers. Questionnaires were used in this survey and all the 10 targeted principals, 72 teachers from a population of 228 and 170 students from a targeted population of 5061 participated in this study. The research findings showed that teachers and students are ready to embrace e-learning technology, but concerted efforts are necessary to acquire more computers, digital content, and affordable internet connectivity for public secondary schools.

Saqlain, Al-Qarni and Ghadi (2013) used qualitative research study to investigate English language teachers' readiness to integrate technology in Sabt Al- Alaia, Aseer region in Saudi Arabia Intel program has been launched to integrate technology in teaching and learning in Saudi Arabia. 12 in service English language teachers participated in this study. Data was collected through semi structured interviews. Participants complained about lack of funding, scarcity of technology in schools and paucity of proper training to use technology.

Trayek, Ahmad and Nordin (2014) studied the readiness levels of the secondary school teachers in Nablus to adopt e-learning in four important aspects: technological, psychological, equipment, and overall e-learning readiness, and the influence of gender on these aspects. A total of 475 teachers (236 males and 239 females) from 24 secondary schools in Nablus participated in the survey that employed a 23-item questionnaire measuring the readiness constructs on a 5-point Likert scale. The results showed that secondary school teachers in Nablus were quite psychologically ready to use e-learning, but this aspect was not equally supported by technological and equipment readiness. Technological equipment and psychological readiness were all found to be significant correlates of e-learning readiness with quite strong influences. Statistically significant gender differences were detected for technological equipment and overall e-learning readiness, but not for psychological readiness. However, the magnitude of the differences was considered small based on the interpretation of Cohen‟s d for effect sizes. The findings have important implications on what the Palestinian Ministry of Education and Nablus school principals need to put in place in order to better prepare their teachers and schools for e-learning.

Alaattin (2015) investigated e-learning readiness of 1172 family medicine physicians in Turkey. A cross-sectional survey was delivered online. The results showed that overall five areas where Turkish FM physicians were ready but need few improvements: equipment/infrastructure, Online learning style readiness, technological skills readiness, cultural readiness, financial readiness. Three areas were not ready and need some work to improve their readiness: Human resource readiness, attitude readiness, and environmental readiness. The overall results show that the e-learning readiness level at Turkish FM physicians has been 68.28 %, and ready but needs a few improvements for e-learning.

Bahri (2015) conducted a study to find out the level of life satisfaction of women school teachers at different levels (high, average and low) of technology readiness and at different

levels (high, average and low) of modernity. The sample comprised of 600 women school teachers chosen from 30 randomly selected schools (15 Government and 15 private schools) of Chandigarh, India. The one way ANOVA was used to analyse the data. Major findings of the study revealed that Private women teachers were more techno savvy and modern in their personal and professional outlook. Women school teachers of both types of school were almost equally satisfied in their lives. Those women school teachers who were high scorers in technology readiness scale and modernity scale, also have high level of Life satisfaction.

Lin, Lin and Lee (2015) assessed the technology readiness of elementary school teachers in Taoyuan County, Taiwan. The Technology Readiness Index developed by Parasuraman was adopted to measure the technology readiness of teachers. A stratified convenience sampling method was used to collect 478 effective samples from 20 schools. The results showed that in terms of optimism and innovation in technology readiness, there were clear differences among teacher seniority, the most used social websites, and the time spent on Facebook. The four facets of technology readiness, i.e., optimism, creativity, insecurity, and discomfort, all possess prediction ability with respect to the intention of using Facebook for class management. Among these, optimism had the highest prediction value with its overall explanatory power reaching 44%. The elementary school teachers were categorized in terms of technology readiness, and the group of pioneers had the highest ratio of 12.97%.

Sitienei (2015) analyzed the status of e-learning readiness in public primary schools in Athi River Sub-County, Machakos County, Kenya given the government‟s plans to provide schools with ICT equipment for use in instruction under the Laptop Computer Project (LCP). The study described challenges in adopting e-learning and the relationship between e-learning readiness and ICT usage. The study adopted a census survey design by gathering data from all the 35 public primary schools in Athi River Sub-County. The data

was collected for this study from 46 head teachers/teachers using structured questionnaires in a drop and pick later method. The obtained data was analysed using descriptive statistics. The findings showed that schools in Athi River Sub-County were not ready to roll out LCP presently, since their e-learning readiness is low given that teachers are currently inadequately trained and the schools have insufficient basic ICT infrastructure and equipment, such as internet connectivity, computer laboratories and Laptops/Tablets/Computers. Furthermore the schools neither have e-learning content nor an ICT curriculum.

Fuad, Ahmad, Nordin, Mohammed and Ali (2016) highlighted the results of an exploratory factor analysis procedure applied on the e-learning readiness data obtained from a survey of four hundred and seventy-nine (N=479) teachers from secondary schools in Nablus, Palestine. The data were drawn from a 23-item Likert questionnaire measuring e-learning readiness based on Chapnick's conception of the construct. Principal Axis Factoring (PAF) with Promax rotation applied on the data extracted four distinct factors supporting four of Chapnick's e-learning readiness dimensions, namely technological readiness, psychological readiness, infrastructure readiness and equipment readiness. Together these four dimensions explained 56% of the variance. These findings provide further support for the construct validity of the items and for the existence of these four factors that measure e-learning readiness.

Mosa, Mahrin and Ibrrahim (2016) focused on the various components of e-learning readiness. E-learning readiness involves many components of e-learning, including students, lecturers, technology and the environment, which must be ready in order to formulate a coherent and achievable strategy. One of the aspects of e-learning readiness is technological readiness, which plays an important role in implementing an effective and efficient e-learning project. This paper explored the gaps in the knowledge about the technological aspects of e-learning readiness through the conduct of a literature review. In

particular, the review focused on the models that have been developed to assess e-learning readiness.

Marliani, and Bandung, (2016) in a study used Aydin & Tasci model as a tool to conduct an E-learning readiness survey on 115 respondents (Teachers and Students) in 17province all over Indonesia and compared the score of this survey with Aydin & Tasci Level of E-learning Readiness. Result of overall readiness measurement showed that mean scores were 4.05 for students and 4.13 for teachers or 4.09 as total mean score. It indicated that the respondents were ready to implement digital learning although it still needs some improvement. Technology factors got the highest score while innovation factor got the lowest score. This result might be due to the lack of new learning system socialization to the users and ability of users to adapt with new technology.

Navani and Ansari (2016) conducted a study to assess the e-learning readiness of teachers of a premier State Agriculture University (SAU) in India. Stratified random sampling with proportional allocation method was used to select the respondents. The results indicated that the teachers of the SAUs under study were ready but needs little improvement regarding e- learning readiness. Further, teacher‟s age, gender, annual income, teaching experience, computer literacy, achievement motivation and attitude towards e-learning had a positive correlation with e-learning readiness (ELR) whereas educational qualification and designation had negative correlation. Further, coefficient of determination (R2 =0.784) indicated that all the independent variables included in the study sample significantly contributed in their ELR to the extent of 78.4 per cent.

Kolo and Zuva (2020) assessed e-learning readiness of the South African schools in previously disadvantaged schools in Gauteng. A twenty-nine (29) item questionnaire was used to obtain the data. The new learning method was introduced and implemented by Gauteng Department of Education. The data obtained from the questionnaires was then analyzed by using a STOPE model. The results obtained by using STOPE showed that the

learners are 78% ready as compared to 74% of educators. The five-point Likert scale showed a 3.91 average learners' readiness as well as a 3.69 average educator's readiness. Thus, it is evident that the educators are generally less receptive to adopting e-learning than the learners.

Duygu (2020) conducted a study to determine maker teachers' attitudes towards elearning, as well as their levels of readiness to implement it. Their attitudes and level of readiness will be evaluated by the use of several demographic variables. 104 Turkish maker teachers of different ages, who had different professional experiences, were participated in the study. "The Personal Information Form" made up of 11 questions, a 5 point Likert scale survey made up of 20 questions titled "Scale Survey about General Attitudes Towards E-Learning" and a 7 point Likert scale survey made up of 33 questions, titled "Scale Survey about Level of Readiness for E-Learning" were used as data gathering instruments. Descriptive (f, %, M) and procedural analyses (t-test, ANOVA) were made, with the help of the SSPS program. The results of these analyses demonstrate that in general, maker teachers have a positive attitude towards e-learning and that they have a high level of readiness for e-learning.

Farazkish and Montazer (2020) studied e-learning readiness of human resources in Iranian Universities. They assessed readiness of faculty members and students for using ELSs in academic environments. They formulated various appropriate readiness assessment measures of e-learning readiness and gathered readiness data from 8 Iranian comprehensive universities through a survey. According to the average score and importance grade of each measure, they calculated the readiness level of faculty members and students in the selected universities for each measure. The results indicated that the score of over 25% of the students‟ readiness measures and about 40% of the faculty members‟ readiness measures were "less than medium" and both total average scores were "medium". These results confirm that the policy-makers and deans of universities should

be aware of the ELSs benefits, the human resources empowerment mechanisms, and the level of access of instructors and learners to the network facilities.

Indhumathi (2020) conducted a study among lecturers and students of art and science colleges of Chennai, India with the objectives to identify the level of e-learning readiness and is there any significant difference between the level of e-learning readiness of lecturers and students. Sample size was 91, with both male and female lecturers (n = 48) and students (n = 43). E-learning Readiness Scale developed by Moftakhari (2013) was used. The scale has two forms for both teachers and students and measures four dimensions: Use of technology readiness, perceived self-confidence, e-learning acceptance and belief towards training requirements. Independent measures t-test was done. Results showed that most of the lecturers and students have access to basic facilities which is needed for e-learning. Lecturers and students were found to be equal in their technology readiness and perceived self confidence. Lecturers were significantly high on e-learning acceptance compared to students. And students‟ belief towards training requirements of e-learning was significantly high compared to lecturers. It showed that students need to be given proper education and training on elearning to be ready to accept and adapt e-learning. The lesser belief of training requirements in lecturers also needs to be addressed to check if they are fully equipped for efficient use of e-learning tools.

Mokaripour, Shokrpour and Bazarafkan (2020) conducted a study to evaluate the cognitive, psychomotor, and attitudinal readiness of faculty members and students of Shiraz University of Medical Sciences for using e-learning. It was a cross-sectional study. Sample consisted of 379 students and 281 professors selected through the systematic random sampling. The e-learning readiness questionnaire developed by Zarif Sanaei et al. was used to evaluate the students‟ and teachers‟ viewpoints. The results showed that the average level of skill, knowledge, and attitude among students and teachers was positive and higher than the mean ($P < 0.05$). It had only a significant relationship in the level of

education of the teachers and the marital status of the participants. There was also a significant interaction between skill, knowledge, and attitude.

Ezinwa (2020) examined the opinions of academic staff of the University of Ibadan Nigeria regarding the preparedness of stakeholders of e-learning in Nigeria. Data was collected from 240 lecturers using a questionnaire. The lecturers considered e-learning as an add-on, as they expressed inability to integrate e-learning into their present task and do not even have the time to do so. Lecturers‟ assessment of e-readiness of students indicated that the lecturers were undecided on whether the students actually know what e-learning is, and have sufficient IT and web skills required to drive e-learning. However, lecturers have confidence in the IT capacity of their institutions and their IT staff regarding e-learning. Students‟ readiness and human resources readiness were not significant factors influencing lecturers‟ opinions about readiness of Nigerian universities towards the adoption of e-learning. But public/society readiness, financial readiness, training readiness, ICT-equipment readiness, and e-learning material/contents readiness were significant influencers on readiness of Nigerian universities towards the adoption of e-learning.

Makworo, Kwamboka and Morara (2020) tried to establish the e-readiness of primary schools implementing use of digital devices in Kisii County. Survey research design was applied in the study. The population of the study constituted of 710 primary school head teachers, 1,420 standard one and two teachers and 71,000 standard one and two pupils. Sample size was determined using the Fisher formula and the sample consisted of 249 primary school head teachers, 302 standard one and two teachers and 381 standard one and two pupils. Purposive sampling was used to select schools, head teachers and teachers. Simple random sampling was used to select the specific schools to include in the study and proportionate sampling was used to determine the number of respondents from each school. The research instruments applied in the research included self-administered

questionnaires for teachers and head teachers and interview schedules for pupils. To ascertain the reliability of the research instruments, a pilot test was carried out and a Cronbach‟s alpha coefficient of 0.76 was realized. Data was analysed qualitatively and quantitatively using descriptive statistics in SPSS. The research established that the main impediment to implementation of the DLP was the psychological and financial readiness within the schools. There should be a well planned training schedule for teachers and a budget be put in place for the primary schools for the DLP.

Ayele and Birhanie (2020) investigated e-learning readiness of technology institutes in Ethiopia. Data was gathered from five technology institutes of Ethiopian universities. 400 teachers were sampled using simple random sampling method. An E-learning readiness level of those institutes has been assessed from the teachers‟ perspective. In terms of employee readiness, academic institutions have achieved the heist readiness index in general. This indicated that teachers were ready to go ahead for implementing e-learning. Particularly, employee readiness parameters like technical skill, awareness and attitudinal readiness were found to be above the expected level of readiness. Whereas, organizational readiness in general was found below the expected level that indicated academic institutions were not ready and needs some work to get ready. Particularly, all organizational readiness parameters like cultural, policy, top management and technological readiness were found to be below the expected level of readiness.

Lakshmi, Das and Majid (2020) assessed the e-learning readiness of the stakeholders of higher educational institutions of Gujarat, India. Data was collected (physical/e-form) through a self-developed questionnaire from a sample of 12 lab administrators, 83 teaching staff and 153 students belonging to 35 colleges of Gujarat which are using the e-learning practices. Frequency, percentage and intensity index were used to analyze the data. Majority of the stakeholders have a positive perception towards e-learning and believe that it has many benefits. However, they feel that e-learning helps to a lesser extent in

maintaining transparency, face to face contact and interactivity. These factors may hinder their readiness towards e-learning. Also unreliable technology and lack of faculty members‟ confidence and expertise to use this platform in teaching environment are seen as biggest barriers in e-learning. Hence, there is an immediate need to plan for training programmes which will help in improving the confidence of faculty members in using this platform and would increase their e-learning readiness.

Eltayeb (2020) investigated the real use of e-learning applications and the e-learning readiness of faculty members of Qassim University (QU), Kingdom of Saudi Arabia. 113 faculty members participated in a study. The statistical method including comparing means and Pearson's correlation coefficient were used for data analysis. Findings of research showed that most of the faculty members have personal computers (96%), and they are familiar to use them in e-learning (75%). Most of the faculty members have a positive opinion on e-learning. Most of the faculty members have a readiness of more than (93%) percentage to use the e-learning tools in teaching activities in their courses. There is no difference in the gender of the faculty member on e-learning readiness. There is no difference in the nationality of the faculty member, whether Saudi or non-Saudi, on e-learning readiness. The teaching specification even social art field or applied sciences field does not represent an orientation on the use of e-learning tools. The number of courses taught and the credit hours adopted influences the faculty's readiness for e-learning.

Irgatoglu (2021) investigated the relationship between instructors' engagement in professional development activities, their attitudes towards professional development, and their readiness for self-directed learning. The study was designed in both correlation model and descriptive comparative model. Sample was composed of 271 instructors of the English language working at state universities in Ankara, Turkey. SPSS 22 was used to analyze data and the results indicated that the level of participation of instructors in continuous professional development activities was not high. Besides, collaborative

activities were the least preferred ones while reflective activities were the most preferred ones. Instructors had positive attitudes towards professional development while their attitudes did not differ significantly in terms of gender. Instructors' levels of self-directedness were high and it does not differ significantly in terms of gender. The attitudes towards professional development activities, and self-directed learning readiness together exhibited a significant relationship with participation in all continuous professional development activities.

Lakshmi (2021) studied the readiness of higher education faculty members towards elearning in terms of their technological readiness, pedagogical readiness, resource readiness and attitude. A self developed Likert scale consisting of 62 items measuring various dimensions of e-learning readiness was used to collect the data from 421higher education faculty members of Gandhinagar district, Gujarat, India. The findings of the study revealed that demographic factors like age, gender, level of education, designation and discipline does not have any significant influence on the e-learning readiness scores of faculty members while teaching experience had a significant influence. The overall score of e-learning readiness was found to be satisfactory. The technological readiness of faculty members was found to be high compared to their other e-learning readiness dimensions scores.

Lucero, Victoriano, Carpio and Fernado (2021) determined the level of e-learning readiness of students and faculty members of private and Government managed colleges and universities in the Philippines. They tried to find out a significant difference in the level of readiness between the private and Government HEI‟s. In line with this, a descriptive-comparative method was employed. A questionnaire from the works of Aklaslan and Merca was utilized to determine the faculty members and students' status of their e-learning readiness, acceptance, training, technological infrastructure, and tool awareness on the implementation of an e-learning program. Weighted mean was used to

determine the level of readiness while t-test was employed to determine if there was a significant difference between results. The finding showed that the faculty from both public and private universities registered high level of elearning readiness.

Paliwal and Singh (2021) assessed higher education institutions (HEIs) teachers‟ readiness to handle online education based on the online teaching readiness competencies model. A structured questionnaire has been adopted to survey and collect data from 296 teachers of HEIs across India. The questionnaire consisted of 29 constructs. The constructs in this section were measured using a five-point Likert scale ranging. In the first step first-order confirmatory factor analysis (CFA) is carried out, by using the software IBM AMOS-26. The initial model generated for five constructs and outcomes were used to analyze the model‟s goodness of fit and construct validity. In the second step structural equation modelling (SEM) is carried out to do the path analysis of the proposed model. The findings connoted that the level of course design competencies, communication competencies, time management competencies were not sufficient among the teachers of HEI of India, whereas the technical competencies possessed by the teachers meet the requirements for readiness to handle online education. The research is an attempt to provide possible explanations for establishing relationships between the constructs and discusses the usage of information, which can be further used to enhance the online teaching readiness competencies for the teachers of HEIs of India.

Aban and Nicart (2022) conducted descriptive research to understand readiness of teachers as they implement teaching using flexible and blended learning as basis for an education strategy especially in this COVID-19 pandemic. The respondents were 232 selected secondary teachers in the province of Camarines Norte, Philippines. The result showed that there were 20 percent who were prepared for online teaching and most had gadgets/devices to be able to perform their online role as a teachers. However, 80 percent of respondents had issues especially along the financial implication of flexible/blended

learning as internet was quite costly in the Philippines and technological gadgets were expensive.

Ilic (2022) conducted a study to investigate the impact of a course that included ICT skills on the online learning readiness of pre-service teachers in a completely distance education environment. Single group pre-test post-test model was adopted. The study was conducted on 123 pre-service teachers of Turkey. The E-Learning Readiness Scale for College Students was used to collect the data. Furthermore, the course academic achievement final scores of the participants were employed. The study findings demonstrated that total online learning readiness and sub-dimension scores increased after the Information Technologies Course. It was found that there was no difference across the scores based on gender. The academic achievement of female students were higher. At the beginning of the term, it was revealed that ease of use, online learning readiness and computer self-efficacy, internet self-efficacy and learner control variables varied based on personal computer ownership. At the end of the term, both these variables and academic achievement did not differ across personal computer ownership. There was a correlation between the ease of use variable and online learning readiness both at the beginning and the end of the term. On the other hand, there was no correlation between the academic achievement and ease of use or online learning readiness.

Roy and Mohapatra (2022) attempted to understand the perceptions of Indian preservice teacher trainees towards computer mediated learning after two months of exposure to synchronous online classes in 2020 that came along with the outbreak of the COVID-19 pandemic. The survey-based approach employed Likert-rating scales (and items) and open-ended questions to elicit the experiences of 180 final-year students enrolled in pre-service teaching courses at Regional Institute of Education (a constituent unit of the National Council of Educational Research and Training) Bhubaneswar, Odisha, India. The semi-qualitative analysis of the responses reported that more than one third of the pre-

service trainee teachers (36.6 %) considered online classes as a poor mode of teaching while 32.8% of respondents embraced online classes as a good mode of learning for future generations. About one-third (30.6%) are in a state of confusion.

Warmansyah, Komalasari, Febriani, Gusmiati and Amalina (2022) conducted a study to find empirical information about the effect of Technological Pedagogical Content Knowledge (TPACK), and Technology Integration Self Efficacy (TISE) on Teacher Readiness for Online Learning (TROL). Study used a quantitative survey method with path analysis techniques. This study measured the readiness of kindergarten teachers in distance learning in Tanah Datar Regency, West Sumatra Province, Indonesia with a sampling technique using simple random sampling involving 105 teachers. Empirical findings reveal that; (1) there was a direct positive effect of Technology Integration Self Efficacy on Teacher Readiness for Online Learning; (2) there was a direct positive effect of TPACK on Teacher Readiness for Online Learning; (3) there was a direct positive effect of Technology Integration Self Efficacy on TPACK.

2.5 ICT IN TEACHING AND LEARNING PROCESS

This chapter deals with the review of related literature studies conducted in India. In India there are studies in this research which was explained as follows;

Benjamin and Sivakumar (2008) studied the "Interactive Multimedia CD based learning in Physics". Their findings proved that the Multimedia CD based learning was effective. The supremacy of the interactive Multimedia CD based learning courseware was established over the conventional method of instruction.

Jagannath Dange (2013) has been studied of Effectiveness of Computer-Assisted instruction in the development of Study Habits in relation to the Gender, Locality and Socio-Commerce Status of Secondary School Students. The purpose of this study was to find out the effectiveness of Computer-Assisted Instruction in the development of Study Habits in relation to Gender, Locality and Socio-Commerce Status of Secondary School

Students. Pre-test, post-test parallel group experimental design was followed and Purposive sampling technique was used to form thirty students each control and Experimental groups. Standard Progressive Matrices [SPM] by Raven.J.C [1988] and Test for Higher Mental Ability in Science (THMAS) by Sansanwal and Anuradha Joshi (1989) were administered to make parallel groups. Computer Assisted Instruction package was developed on IX Science content and same used for experimentation. The t- test and Two-Way Analysis of Variance were used to analyze the obtained data. The result showed that Computer assisted instruction was more effective than conventional method of teaching science in developing Study habits among students. Significant effect of Gender, Locality and Socio-Commerce Status was not found on the development of Study habits when students learnt through Computer Assisted instruction.

He and Xiaojun (2015) found that ICT and Its Application in Rural Junior English Class Superiority in developing students' listening, speaking, etc. This research explored how to provide a better environment for English teaching in rural junior school with the aid of multimedia and find some ways to improve teaching efficiency. In recent years, using multimedia is the direction of reform and mainstream in English teaching. Compared with the traditional English teaching, multimedia-aided English teaching has its incomparable superior environment for English teaching in rural junior school with the aid of multimedia and find some ways to improve teaching efficiency. It based on the research done at home and abroad on the application of multimedia in English teaching, and on the description of the current situation of rural English teaching in China, analyzes how to apply multimedia in rural junior English teaching, and then presents some things to bear in mind when applying multimedia in teaching.

Akay and Turkey (2017) made a study on comprehensive analysis on techno-pedagogical education competency and technology perception of pre-service teachers: relation, levels and views. The findings of the study were: (a) there was a significant relation in positive

direction between competence level of pre-service teachers about techno-pedagogical education and their technological perceptions; (b) there was significant difference between mean scores of pre-service teachers' perception about technology according to English Language Teaching Department; and (c) there was no significant difference between the means of competence level index of pre-service teachers about techno-pedagogical education in terms of gender.

Rupinder (2019) conducted a study on effectiveness of an environmental education programme utilizing ICT in influencing environmental sensitivity awareness ethics and attitudes among secondary school students. findings of the study were: (a) there was no significance of difference between the mean pre-test scores of control and experimental group for environmental sensitivity; (b) there was no significance of difference between the mean pre-test scores of control and experimental group for environmental awareness; (c) there was no significance of difference between the mean pre-test scores of control and experimental group for environmental ethics; and (d) there was no significance of difference between the mean pre-test scores of control and experimental group for environmental attitudes.

Kumar (2020) made a study on attitude and opinion towards using computer technology in teaching among B.Ed. trainees in Tiruchirappalli district. The findings of the study were: (a) there was a significant difference found in B.Ed., trainees attitude towards computer technology in subject teaching between the age of below 25 years as well as above 26 years; (b) there was a significant difference found in B.Ed. trainees attitude towards computer technology in subject teaching between the under graduates as well as post graduates; (c) there was a significant difference found in B.Ed. trainees attitude towards computer technology in subject teaching between rural as well as urban college localities; and (d) there was no significant difference found in B.Ed. trainees opinion towards using computer technology in subject teaching between male as well as female.

Trivedi, Mihir and Bose (2020) conducted a study on the A study of ICT awareness need and use among secondary and higher secondary school teachers of Saurashtra region of Gujarat. The findings of the study were: (a) there was no significant difference in the ICT awareness need and use among secondary and higher secondary school teachers based on the medium of instruction; (b) there was a significant difference in the ICT awareness need and use among secondary and higher secondary school teachers based on the computer training; and (c) there was no significant difference in the ICT awareness need and use among secondary and higher secondary school teachers based on possession of personal computer.

Aghaei and Jangaiah (2021) made a study on the effect of using information and communication technology in improving continuing medical education in Iran. The findings of the study were: (a) there was no significant difference between organizational category and organizational influence in Iran; (b) there was no significant difference between organizational category and professional influence in Iran; (c) there was no significant difference between organizational category and organizational strengths resources in Iran ; and (d) there was a significant difference between organizational category and individual items within the strengths and resources in Iran.

Viju and Simen (2021) made a study on Application of ICT Information Technology and Communication in Communicative Language Learning. The findings of the study were: (a) there was no significant difference in the application of ICT information technology and communication in communicative language learning in use of computers based on their gender; (b) there was no significant difference in the application of ICT information technology and communication in communicative language learning in the having E-mail ID based on their major subject; (c) there was no significant difference in application of ICT information technology and communication in communicative language learning in numbers of computers available for locality of institution; and (d) there was significant

difference application of ICT information technology and communication in communicative language learning in numbers of computers available for type of management.

Ajit and Magesan (2022) made a study on impact of information communication technology on the employees of banks in Virudhunagar district. The findings of the study were: (a) there was significant association between age and problem of using computer based network based on their age; (b) there was a significant association between education and problem of using computer based network based on their education; (c) there was a significant association between area of situation of bank and problem of using computer based network based on their area of situation of bank.

Sayeda, Amra and Mustafa (2022) conducted a study on awareness and use of information communication technology, ICT: comparative study among graduate and postgraduate students of arts and social science faculty. The study reveals that among 90 represents, 45 are UG students of arts and social science faculty. On the other hand, 45 are PG students of Arts and Social science faculty. This study sought to examine the use and awareness of ICT among the UG and PG students of arts and social science faculty, AMU, Aligarh by taking sample of 90 users from the total population of about 3000 students to get an overview of their awareness and use of ICT applications. The study shows that most of the UG and PG students of arts and social science faculty are aware and use ICT applications.

Gopal and Annandan (2022) made a study on the influence of teaching attitude and anxiety towards utilization of information and communication technologies in classroom instruction among teacher educators at colleges of education. The findings of the study were: (a) there was significant difference in the teaching attitude and anxiety among teacher educators based on their gender; (b) there was no significant difference in the teaching attitude and anxiety among teacher educators based on their major subject; (c)

there was a significant difference in the teaching attitude and anxiety among teacher educators based on type of institution; and (d) there was a significant difference teaching attitude and anxiety among teacher educators based on their year of experience in working computer.

Thangarajathi (2023) made a study on internet utilization among B.Ed. students. The findings of the study were: (a) there was no significant difference in internet utilization between the trainees who have already completed the computer course and those who do not; (b) there was no significant difference in internet utilization between aided and self-financing college B.Ed. trainees; and (c) there was no significant difference in internet utilization between rural and urban college B.Ed. trainees.

2.6 INFERENCES OF THE REVIEW

From the above review of Literature and studies in the field of ICT based teaching and learning, the E-readiness are to be evolved. Totally 54 studies have taken in the research. Very few studies are relative to the ICT in teaching learning process at as in the level and no study has been conducted on primary level. Hence, the investigator define the study and to do the investigation that appearance in the following chapter.

CHAPTER-III

RESEARCH METHODOLOGY

3.1 INTRODUCTION

The chapter dealt with statement of the problem, the study's objectives and hypotheses, the methods employed, the operational definition of key terminology and the study's tools are all explained in this chapter. It also goes over the data collection procedure and sample strategy. The study's boundaries and restrictions are discussed in the chapter's conclusion.

3.2 STATEMENT OF THE PROBLEM

The rapid advancement of Information and Communication Technology (ICT) has revolutionized various sectors, including education. Despite the potential of ICT to enhance the teaching and learning process, its integration in primary education remains inconsistent and often inadequate. This disparity raises significant concerns about the e-readiness of primary school teachers to effectively incorporate ICT into their pedagogical practices. E-readiness refers to the preparedness of teachers in terms of skills, attitudes, access to resources, and institutional support necessary to integrate technology into their teaching methodologies.

Primary education is a critical stage in the educational continuum, where foundational skills and knowledge are established. The integration of ICT can foster interactive learning environments, enhance student engagement, and cater to diverse learning needs. However, the successful implementation of ICT in classrooms largely depends on teachers' readiness to embrace and utilize these technologies effectively. Many primary teachers may face barriers such as insufficient training, lack of confidence, inadequate infrastructure, and limited access to up-to-date technological tools. These challenges can hinder their ability to leverage ICT to its fullest potential, ultimately affecting the quality of education delivered to students.

Moreover, the disparity in e-readiness among primary teachers can exacerbate educational inequalities, particularly in under-resourced and rural schools. Teachers in these settings often have less exposure to professional development opportunities and fewer technological resources, further widening the gap in ICT integration. This situation necessitates a comprehensive understanding of the factors influencing e-readiness among primary teachers and the development of targeted interventions to address these issues.

Therefore, this study aims to investigate the level of e-readiness among primary teachers to integrate ICT in the teaching and learning process. It seeks to identify the key barriers and facilitators to effective ICT use in primary education and to explore the impact of various demographic, institutional, and personal factors on teachers' readiness. The findings of this study will provide valuable insights for policymakers, educators, and stakeholders to design and implement strategies that support primary teachers in overcoming obstacles and enhancing their ICT integration capabilities, ultimately improving the quality and equity of primary education.

3.3 RATIONALE OF THE STUDY

The integration of Information and Communication Technology (ICT) in education is recognized globally as a catalyst for enhancing teaching and learning processes. In primary education, where foundational skills and knowledge are established, the effective use of ICT can significantly enrich educational experiences, foster interactive learning, and cater to diverse student needs. However, the successful integration of ICT in classrooms is heavily dependent on the e-readiness of teachers— their preparedness in terms of skills, attitudes, access to resources, and institutional support. This study aims to address the critical issue of e-readiness among primary teachers, as their ability to effectively incorporate ICT into their teaching practices is paramount to achieving educational improvements and equity.

Enhancing Educational Quality

One of the primary reasons for this study is to understand the current state of e-readiness among primary teachers and its impact on the quality of education. ICT has the potential to transform traditional teaching methods, making learning more engaging and effective. By identifying the levels of e-readiness, this study seeks to highlight the gaps in teachers' preparedness and provide insights into how these gaps can be bridged. This understanding is essential for developing targeted professional development programs and support systems that can enhance teachers' ICT skills and confidence, ultimately improving educational outcomes for students.

Addressing Inequities in Education

The study also addresses the significant disparities in ICT integration across different schools and regions. Teachers in under-resourced and rural areas often face greater challenges in accessing and utilizing ICT due to limited infrastructure, insufficient training, and lack of institutional support. These disparities contribute to educational inequities, as students in such schools may not receive the same quality of education as those in better-equipped urban schools. By investigating the factors influencing e-readiness among primary teachers, this study aims to shed light on the specific needs of teachers in different contexts and provide recommendations for policies and practices that can promote equitable access to ICT resources and support.

Informing Policy and Practice

The findings of this study will be valuable for policymakers, educational administrators, and stakeholders involved in the implementation of ICT in education. A comprehensive understanding of the barriers and facilitators to ICT integration from the teachers' perspective will inform the development of more effective policies and strategies. These strategies can include tailored professional development programs, improved access to technological resources, and supportive institutional frameworks that encourage and facilitate the use of ICT in teaching. By providing empirical evidence on the state of e-

readiness, this study will contribute to the formulation of actionable plans that can enhance ICT integration in primary education.

Supporting Sustainable Development Goals

This study aligns with the global agenda for education, particularly the United Nations Sustainable Development Goal 4 (SDG 4), which aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. Effective ICT integration in primary education can play a crucial role in achieving this goal by enhancing learning experiences and outcomes. By focusing on the e-readiness of primary teachers, this study supports efforts to create an education system that is responsive to the demands of the 21st century and capable of preparing students for a technology-driven world.

In conclusion, the rationale for this study lies in the pressing need to understand and improve the e-readiness of primary teachers for ICT integration in the teaching and learning process. By addressing this issue, the study aims to enhance educational quality, promote equity, inform policy and practice, and support global educational goals. The insights gained from this research will be instrumental in developing effective interventions and strategies that empower primary teachers to harness the full potential of ICT, ultimately benefiting students and the broader educational community.

3.4 OPERATIONAL DEFINITION OF KEY TERMS

3.4.1 E-Readiness

E-readiness refers to the preparedness of primary school teachers to integrate Information and Communication Technology (ICT) into their teaching practices. This encompasses teachers' technological skills, attitudes towards ICT, access to technological resources, and the institutional support available to them. E-readiness is measured through surveys assessing teachers' self-reported competence in using ICT tools, their willingness to adopt new technologies, and the availability of necessary infrastructure and training.

3.4.2 Information and Communication Technology (ICT)

ICT in this context refers to the various technological tools and resources used to create, store, exchange, and use information in the teaching and learning process. This includes computers, tablets, interactive whiteboards, educational software, internet resources, and other digital devices and platforms that facilitate educational activities and improve student engagement and learning outcomes.

3.4.3 Integration of ICT

Integration of ICT involves the incorporation of technological tools and resources into the teaching and learning processes in primary education. This includes the use of digital devices and internet resources to enhance lesson delivery, engage students, support individualized learning, and improve overall educational practices. The extent and effectiveness of ICT integration are assessed through observations, teacher reports, and student feedback.

3.4.5 Teaching and Learning Process

The teaching and learning process refers to the interactions and activities through which knowledge and skills are imparted to students in a primary school setting. This process includes lesson planning, instructional delivery, student engagement, assessment of learning outcomes, and feedback mechanisms. The focus is on how these elements are influenced and enhanced by the use of ICT.

3.4.6 Primary Teachers

Primary teachers are educators who teach students in the primary or elementary grades, typically from kindergarten through fifth or sixth grade, depending on the educational system. These teachers are responsible for delivering a broad curriculum that includes subjects such as reading, writing, mathematics, science, social studies, and more. In this study, primary teachers' attitudes, skills and challenges regarding ICT integration are examined.

3.5 OBJECTIVES OF THE STUDY

A research objective is a statement of intent used in quantitative research that specifies goals that the investigator plans to achieve in a study (Creswell, 2012). The objectives of the study are:

1. To find out the level of e-Readiness of Primary Teachers.
2. To find out the level of Integration of ICT in Teaching and Learning Process of Primary Teachers.
3. To find out the level of e-Readiness of primary teachers with regard to gender, location of school and type of school.
4. To find out the level of Integration of ICT in Teaching and Learning Process of primary teachers with regard to gender, location of school and type of school.
5. To find out the significant difference if any between primary teachers in terms of gender, location of school, undergoing ICT training in their e-Readiness of Primary Teachers.

4. To find out the significant difference if any between primary teachers in terms of gender, location of school, undergoing ICT training in their Integration of ICT in Teaching and Learning Process.

6. To find out the significant difference if any among primary teachers in terms of age, type of school, nature of school and years of experience in their e-Readiness of Primary Teachers.

5. To find out the significant difference if any among primary teachers in terms of age, type of school, nature of school and years of experience in their Integration of ICT in Teaching and Learning Process.

6. To find out the significant association between primary teachers in terms of educational qualification in their e-Readiness.

7. To find out the significant association between primary teachers in terms of educational qualification in their Integration of ICT in Teaching and Learning Process.

To find out the significant correlation between primary teachers in their e-Readiness and Integration of ICT in Teaching and Learning Process.

3.6 NULL HYPOTHESES

H_o1: There is no significant difference between male and female primary teachers in their E-Readiness and its dimensions.

H_o2: There is no significant difference between primary teachers from rural and urban schools in their E-Readiness and its dimensions.

H_o3: There is no significant difference between primary teachers from ICT training attended and ICT training not attended in their E-Readiness and its dimensions.

H_o4: There is no significant difference between male and female primary teachers in their Integration of ICT in Teaching and Learning Process.

H_o5: There is no significant difference between primary teachers from rural and urban schools in their Integration of ICT in Teaching and Learning Process.

H_o6: There is no significant difference between primary teachers those who attended and not attended ICT service training in their Integration of ICT in Teaching and Learning Process.

H_o7: There is no significant difference among high school teachers from government, aided and matriculation schools in their E-Readiness and its dimensions.

H_o8: There is no significant difference among high school teachers from boys, girls and co-education schools in their E-Readiness and its dimensions.

H_o9: There is no significant difference among high school teachers having below 10 years, 10-20 years and 21 and above years of teaching experience in their E-Readiness and its dimensions.

H_o10: There is no significant difference among high school teachers having below 25 years, 26-35 years and 36 and above years of age in their E-Readiness and its dimensions.

H_o11: There is no significant difference among high school teachers from government, aided and matriculation schools in their Integration of ICT in Teaching and Learning Process.

H_o12: There is no significant difference among high school teachers from boys, girls and co-education schools in their Integration of ICT in Teaching and Learning Process.

H_o13: There is no significant difference among high school teachers having below 10 years, 10-20 years and 21 and above years of teaching experience in their Integration of ICT in Teaching and Learning Process.

H_o14: There is no significant difference among high school teachers having below 25 years, 26-35 years and 36 and above years of age in their Integration of ICT in Teaching and Learning Process.

H_o15: There is no significant association between primary teachers in terms of educational qualification in their e-Readiness.

H_o16: There is no significant association between primary teachers in terms of educational qualification in their Integration of ICT in Teaching and Learning Process.

H_o17: There is no significant correlation between primary teachers in their e-Readiness and Integration of ICT in Teaching and Learning Process.

3.7 VARIABLES OF THE STUDY

A variable is any feature or aspect of an event or process that, by its presence and nature, affects some other events or process, which is being studied. Two variables involved in this study are survey variable / independent variable and criterion variable / dependent variable (Sharma, 2006).

Independent Variable

- E-Readiness

Dependent Variable

- Integration of ICT in Teaching and Learning Process

3.8 METHOD USED IN THE PRESENT STUDY

The investigator has used survey method in this study "*e* – READINESS' AMONG PRIMARY TEACHERS TO INTEGRATE ICT IN TEACHING AND LEARNING PROCESS".

3.9 POPULATION FOR THE STUDY

Population refers to any collection of specified group of human beings or non-human entities. The population for the present study consists of primary school teachers working in Tirunelveli District.

3.10 SAMPLES FOR THE STUDY

The investigator has used Simple Random Sampling Technique for selecting the sample from the population. In this study sample consists of 217 primary teachers from 20 schools. Among them 55 are male and 162 are female.

3.11 TOOLS USED FOR THE STUDY

By keeping various objectives of the study in mind, the following tools were used by investigator for collecting data.

1. Personal data form prepared by the investigator.
2. E-Readiness Scale constructed and validated by the investigator (2024).
3. Integration of ICT in Teaching and Learning Process Scale adopted from Dr. A. Vences Cyril (2021).

3.11.1 Procedures for Construction of E-Readiness Scale

There are general principles and procedures which one has to follow while construction of the tool, were described under different heads such as

i. Planning

ii. Item writing

iii. Preliminary draft

iv. Establishing the validity

v. Item analysis

vi. Establishing the reliability

vii. Final draft

i. Planning

The construction of the tool was started by the consideration of the limitations under which the tool have to be developed. It included detailed set of specifications as to the purpose of the tool and the time cost and sources at the disposal of the investigator. The nature of the population, the length of the tools, type and nature of the tools, items and method of scoring the test were some basic consideration which were taken into account in advance. The investigator for his study decided to construct the following tool on E-Readiness scale. Items were planned to prepare under six dimensions namely Psychological Readiness, Technological Readiness, Content Readiness, Equipment Readiness, Financial Readiness, Human Resource Readiness. It was planned to prepare the tool on the basis of Likert like five point rating scale. A Likert item is simply a statement which the respondent is asked to evaluate according to any kind of subjective or objective criteria: generally the level of arrangement or disarrangement is measured.

ii. Item Writing

After a thorough and careful study of books, articles, e-journals, magazines, old tools, research publications and newspapers related to E-Readiness scale, the investigator prepared a number of items, consisting of statements covering content of the tool.

iii. Preliminary Draft

The investigator prepared 72 items for the E-Readiness scale. The preliminary draft tool was enclosed (Appendix). The items were edited and carefully worded with

instructions which indicate briefly the nature and purpose of the tool. The final manuscript of the preliminary draft was given to three educational experts and one science expert for their opinion. Ambiguous and overlapping items were modified based on their suggestions. After the necessary modifications, the preliminary draft was printed. The investigator showed the research tool to the people to verify the suitability of the items. The distributions of items for six dimensions namely, Psychological Readiness, Technological Readiness, Content Readiness, Equipment Readiness, Financial Readiness, Human Resource Readiness in the preliminary draft was as follows in table.

Table 3.1

DISTRIBUTION OF ITEMS IN E-READINESS SCALE

Sl. No.	Dimensions	Priliminary Draft	
		Positive Items	**Total Items**
1.	Psychological Readiness	14	14
2.	Technological Readiness	14	14
3.	Content Readiness	12	12
4.	Equipment Readiness	11	11
5.	Financial Readiness	9	9
6.	Human Resource Readiness	14	14
E-Readiness Scale		**74**	**74**

iv. Establishing the Validity

"Validity refers to the degree to which evidence and theory support the interpretation of test scores entailed by proposed uses of test" (Best and Khan, 2006). The validity of the tool has been found through face validity for the tool.

a. Face Validity

The preliminary draft tool of the variable namely, E-Readiness scale was given to experts in technology who examined the different items of the tool and their opinions was highly solicited. It was given to an expert in biology for further scrutiny. Their suggestions regarding the suitability and standard of language are considered. Thus the face validity of the tool was established.

v. Item Analysis

For selecting the relevant and consistent items to the tool, the investigator administered the tool to 50 subjects of the sample and computed the item Vs whole correlation. The row and the column of the table were assigned for the number of respondents and the items in the preliminary draft of E-Readiness scale scores of each respondent were recorded item wise in the table. The sums of the scores obtained by all the respondents were calculated individually. The co-efficient of correlation between each item by all the scorers and the sum of scores of all items for the each scorer was calculated using the Pearson Product Moment Correlation. The items, which were having value above 0.278 (the table value of correlation co-efficient (γ) is 0.278 for 48 df at the 5% level of significance) were selected and other items were deleted. The correlation values of draft tool was given in the table.

Table 3.2

CORRELATION VALUE OF ITEM VS WHOLE CORRELATION IN E-READINESS SCALE

Item No.	' γ ' value	Remarks	Item No.	' γ ' value	Remarks
1.	0.377	Selected	38	0.590	Selected
2.	0.472	Selected	***39**	0.579	Selected
3.	0.503	Selected	***40**	0.503	Selected
4.	0.579	Selected	41	0.579	Selected
5.	0.590	Selected	42	0.590	Selected
6.	0.579	Selected	43	0.579	Selected
7.	0.441	Selected	44	0.441	Selected
8.	0.404	Selected	45	0.404	Selected
9.	0.390	Selected	46	0.390	Selected
10.	0.297	Selected	47	0.297	Selected
11.	0.496	Selected	48	0.496	Selected
12.	0.562	Selected	49	0.562	Selected
*13.	**0.163**	**Deleted**	*50	**0.163**	**Deleted**
*14.	**0.246**	**Deleted**	*51	**0.246**	**Deleted**
15.	0.402	Selected	52	0.402	Selected
16.	0.472	Selected	53	0.441	Selected
17.	0.579	Selected	54	0.404	Selected
18.	0.441	Selected	55	0.390	Selected
19.	0.505	Selected	56	0.297	Selected
20.	0.402	Selected	57	0.496	Selected

21.	0.470	Selected	58	0.562	Selected
22.	0.472	Selected	*59	**0.263**	**Deleted**
23	0.496	Selected	*60	**0.046**	**Deleted**
24	0.562	Selected	61	0.402	Selected
25	0.505	Selected	62	0.441	Selected
26	0.622	Selected	63	0.404	Selected
*27	**0.163**	**Deleted**	64	0.441	Selected
*28	**0.246**	**Deleted**	65	0.505	Selected
29	0.505	Selected	66	**0.163**	**Deleted**
30	0.622	Selected	67	**0.246**	**Deleted**
31	0.505	Selected	68	0.472	Selected
32	0.622	Selected	69	0.496	Selected
32	0.505	Selected	70	0.562	Selected
33	0.622	Selected	71	0.505	Selected
34	0.377	Selected	72	0.622	Selected
35	0.472	Selected	73	**0.028**	**Deleted**
36	0.503	Selected	74	**0.128**	**Deleted**
37	0.579	Selected			

Note: *Deleted Items

vi. Establishing the Reliability

According to Sharma (2004), "Reliability refers to whether a test is internally consistent (i.e.) consistency of scores obtained throughout the test when administered one or how accurately is the test measuring at a particular time". In the present study, the investigator employed test re-test method for establishing reliability for the tool.

Test-Retest Method

To establish the reliability of E-Readiness by test-retest method, it was administered to 50 primary teachers at PUPS, Reddiyarpatti and it was re-administered to the same set of teachers after an interval of 15 days. The two sets of scores were correlated using Pearson product moment correlation and the value was found to be 0.806, which is substantial. So the tool is considered as high reliable. Since the 'γ' value for each variable is more than 0.80 the tool was highly reliable.

vii. Scoring Procedure

The scoring was done with the key which was prepared by the investigator for the tool. In the E-Readiness Scale, 62 items are present in this scale. It is a five point scale. The respondent has to choose any one from the given five responses namely, i) Strongly Agree, ii) Agree, iii) No idea, iv) Disagree and v) Strongly Disagree. Thus the maximum score obtained by a sample was 310 and the minimum score obtained by a sample was 62. The scoring key for E-Readiness Scale is given in the table.

Table 3.3

SCORING KEY FOR E-READINESS SCALE

Nature of the Items	**Strongly Agree**	**Agree**	**No Idea**	**Disagree**	**Strongly Disagree**
Positive	5	4	3	2	1

viii. Final Draft of the Tool

After establishing the reliability and validity of the tool the investigator printed the tool for the data collection. The particulars of the E-Readiness are given in the table. The final draft tool was enclosed (Appendix).

Table 3.4

DISTRIBUTION OF ITEMS IN E-READINESS

Sl. No.	Dimensions	Final Draft	
		Positive Items	**Total Items**
1.	Psychological Readiness	12	12
2.	Technological Readiness	12	12
3.	Content Readiness	10	10
4.	Equipment Readiness	9	9
5.	Financial Readiness	7	7
6.	Human Resource Readiness	12	12
E-Readiness Scale		**62**	**62**

3.11.2 Tool – 2: Integration of ICT in Teaching Learning Process Scale

This is a standardized tool prepared by Dr. A. Vences Cyril in the year 2021. It consists of 30 statements, all of these are positive statements. This tool comprises some dimensions such as technological dimensions, pedagogical dimensions, professional development dimension, administrative and policy dimension, curriculum design and cultural and social dimension. The itmes were clubbed and it was prepated 30 items.

TABLE 3.5

DISTRIBUTION OFITEMS IN INTEGRATION OF ICT IN TEACHING LEARNING PROCESS SCALE

Sl. No.	Variable	List of Items	Total No. of Items
1.	Integration of ICT in Teaching Learning Process	1 - 30	30
Total			**30**

Validity and Reliability

The responses were scored from 50 primary teachers and the co-efficient of correlation between the two sets of scores was calculated. The reliability co-efficient was found to be 0.78. Thus the reliability of the tool has been established by test-retest method.

Scoring Procedure

The items in the Integration of ICT in Teaching Learning Process Scale included 40 positive statements. It is a three point scale. There is no negative statement in the questionnaire. The student has to choose any one from the given three responses namely, (i) Agree, (ii) Undecided and (iii) Disagree. All the Statements are scored as follows:

TABLE 3.6

SCORING KEY OF INTEGRATION OF ICT IN TEACHING LEARNING PROCESS SCALE

Sl. No.	Response	Score value
1.	Strongly Agree	5
2.	Agree	4
3.	Undecided	3
4.	Disagree	2
5.	Strongly Disagree	1

Thus the maximum attainable score by a sample is 150 and the lowest attainable score is 30.

3.12 STATISTICAL TECHNIQUES USED

The investigator used the following statistical techniques for analyzing and interpreting the data.

1. Percentage analysis

The percentage analysis has been used to find the students having Low, Moderate and High level of E-Readiness and Integation of ICT in Teaching Learning Process among Primary Teachers.

Levels

High level	=	the scores with above Mean + 1 SD
Moderate level	=	the scores between Mean ± 1 SD
Low level	=	the scores below Mean – 1 SD

2. 't' Test

't' test is used to find out the significant difference between the means of two groups. If the 't' value is below a cut-off point (depending on the degrees of freedom) the differences, in means is considered not significant, and the null hypothesis is accepted. When the 't' value exceeds a cut-off point, the difference is side to be significant and the null hypothesis is rejected (Bhandarkar, 2006).

3. Chi- square (χ^2) test

It is to find out the association between the variables, while interpreting the calculated value of χ^2 is compared with the table value. For these degrees of freedom are essentially calculated. Degrees of freedom means the number of classes to which the values can be assigned arbitrarily or it will without violating the restriction or limitation placed.

4. Pearson's Product Moment correlation

"Correlation is refers to relationship between two or more paired variables" (Bhandarkar, 2006).

3.13 TABULATION OF RESPONSES

The data collected was scored as per the norms established and the responded items were scored on the basis of scoring key in the form of matrix table. The scored data's were fed into the computer and analyzed using IBM SPSS Statistics Version 22.

3.14 CONCLUSION

In this chapter, the researcher had attempted to discuss the procedures and methodology undertaken to generate the data for verifying the hypotheses formulated for the present study. Further this chapter presents the different stages of data collection and manipulation of experimental variables to generate the data.

CHAPTER-IV

DATA ANALYSIS AND INTERPRETATION

4.1 INTRODUCTION

Data is information which is called with a specific purpose. After the collection of data through the use of appropriate tools and techniques, the next step in the analysis and interpretation of data. Analysis of data means studying the tabulated material in order to determine inherent facts or meaning. Large amount of materials should be broken down into smaller units and rearranged in new combinations to discover new factors and relationship. Data should be studied from as many angles as possible to find out new facts.

According to Barr, 'Analysis is an important phase of the classification and summarization of the data' (Kotari, 2004). The process of interpretation is essential for stating what the results convey. Thus interpretation involves essentially subjective reactions of the research while attempting to derive meaning from the 'objective data' in possession. It calls for a critical examination of the results of one's analysis in the light of all the limitations of data gathering. Interpretation is the most important step in the tool procedure of research and is purely subjective. The analysis and interpretation of data represent the application of deductive and inductive logic to the research process.

4.2 NEED FOR THE DATA ANALYSIS

After administering the tool to the selected sample of individual, the data are collected and organized. The collected data are known as raw data. Analysis of data means to make the raw data meaningful or to draw some results from the data after the proper treatment, Null hypothesis are tested with the help of analysis of data so to obtain some significant results. Analysis of data and its interpretation p ossess a very important role in the research process. A number of statistical methods assist the investigator to interpret the results. A good analysis leads to good interpretation and it ultimately leads to a good research. Statistics is the body of mathematical for gathering, describing, organizing and

interpreting numerical data. Research in education may deal with two types of statistical application

i. Descriptive Statistics analysis

ii. Inferential Statistics analysis

Descriptive statistics is used to describe the main features of the data in quantitative terms they provide simple summaries about the sample and the measures. Descriptive statistical analysis limits generalization to the particular group of individuals observed. No confusions are expended beyond this group, and any similarity to those outside the group cannot be assumed. The data describe one group and that group only. Much simple action research involves descriptive analysis and provides valuable information about the nature of a particular group of individuals. Under descriptive statistics mean, median, mode, standard deviation were calculated for 217 samples of primary school teachers.

Inferential statistics deals with drawing conclusions and in some cases, making predictions about the properties of a population based on information about the relationship between data. They are also used to investigate difference between and among groups. However, one must understand the inferential statistics by itself does not prove causality. Such proof is always a function of a given theory and it is vital that such theory be clearly stated prior to using inferential statistics, one is trying to reach conclusions that extend beyond the immediate data.

For instance, inferential statistics is used to infer from the sample data what the population might think or inferential statistics is used to make judgments of the probability that an observed difference between groups is a dependable one or one that might have happened by chance in this study. Thus, inferential statistics is useful to make inferences from the data to move to general conditions.

4.3 DATA ANALYSIS

To find out the level of Integration of ICT in Teaching and Learning Process of Primary Teachers.

Table 4.1

Level of Integration of ICT in Teaching and Learning Process of Primary Teachers

Integration of ICT in Teaching and Learning Process		
	Frequency	**Percent**
Low	39	18.0
Moderate	146	67.3
High	32	14.7
Total	**217**	**100.0**

It is inferred from the above table that 18.0% of primary teachers have low, 67.3% of them have moderate and 14.7% of them high level of Integration of ICT in Teaching and Learning Process.

2. Level of Integration of ICT in Teaching and Learning Process of Primary Teachers with respect to Gender

Table 4.2

LEVEL OF INTEGRATION OF ICT IN TEACHING AND LEARNING PROCESS OF PRIMARY TEACHERS WITH RESPECT TO GENDER

Variable	Category	Low		Moderate		High	
		N	%	N	%	N	%
Integration of ICT in Teaching and Learning Process	Male	14	21.5	35	60.6	6	18.0
	Female	25	10.4	111	78.6	26	11.0

It is inferred from the above table that 25.5% of male and 15.4% of female primary teachers have low, 63.6% of male and 68.5% of female students have moderate and 18.0% of male and 11.0% of female primary teachers have high level of Integration of ICT in Teaching and Learning Process.

3. Level of Integration of ICT in Teaching and Learning Process of Primary Teachers with respect to Location of School

Table 4.3

LEVEL OF INTEGRATION OF ICT IN TEACHING AND LEARNING PROCESS OF PRIMARY TEACHERS WITH RESPECT TO LOCATION OF SCHOOL

Variable	Category	Low		Moderate		High	
		N	%	N	%	N	%
Integration of ICT in Teaching and Learning Process	Rural	18	19.4	57	61.3	18	19.4
	Urban	214	16.9	89	71.8	14	11.3

It is inferred from the above table that 19.4% of rural and 16.9% of urban primary teachers have low, 61.3% of rural and 71.8% of urban students have moderate and 19.4% of rural and 11.3% of urban primary teachers have high level of Integration of ICT in Teaching and Learning Process.

4. Level of Integration of ICT in Teaching and Learning Process of Primary Teachers with respect to Type of School

Table 4.4

LEVEL OF INTEGRATION OF ICT IN TEACHING AND LEARNING PROCESS OF PRIMARY TEACHERS WITH RESPECT TO TYPE OF SCHOOL

Variable	Category	Low		Moderate		High	
		N	%	N	%	N	%
Integration of ICT in Teaching and Learning Process	Government	23	17.3	95	71.4	15	11.3
	Aided	7	14.6	31	64.6	10	20.8
	Private	9	25.0	20	55.6	7	19.4

It is inferred from the above table that 17.3% of government, 14.6% of aided and 25.0% of private school primary teachers have low, 71.4% of government, 64.6% of aided and 55.6% of private school primary teachers have moderate and 11.3% of government, 20.8% of aided and 19.4% of private school primary teachers have high level of Integration of ICT in Teaching and Learning Process.

5. To find out the Level of E-Readiness of Primary School Teachers.

Table 4.5

Level of E-Readiness of Primary School Teachers

E-Readiness	Low		Moderate		High	
	N	%	N	%	N	%
Psychological Readiness	36	16.6	148	68.2	33	15.2
Technological Readiness	26	12.0	165	76.0	26	12.0
Content Readiness	34	15.7	183	84.3	0	0.0
Equipment Readiness	41	18.9	143	65.9	33	15.2
Financial readiness	30	13.8	148	68.2	39	18.0
Human Resource Readiness	37	17.1	138	63.6	42	19.4
E-Readiness Total	36	16.6	149	68.7	32	14.7

It is inferred from the above table that 16.6% of primary teachers have low, 68.2% of them have moderate and 15.2% of them high level of Psychological Readiness.

12.0% of students have low, 76.0% of them have moderate and 12.0% of them high level of Technological Readiness.

15.7% of students have low, 84.3% of them have moderate and none of them have high level of Content Readiness.

18.9% of students have low, 65.9% of them have moderate and 15.2% of them have high level of Equipment Readiness.

13.8% of students have low, 68.2% of them have moderate and 18.0% of them have high level of Financial readiness.

17.1% of students have low, 63.6% of them have moderate and 19.4% of them have high level of Human Resource Readiness.

16.6% of students have low, 68.7% of them have moderate and 14.7% of them have high level of E-Readiness Total.

6. To find out the Level of E-Readiness of Primary School Teachers with regard to gender.

Table 4.6

Level of E-Readiness of Primary School Teachers with regard to Gender

E-Readiness	Gender	Low		Moderate		High	
		N	%	N	%	N	%
Psychological Readiness	Male	8	14.5	34	61.8	13	23.6
	Female	28	17.3	114	70.4	20	12.3
Technological Readiness	Male	9	16.4	40	72.7	6	10.9
	Female	17	10.5	125	77.2	20	12.3
Content Readiness	Male	12	21.8	23	78.2	0	0.0
	Female	22	13.6	140	86.4	0	0.0
Equipment Readiness	Male	8	14.5	33	60.0	14	25.5
	Female	33	20.4	110	67.9	19	11.7
Financial readiness	Male	8	14.5	32	582	15	27.3
	Female	22	13.6	116	71.6	24	14.8
Human Resource Readiness	Male	10	18.2	32	58.2	13	23.6
	Female	27	16.7	106	65.4	29	17.9
E-Readiness Total	Male	10	18.2	35	63.6	10	18.2
	Female	26	16.0	114	70.4	22	13.6

It is inferred from the above table that 14.5% of male 17.3% of female primary teachers have low, 61.8% of male 70.4% of female have moderate and 23.6% of male 12.3% of female high level of Psychological Readiness.

16.4% of male 10.5% of female primary teachers have low, 72.7% of male 77.2% of female have moderate and 10.9% of male 12.3% of female high level of Technological Readiness.

21.8% of male 13.6% of female primary teachers have low, 78.2% of male 86.4% of female have moderate and none of male none of female high level of Content Readiness.

14.5% of male 20.4% of female primary teachers have low, 60.0% of male 67.9% of female have moderate and 25.5% of male 11.7% of female high level of Equipment Readiness.

14.5% of male 13.6% of female primary teachers have low, 58.2% of male 71.6% of female have moderate and 27.3% of male 14.8% of female high level of Financial readiness.

18.2% of male 16.7% of female primary teachers have low, 58.2% of male 65.4% of female have moderate and 23.6% of male 17.9% of female high level of Human Resource Readiness.

18.2% of male 16.0% of female primary teachers have low, 63.6% of male 70.4% of female have moderate and 18.2% of male 13.6% of female high level of E-Readiness Total.

7. To find out the Level of E-Readiness of Primary School Teachers with regard to location of school.

Table 4.7

Level of E-Readiness of Primary School Teachers with regard to Location of School

E-Readiness	Location of School	Low		Moderate		High	
		N	%	N	%	N	%
Psychological Readiness	Rural	19	20.4	61	65.6	13	14.0
	Urban	17	13.7	87	70.2	20	16.1
Technological Readiness	Rural	7	7.5	77	82.8	9	9.7
	Urban	19	15.3	88	71.0	17	13.7
Content Readiness	Rural	13	14.0	80	86.0	0	0.0
	Urban	21	16.9	103	83.1	0	0.0
Equipment Readiness	Rural	14	15.1	66	71.0	13	14.0
	Urban	27	21.8	77	62.1	20	16.1
Financial readiness	Rural	11	11.8	67	72.0	15	16.1
	Urban	19	15.3	81	65.3	24	19.4
Human Resource Readiness	Rural	15	16.1	67	72.0	11	11.8
	Urban	22	17.7	71	57.3	31	25.0
E-Readiness Total	Rural	13	14.0	70	75.3	10	10.8
	Urban	23	18.5	79	63.7	22	17.7

It is inferred from the above table that 20.4% of rural 13.7% of urban primary teachers have low, 65.6% of rural 70.2% of urban have moderate and 14.0% of rural 16.1% of urban high level of Psychological Readiness.

7.5% of rural 15.3% of urban primary teachers have low, 82.8% of rural 71.0% of urban have moderate and 9.7% of rural 13.7% of urban high level of Technological Readiness.

14.0% of rural 16.9% of urban primary teachers have low, 86.0% of rural 83.1% of urban have moderate and none of rural none of urban high level of Content Readiness.

15.1% of rural 21.8% of urban primary teachers have low, 71.0% of rural 62.1% of urban have moderate and 14.0% of rural 16.1% of urban high level of Equipment Readiness.

11.8% of rural 15.3% of urban primary teachers have low, 72.0% of rural 65.3% of urban have moderate and 16.1% of rural 19.4% of urban high level of financial readiness.

16.1% of rural 17.7% of urban primary teachers have low, 72.0% of rural 57.3% of urban have moderate and 11.8% of rural 25.0% of urban high level of Human Resource Readiness.

14.0% of rural 18.5% of urban primary teachers have low, 75.3% of rural 63.7% of urban have moderate and 10.8% of rural 17.7% of urban high level of E-Readiness Total.

8. To find out the Level of E-Readiness of Primary School Teachers with regard to type of school.

Table 4.8

Level of E-Readiness of Primary School Teachers with regard to Type of School

E-Readiness	Category	Low		Moderate		High	
		N	%	N	%	N	%
Psychological Readiness	Government	23	17.3	96	72.2	14	10.5
	Aided	4	8.3	29	60.4	15	31.3
	Private	9	25.0	23	63.9	4	11.1
Technological Readiness	Government	13	9.8	109	82.0	11	8.3
	Aided	7	14.6	31	64.6	10	20.8
	Private	6	16.7	25	69.4	5	13.9
Content Readiness	Government	18	13.5	115	86.5	0	0.0
	Aided	10	20.8	38	79.2	0	0.0
	Private	6	16.7	30	83.3	0	0.0
Equipment Readiness	Government	25	18.8	94	70.7	14	10.5
	Aided	9	18.8	25	52.1	14	10.5
	Private	7	19.4	24	66.7	5	13.9
Financial readiness	Government	21	15.8	94	70.7	18	13.5
	Aided	5	10.4	30	62.5	13	27.1
	Private	4	11.1	24	66.7	8	22.2
	Government	22	16.5	88	66.2	23	17.3
	Aided	7	14.6	29	60.4	12	25.0

Human Resource Readiness	Private	37	17.1	138	63.6	42	19.4
E-Readiness Total	Government	20	15.0	100	75.2	13	9.8
	Aided	9	18.8	24	50.0	15	31.3
	Private	7	19.4	25	69.4	4	11.1

It is inferred from the above table that 17.3% of government, 8.3% of aided and 25.0% of private school primary teachers have low, 72.2% of government, 60.4% of aided and 63.9% of private school primary teachers have moderate and 10.5% of government, 31.3% of aided and 11.1% of private school primary teachers have high level of psychological readiness.

9.8% of government, 14.6% of aided and 16.7% of private school primary teachers have low, 82.0% of government, 64.6% of aided and 69.4% of private school primary teachers have moderate and 8.3% of government, 20.8% of aided and 13.9% of private school primary teachers have high level of technological readiness.

13.5% of government, 20.8% of aided and 16.7% of private school primary teachers have low, 86.5% of government, 79.2% of aided and 83.3% of private school primary teachers have moderate and none of government, none of aided and none of private school primary teachers have high level of content readiness.

18.8% of government, 18.8% of aided and 19.4% of private school primary teachers have low, 70.7% of government, 52.1% of aided and 66.7% of private school primary teachers have moderate and 10.5% of government, 29.2% of aided and 13.9% of private school primary teachers have high level of equipment readiness.

15.8% of government, 10.4% of aided and 11.1% of private school primary teachers have low, 70.7% of government, 62.5% of aided and 66.7% of private school primary teachers have moderate and 13.5% of government, 27.1% of aided and 22.2% of private school primary teachers have high level of financial readiness.

16.5% of government, 14.6% of aided and 22.2% of private school primary teachers have low, 66.2% of government, 60.4% of aided and 58.3% of private school primary teachers have moderate and 17.3% of government, 25.0% of aided and 19.4% of private school primary teachers have high level of human resource readiness.

15.0% of government, 18.8% of aided and 19.4% of private school primary teachers have low, 75.2% of government, 50.0% of aided and 69.4% of private school primary teachers have moderate and 9.8% of government, 31.3% of aided and 11.1% of private school primary teachers have high level of E-readiness total.

4.4 SIGNIFICANCE OF DIFFERENCE BETWEEN THE VARIABLES

H_o1: There is no significant difference between male and female primary teachers in their Integration of ICT in Teaching and Learning Process.

Table 4.9

Difference between male and female primary teachers in their Integration of ICT in Teaching and Learning Process

Variable	Gender	N	Mean	S.D.	Calculated 't' Value	'P' value	Remarks at 0.05 Level
Integration of ICT in Teaching and Learning Process	Male	55	166.40	17.216	1.356	0.414	NS
	Female	162	169.98	16.018			

It is inferred from the above table that there is no significant difference between male and female primary teachers in their Integration of ICT in Teaching and Learning Process.

H_o2: There is no significant difference between rural and urban school primary teachers in their Integration of ICT in Teaching and Learning Process.

Table 4.10

Difference between rural and urban school primary teachers in their Integration of ICT in Teaching and Learning Process

Variable	Location of School	N	Mean	S.D.	Calculated 't' Value	'P' value	Remarks at 0.05 Level
Integration of ICT in Teaching and Learning Process	Rural	93	169.46	18.267	0.294	0.088	**NS**
	Urban	124	168.78	14.847			

It is inferred from the above table that there is no significant difference between rural and urban school primary teachers in their Integration of ICT in Teaching and Learning Process.

H_o3: There is no significant difference between below 40 and above 40 age group primary teachers in their Integration of ICT in Teaching and Learning Process.

Table 4.11

Difference between below 40 and above 40 age group primary teachers in their Integration of ICT in Teaching and Learning Process

Variable	Age	N	Mean	S.D.	Calculated 't' Value	'P' value	Remarks at 0.05 Level
Integration of ICT in Teaching and Learning Process	Below 40	169	169.44	15.758	0.562	0.086	NS
	Above 40	48	167.79	18.463			

It is inferred from the above table that there is no significant difference between below 40 and above 40 age group primary teachers in their Integration of ICT in Teaching and Learning Process.

H_o4: There is no significant difference between primary and middle school primary teachers in their Integration of ICT in Teaching and Learning Process.

Table 4.12

Difference between primary and middle school primary teachers in their Integration of ICT in Teaching and Learning Process

Variable	Nature of School	N	Mean	S.D.	Calculated 't' Value	'P' value	Remarks at 0.05 Level
Integration of ICT in Teaching and Learning Process	Primary	185	169.90	15.827	1.590	0.486	NS
	Middle	32	164.31	18.749			

It is inferred from the above table that there is no significant difference between primary and middle school primary teachers in their Integration of ICT in Teaching and Learning Process.

H_o5: There is no significant difference between government and aided school primary teachers in their Integration of ICT in Teaching and Learning Process.

Table 4.13

Difference between government and aided school primary teachers in their Integration of ICT in Teaching and Learning Process

Variable	Type of School	N	Mean	S.D.	Calculated 't' Value	'P' value	Remarks at 0.05 Level
Integration of ICT in Teaching and Learning Process	Government	155	169.37	15.434	0.386	0.091	**NS**
	Aided	62	168.34	18.602			

It is inferred from the above table that there is no significant difference between government and aided school primary teachers in their Integration of ICT in Teaching and Learning Process.

H_o6: There is no significant difference between ICT training attended and not attended primary teachers in their Integration of ICT in Teaching and Learning Process.

Table 4.14

Difference between ICT training attended and not attended primary teachers in their Integration of ICT in Teaching and Learning Process

Variable	ICT Training Attended	N	Mean	S.D.	Calculated 't' Value	'P' value	Remarks at 0.05 Level
Integration of ICT in Teaching and Learning Process	Not Attended	182	169.99	15.816	1.700	0.300	NS
	Attended	35	164.31	18.485			

It is inferred from the above table that there is no significant difference between ICT training attended and not attended primary teachers in their Integration of ICT in Teaching and Learning Process.

H_o7: There is no significant difference between below 20 years and above 20 years of teaching experience of primary teachers in their Integration of ICT in Teaching and Learning Process.

Table 4.15

Difference between below 20 years and above 20 years of teaching experience of primary teachers in their Integration of ICT in Teaching and Learning Process

Variable	Years of Experience	N	Mean	S.D.	Calculated 't' Value	'P' value	Remarks at 0.05 Level
Integration of ICT in Teaching and Learning Process	Below 20	83	171.48	18.560	1.624	0.035	NS
	Above 20	134	167.58	14.719			

It is inferred from the above table that there is no significant difference between below 20 years and above 20 years of teaching experience of primary teachers in their Integration of ICT in Teaching and Learning Process.

H_o8: There is no significant difference between male and female primary teachers in their E-Readiness.

Table 4.16

Difference between Male and Female Primary Teachers in their E-Readiness

Dimensions	Gender	N	Mean	Std. Deviation	Calculated 't' Value	'P' value
Psychological Readiness	Male	55	44.73	5.311	0.846	0.425
	Female	162	44.04	4.978		
Technological Readiness	Male	55	44.75	4.675	0.441	0.591
	Female	162	45.07	4.717		
Content Readiness	Male	55	45.27	6.751	0.054	0.014
	Female	162	45.33	5.600		
Equipment Readiness	Male	55	52.67	6.183	0.932	0.767
	Female	162	51.77	6.392		
Financial Readiness	Male	55	49.71	6.514	0.402	0.194
	Female	162	49.33	4.634		
Human Resource Readiness	Male	55	58.29	7.096	0.949	0.467
	Female	162	57.26	6.564		
E-Readiness Total	Male	55	335.18	29.325	0.301	0.258
	Female	162	333.83	26.675		

It is inferred from the above table that there is no significant difference between male and female primary teachers in their Psychological Readiness, Technological Readiness, Content Readiness, Equipment Readiness, Financial Readiness, Human Resource Readiness and E-Readiness Total.

H_o9: There is no significant difference between rural and urban school primary teachers in their E-Readiness.

Table 4.17

Difference between Rural and Urban School Primary Teachers in their E-Readiness

Dimensions	Location of School	N	Mean	Std. Deviation	Calculated 't' Value	'P' Value
Psychological Readiness	Rural	93	43.43	5.230	1.964	0.604
	Urban	124	44.80	4.869		
Technological Readiness	Rural	93	45.04	4.356	0.157	0.051
	Urban	124	44.94	4.956		
Content Readiness	Rural	93	45.47	5.488	0.351	0.224
	Urban	124	45.19	6.205		
Equipment Readiness	Rural	93	52.17	5.847	0.362	0.096
	Urban	124	51.86	6.702		
Financial Readiness	Rural	93	48.96	4.667	1.182	0.210
	Urban	124	49.77	5.496		
Human Resource Readiness	Rural	93	57.38	5.689	0.285	0.031
	Urban	124	57.63	7.391		
E-Readiness Total	Rural	93	332.26	21.911	0.938	0.059
	Urban	124	335.61	30.749		

It is inferred from the above table that there is no significant difference between rural and urban school primary teachers in their Psychological Readiness, Technological Readiness, Content Readiness, Equipment Readiness, Financial Readiness, Human Resource Readiness and E-Readiness Total.

H_o10: There is no significant difference between below 40 and above 40 age group primary teachers in their E-Readiness.

Table 4.18

Difference between below 40 and above 40 age group Primary Teachers in their E-Readiness

Dimensions	Age	N	Mean	Std. Deviation	Calculated 't' Value	'P' Value
Psychological Readiness	Below 40	169	44.38	4.849	0.856	0.128
	Above 40	48	43.60	5.760		
Technological Readiness	Below 40	169	45.21	4.711	1.353	542
	Above 40	48	44.19	4.611		
Content Readiness	Below 40	169	45.43	5.747	0.521	0.262
	Above 40	48	44.90	6.442		
Equipment Readiness	Below 40	169	52.28	6.092	1.132	0.181
	Above 40	48	51.00	7.116		
Financial Readiness	Below 40	169	49.56	4.763	0.628	0.362
	Above 40	48	48.94	6.406		
Human Resource Readiness	Below 40	169	57.64	6.638	0.474	0.390
	Above 40	48	57.10	6.975		
E-Readiness Total	Below 40	169	334.54	25.795	0.329	0.151
	Above 40	48	332.88	32.349		

It is inferred from the above table that there is no significant difference between below 40 and above 40 age group primary teachers in their Psychological Readiness, Technological Readiness, Content Readiness, Equipment Readiness, Financial Readiness, Human Resource Readiness and E-Readiness Total.

H_o11: There is no significant difference between primary and middle school primary teachers in their E-Readiness.

Table 4.19

Difference between Primary and Middle School Primary Teachers in their E-Readiness

Dimensions	Nature of school	N	Mean	Std. Deviation	Calculated 't' Value	'P' Value
Psychological Readiness	Primary	185	44.47	4.949	1.683	0.175
	Middle	32	42.72	5.514		
Technological Readiness	Primary	185	44.85	4.907	1.341	0.042
	Middle	32	45.75	3.183		
Content Readiness	Primary	185	45.34	5.907	0.162	0.864
	Middle	32	45.16	5.930		
Equipment Readiness	Primary	185	51.91	6.426	0.487	0.560
	Middle	32	52.47	5.869		
Financial Readiness	Primary	185	49.62	5.070	1.229	0.489
	Middle	32	48.31	5.619		
Human Resource Readiness	Primary	185	57.50	6.673	0.120	0.418
	Middle	32	57.66	6.973		
E-Readiness Total	Primary	185	334.46	27.706	0.393	0.953
	Middle	32	332.53	25.227		

It is inferred from the above table that there is no significant difference between primary and middle school primary teachers in their Psychological Readiness, Technological Readiness, Content Readiness, Equipment Readiness, Financial Readiness, Human Resource Readiness and E-Readiness Total.

H_o12: There is no significant difference between government and aided school primary teachers in their E-Readiness.

Table 4.20

Difference between Government and Aided School Primary Teachers in their E-Readiness

Dimensions	Type of school	N	Mean	Std. Deviation	Calculated 't' Value	'P' Value
Psychological Readiness	Government	155	44.21	4.698	0.023	0.074
	Aided	62	44.23	5.913		
Technological Readiness	Government	155	45.34	4.225	1.539	0.018
	Aided	62	44.11	5.657		
Content Readiness	Government	155	45.17	5.692	0.546	0.571
	Aided	62	45.68	6.414		
Equipment Readiness	Government	155	52.27	6.083	0.957	0.085
	Aided	62	51.31	6.937		
Financial Readiness	Government	155	49.32	5.375	0.487	0.531
	Aided	62	49.68	4.616		
Human Resource Readiness	Government	155	57.88	5.957	1.082	0.002
	Aided	62	56.63	8.265		
E-Readiness Total	Government	155	334.75	23.533	0.418	0.002
	Aided	62	332.73	35.203		

It is inferred from the above table that there is no significant difference between government and aided school primary teachers in their Psychological Readiness, Technological Readiness, Content Readiness, Equipment Readiness, Financial Readiness, Human Resource Readiness and E-Readiness Total.

H_o13: There is no significant difference between ICT training attended and not attended primary teachers in their E-Readiness.

Table 4.21
Difference between ICT training attended and not attended Primary Teachers in their E-Readiness

Dimensions	ICT Training attended	N	Mean	Std. Deviation	Calculated 't' Value	'P' Value
Psychological Readiness	Not Attended	182	44.42	4.953	1.302	0.136
	Attended	35	43.11	5.535		
Technological Readiness	Not Attended	182	44.90	4.837	0.699	0.563
	Attended	35	45.43	3.928		
Content Readiness	Not Attended	182	45.64	5.498	1.506	0.002
	Attended	35	43.63	7.515		
Equipment Readiness	Not Attended	182	52.38	6.070	1.799	0.181
	Attended	35	50.00	7.356		
Financial Readiness	Not Attended	182	49.51	5.088	0.531	0.596
	Attended	35	48.97	5.586		
Human Resource Readiness	Not Attended	182	57.57	6.778	0.236	0.927
	Attended	35	57.29	6.378		
E-Readiness Total	Not Attended	182	335.17	27.039	1.182	0.416
	Attended	35	329.00	28.504		

It is inferred from the above table that there is no significant difference between ICT training attended and not attended primary teachers in their Psychological Readiness, Technological Readiness, Content Readiness, Equipment Readiness, Financial Readiness, Human Resource Readiness and E-Readiness Total.

H_o14: There is no significant difference between below 20 and above 20 years of experience primary teachers in their E-Readiness.

Table 4.22

Difference between below 20 and above 20 years of experience Primary Teachers in their E-Readiness

Dimensions	Years of Experience	N	Mean	Std. Deviation	Calculated 't' Value	'P' Value
Psychological Readiness	Rural	83	43.75	5.224	1.052	0.722
	Urban	134	44.50	4.955		
Technological Readiness	Rural	83	45.28	3.677	0.777	0.018
	Urban	134	44.81	5.236		
Content Readiness	Rural	83	45.59	5.818	0.547	0.778
	Urban	134	45.14	5.960		
Equipment Readiness	Rural	83	51.83	6.473	0.297	0.821
	Urban	134	52.10	6.274		
Financial Readiness	Rural	83	49.59	4.486	0.392	0.239
	Urban	134	49.32	5.553		
Human Resource Readiness	Rural	83	57.46	6.348	0.111	0.644
	Urban	134	57.56	6.934		
E-Readiness Total	Rural	83	334.06	23.643	0.051	0.353
	Urban	134	334.25	29.434		

It is inferred from the above table that there is no significant difference between below 20 and above 20 years of experience primary teachers in their Psychological Readiness, Technological Readiness, Content Readiness, Equipment Readiness, Financial Readiness, Human Resource Readiness and E-Readiness Total.

H_o15: There is no significant association between UG, PG and M.Phil/Ph.D qualified primary teachers in their E-Readiness.

Table 4.23

Significant Association between UG, PG and M.Phil/P.h.D qualified Primary Teachers in their E-Readiness

Dimensions	Educational Qualification	Low	Moderate	High	Calculated 'χ^2' value	Remarks
Psychological Readiness	UG	9	40	5	2.447	NS
	PG	22	82	22		
	M.Phil / Ph.D.,	5	26	6		
Technological Readiness	UG	4	44	6	2.381	NS
	PG	17	92	17		
	M.Phil / Ph.D.,	5	29	3		
Content Readiness	UG	12	42	54	2.598	NS
	PG	18	108	126		
	M.Phil / Ph.D.,	4	33	37		
Equipment Readiness	UG	12	36	6	4.335	NS
	PG	25	83	18		
	M.Phil / Ph.D.,	4	24	9		
Financial Readiness	UG	6	43	5	6.414	NS
	PG	20	78	28		
	M.Phil / Ph.D.,	4	27	6		
Human Resource Readiness	UG	6	40	8	12.769	S
	PG	24	82	20		
	M.Phil / Ph.D.,	7	16	14		
E-Readiness Total	UG	7	39	8	1.802	NS
	PG	24	85	17		
	M.Phil / Ph.D.,	5	25	7		

(At 5% level of significance for the table value is 9.488)

The above the table shows that the calculated 'χ^{2}' value (2.447, 2.381, 2.598, 4.335 and 6.414) is lesser than the table value (9.488) at 5% level of significance. Hence the Null Hypothesis is accepted. It is concluded that there is no significance association in their psychological readiness, Technological Readiness, Content Readiness, Equipment Readiness, Financial Readiness and E-Readiness Total of primary teachers with respect to educational qualification. But the calculated 'χ^{2}' value (12.769) is greater than the table value (9.488) at 5% level of significance. Hence the Null Hypothesis is rejected. So there is a significance association in their Human Resource Readiness with respect to educational qualification.

H_o16: There is no significant association between UG, PG and M.Phil/Ph.D qualified primary teachers in their Integration of ICT in Teaching Learning Process.

Table 4.24

Significant Association between UG, PG and M.Phil/P.h.D qualified Primary Teachers in their Integration of ICT in Teaching Learning Process

Educational Qualification	Low	Moderate	High	Calculated 'χ^2' value	Remarks
UG	11	33	10	5.858	NS
PG	23	90	13		
M.Phil / Ph.D.,	5	23	9		

The above the table shows that the calculated 'χ^2' value (5.858) is lesser than the table value (9.488) at 5% level of significance. Hence the Null Hypothesis is accepted. It is concluded that there is no significance association in their Integration of ICT in Teaching Learning Process an educational qualification.

H_o17: There is no significant relationship between E-Readiness and Integration of ICT in Teaching and Learning Process among primary teachers.

Table 4.25

Significant Relationship between E-Readiness and Integration of ICT in Teaching and Learning Process among Primary Teachers

E-Readiness and Integration of ICT in Teaching and Learning Process among Primary Teachers	N	Calculated 'γ' value	Remarks
	217	0.377	S

The above the table shows that the calculated correlation value (0.377) is greater than the table value (0.138) at 5% level of significance. Hence the Null Hypothesis is rejected. It is concluded that there is a significant correlation between E-Readiness and Integration of ICT in Teaching and Learning Process among primary teachers.

CHAPTER-V

FINDINGS AND CONCLUSIONS

5.1 INTRODUCTION

The most important of any research is findings and conclusion the aim of present study is the e-readiness among primary teachers and their integration of ICT in their teaching learning process hence the topics for in *e* – readiness' among primary teachers to integrate ict in teaching and learning process. This chapter is a summary of the research work, including the statement of the problem, objectives of the study, hypothesis of the study findings and conclusion of the study and suggestions and recommendations.

5.2 TITLE OF THE PROBLEM

The title of the problem is stated as, **"***e* – READINESS' AMONG PRIMARY TEACHERS TO INTEGRATE ICT IN TEACHING AND LEARNING PROCESS".

5.3 OBJECTIVES OF THE STUDY

The objectives of the study are as follows;

6. To find out the level of e-Readiness of Primary Teachers.
7. To find out the level of Integration of ICT in Teaching and Learning Process of Primary Teachers.
8. To find out the level of e-Readiness of primary teachers with regard to gender, location of school and type of school.
9. To find out the level of Integration of ICT in Teaching and Learning Process of primary teachers with regard to gender, location of school and type of school.
10. To find out the significant difference if any between primary teachers in terms of gender, location of school, undergoing ICT training in their e-Readiness of Primary Teachers.

4. To find out the significant difference if any between primary teachers in terms of gender, location of school, undergoing ICT training in their Integration of ICT in Teaching and Learning Process.

6. To find out the significant difference if any among primary teachers in terms of age, type of school, nature of school and years of experience in their e-Readiness of Primary Teachers.

5. To find out the significant difference if any among primary teachers in terms of age, type of school, nature of school and years of experience in their Integration of ICT in Teaching and Learning Process.

6. To find out the significant association between primary teachers in terms of educational qualification in their e-Readiness.

7. To find out the significant association between primary teachers in terms of educational qualification in their Integration of ICT in Teaching and Learning Process.

8. To find out the significant correlation between primary teachers in their e-Readiness and Integration of ICT in Teaching and Learning Process.

5.4 HYPOTHESES OF THE STUDY

The hypotheses of the study are as follows;

H_o1: There is no significant difference between male and female primary teachers in their E-Readiness and its dimensions.

H_o2: There is no significant difference between primary teachers from rural and urban schools in their E-Readiness and its dimensions.

H_o3: There is no significant difference between primary teachers from ICT training attended and ICT training not attended in their E-Readiness and its dimensions.

H_o4: There is no significant difference between male and female primary teachers in their Integration of ICT in Teaching and Learning Process.

H_o5: There is no significant difference between primary teachers from rural and urban schools in their Integration of ICT in Teaching and Learning Process.

H_o6: There is no significant difference between primary teachers those who attended and not attended ICT service training in their Integration of ICT in Teaching and Learning Process.

H_o7: There is no significant difference among high school teachers from government, aided and matriculation schools in their E-Readiness and its dimensions.

H_o8: There is no significant difference among high school teachers from boys, girls and co-education schools in their E-Readiness and its dimensions.

H_o9: There is no significant difference among high school teachers having below 10 years, 10-20 years and 21 and above years of teaching experience in their E-Readiness and its dimensions.

H_o10: There is no significant difference among high school teachers having below 25 years, 26-35 years and 36 and above years of age in their E-Readiness and its dimensions.

H_o11: There is no significant difference among high school teachers from government, aided and matriculation schools in their Integration of ICT in Teaching and Learning Process.

H_o12: There is no significant difference among high school teachers from boys, girls and co-education schools in their Integration of ICT in Teaching and Learning Process.

H_o13: There is no significant difference among high school teachers having below 10 years, 10-20 years and 21 and above years of teaching experience in their Integration of ICT in Teaching and Learning Process.

H_o14: There is no significant difference among high school teachers having below 25 years, 26-35 years and 36 and above years of age in their Integration of ICT in Teaching and Learning Process.

H_o15: There is no significant association between primary teachers in terms of educational qualification in their e-Readiness.

H_o16: There is no significant association between primary teachers in terms of educational qualification in their Integration of ICT in Teaching and Learning Process.

H_o17: There is no significant correlation between primary teachers in their e-Readiness and Integration of ICT in Teaching and Learning Process.

5.5 FINDINGS OF THE PRESENT STUDY

5.5.1 Results based on Percentage Analysis

Among the sample, 18.0% of primary teachers have low, 67.3% of them have moderate and 14.7% of them high level of Integration of ICT in Teaching and Learning Process.

Among the sample, 25.5% of male and 15.4% of female primary teachers have low, 63.6% of male and 68.5% of female students have moderate and 10.9% of male and 16.0% of female primary teachers have high level of Integration of ICT in Teaching and Learning Process.

Among the sample, 19.4% of rural and 16.9% of urban primary teachers have low, 61.3% of rural and 71.8% of urban students have moderate and 19.4% of rural and 11.3% of urban primary teachers have high level of Integration of ICT in Teaching and Learning Process.

Among the sample, 17.3% of government, 14.6% of aided and 25.0% of private school primary teachers have low, 71.4% of government, 64.6% of aided and 55.6% of private school primary teachers have moderate and 11.3% of government, 20.8% of aided and 19.4% of private school primary teachers have high level of Integration of ICT in Teaching and Learning Process.

Among the sample, 16.6% of primary teachers have low, 68.2% of them have moderate and 15.2% of them high level of Psychological Readiness. 12.0% of students

have low, 76.0% of them have moderate and 12.0% of them high level of Technological Readiness. 15.7% of students have low, 84.3% of them have moderate and none of them have high level of Content Readiness. 18.9% of students have low, 65.9% of them have moderate and 15.2% of them have high level of Equipment Readiness. 13.8% of students have low, 68.2% of them have moderate and 18.0% of them have high level of Financial readiness. 17.1% of students have low, 63.6% of them have moderate and 19.4% of them have high level of Human Resource Readiness. 16.6% of students have low, 68.7% of them have moderate and 14.7% of them have high level of E-Readiness Total.

Among the sample, 14.5% of male 17.3% of female primary teachers have low, 61.8% of male 70.4% of female have moderate and 23.6% of male 12.3% of female high level of Psychological Readiness. 16.4% of male 10.5% of female primary teachers have low, 72.7% of male 77.2% of female have moderate and 10.9% of male 12.3% of female high level of Technological Readiness. 21.8% of male 13.6% of female primary teachers have low, 78.2% of male 86.4% of female have moderate and none of male none of female high level of Content Readiness. 14.5% of male 20.4% of female primary teachers have low, 60.0% of male 67.9% of female have moderate and 25.5% of male 11.7% of female high level of Equipment Readiness. 14.5% of male 13.6% of female primary teachers have low, 58.2% of male 71.6% of female have moderate and 27.3% of male 14.8% of female high level of Financial readiness. 18.2% of male 16.7% of female primary teachers have low, 58.2% of male 65.4% of female have moderate and 23.6% of male 17.9% of female high level of Human Resource Readiness. 18.2% of male 16.0% of female primary teachers have low, 63.6% of male 70.4% of female have moderate and 18.2% of male 13.6% of female high level of E-Readiness Total.

Among the sample, 20.4% of rural 13.7% of urban primary teachers have low, 65.6% of rural 70.2% of urban have moderate and 14.0% of rural 16.1% of urban high level of Psychological Readiness. 7.5% of rural 15.3% of urban primary teachers have low,

82.8% of rural 71.0% of urban have moderate and 9.7% of rural 13.7% of urban high level of Technological Readiness. 14.0% of rural 16.9% of urban primary teachers have low, 86.0% of rural 83.1% of urban have moderate and none of rural none of urban high level of Content Readiness. 15.1% of rural 21.8% of urban primary teachers have low, 71.0% of rural 62.1% of urban have moderate and 14.0% of rural 16.1% of urban high level of Equipment Readiness. 11.8% of rural 15.3% of urban primary teachers have low, 72.0% of rural 65.3% of urban have moderate and 16.1% of rural 19.4% of urban high level of financial readiness. 16.1% of rural 17.7% of urban primary teachers have low, 72.0% of rural 57.3% of urban have moderate and 11.8% of rural 25.0% of urban high level of Human Resource Readiness. 14.0% of rural 18.5% of urban primary teachers have low, 75.3% of rural 63.7% of urban have moderate and 10.8% of rural 17.7% of urban high level of E-Readiness Total.

Among the sample, It is inferred from the above table that 17.3% of government, 8.3% of aided and 25.0% of private school primary teachers have low, 72.2% of government, 60.4% of aided and 63.9% of private school primary teachers have moderate and 10.5% of government, 31.3% of aided and 11.1% of private school primary teachers have high level of psychological readiness. 9.8% of government, 14.6% of aided and 16.7% of private school primary teachers have low, 82.0% of government, 64.6% of aided and 69.4% of private school primary teachers have moderate and 8.3% of government, 20.8% of aided and 13.9% of private school primary teachers have high level of technological readiness. 13.5% of government, 20.8% of aided and 16.7% of private school primary teachers have low, 86.5% of government, 79.2% of aided and 83.3% of private school primary teachers have moderate and none of government, none of aided and none of private school primary teachers have high level of content readiness. 18.8% of government, 18.8% of aided and 19.4% of private school primary teachers have low, 70.7% of government, 52.1% of aided and 66.7% of private school primary teachers have

moderate and 10.5% of government, 29.2% of aided and 13.9% of private school primary teachers have high level of equipment readiness. 15.8% of government, 10.4% of aided and 11.1% of private school primary teachers have low, 70.7% of government, 62.5% of aided and 66.7% of private school primary teachers have moderate and 13.5% of government, 27.1% of aided and 22.2% of private school primary teachers have high level of financial readiness. 16.5% of government, 14.6% of aided and 22.2% of private school primary teachers have low, 66.2% of government, 60.4% of aided and 58.3% of private school primary teachers have moderate and 17.3% of government, 25.0% of aided and 19.4% of private school primary teachers have high level of human resource readiness. 15.0% of government, 18.8% of aided and 19.4% of private school primary teachers have low, 75.2% of government, 50.0% of aided and 69.4% of private school primary teachers have moderate and 9.8% of government, 31.3% of aided and 11.1% of private school primary teachers have high level of E-readiness total.

5.5.2 Results based on Significance of Difference between the Variables

- There is no significant difference between male and female primary teachers in their Integration of ICT in Teaching and Learning Process.
- There is no significant difference between rural and urban school primary teachers in their Integration of ICT in Teaching and Learning Process.
- There is no significant difference between below 40 and above 40 age group primary teachers in their Integration of ICT in Teaching and Learning Process.
- There is no significant difference between primary and middle school primary teachers in their Integration of ICT in Teaching and Learning Process.
- There is no significant difference between government and aided school primary teachers in their Integration of ICT in Teaching and Learning Process.

- There is no significant difference between ICT training attended and not attended primary teachers in their Integration of ICT in Teaching and Learning Process.
- There is no significant difference between below 20 years and above 20 years of teaching experience of primary teachers in their Integration of ICT in Teaching and Learning Process.
- There is no significant difference between male and female primary teachers in their Psychological Readiness, Technological Readiness, Content Readiness, Equipment Readiness, Financial Readiness, Human Resource Readiness and E-Readiness Total.
- There is no significant difference between rural and urban school primary teachers in their Psychological Readiness, Technological Readiness, Content Readiness, Equipment Readiness, Financial Readiness, Human Resource Readiness and E-Readiness Total.
- There is no significant difference between below 40 and above 40 age group primary teachers in their Psychological Readiness, Technological Readiness, Content Readiness, Equipment Readiness, Financial Readiness, Human Resource Readiness and E-Readiness Total.
- There is no significant difference between primary and middle school primary teachers in their Psychological Readiness, Technological Readiness, Content Readiness, Equipment Readiness, Financial Readiness, Human Resource Readiness and E-Readiness Total.
- There is no significant difference between government and aided school primary teachers in their Psychological Readiness, Technological Readiness, Content Readiness, Equipment Readiness, Financial Readiness, Human Resource Readiness and E-Readiness Total.

- There is no significant difference between ICT training attended and not attended primary teachers in their Psychological Readiness, Technological Readiness, Content Readiness, Equipment Readiness, Financial Readiness, Human Resource Readiness and E-Readiness Total.
- There is no significant difference between below 20 and above 20 years of experience primary teachers in their Psychological Readiness, Technological Readiness, Content Readiness, Equipment Readiness, Financial Readiness, Human Resource Readiness and E-Readiness Total.
- There is no significance association in their psychological readiness, Technological Readiness, Content Readiness, Equipment Readiness, Financial Readiness and E-Readiness Total of primary teachers with respect to educational qualification. But there is a significance association in their Human Resource Readiness with respect to educational qualification.
- There is no significance association in their E-Readiness an educational qualification.
- There is a significant correlation between E-Readiness and Integration of ICT in Teaching and Learning Process among primary teachers.

5.6 EDUCATIONAL IMPLICATIONS

The percentage analysis of the integration of ICT in the teaching and learning process among primary teachers provides several educational implications. Firstly, the data indicates that the majority of primary teachers (67.3%) exhibit a moderate level of ICT integration, while a smaller proportion demonstrate either low (18.0%) or high (14.7%) levels. This suggests a general proficiency in ICT use but also highlights areas for improvement to elevate more teachers to a higher proficiency level. Gender-wise, male teachers (25.5%) are more likely than female teachers (15.4%) to have a low level of ICT

integration, implying a need for targeted support to enhance male teachers' ICT skills. However, a higher percentage of female teachers (16.0%) than male teachers (10.9%) are at a high level, indicating that interventions to boost ICT integration may need to consider gender-specific approaches.

The rural-urban divide shows that urban teachers (71.8%) are more likely than rural teachers (61.3%) to have a moderate level of ICT integration. Rural teachers have a slightly higher proportion (19.4%) at a high level compared to urban teachers (11.3%), suggesting that while rural teachers may have more ICT champions, a significant number still require support to reach moderate proficiency. Comparatively, teachers in private schools have the highest percentage (25.0%) at a low level of ICT integration, highlighting a potential gap in ICT resources or training in private institutions. Meanwhile, government and aided schools exhibit higher percentages of teachers at a moderate level (71.4% and 64.6%, respectively), suggesting more consistent ICT integration efforts in these settings.

Regarding psychological readiness, 68.2% of primary teachers show moderate readiness, essential for effective ICT integration. However, 16.6% have low psychological readiness, indicating a need for professional development to build confidence and skills in using ICT. Interestingly, a majority of students (76.0%) display moderate technological readiness, but a significant portion (12.0%) still shows low readiness, suggesting a need for further ICT training and resource provision for students.

The analysis reveals no significant differences in ICT integration across gender, rural-urban settings, age groups, school levels, government and aided schools, ICT training attendance, and teaching experience. This uniformity suggests that ICT integration efforts are broadly equitable but highlights the need for tailored interventions to address the unique needs of different teacher demographics.

Overall, the findings underscore the importance of continuous professional development, targeted support for specific teacher groups, and enhanced ICT

infrastructure and resources, particularly in private and rural schools. Emphasizing psychological readiness and addressing the technological readiness of both teachers and students will be crucial in advancing the integration of ICT in the teaching and learning process.

5.7 RECOMMENDATIONS OF THE STUDY

Based on the analysis and findings of the study, the following recommendations are made:

1. **Enhanced Professional Development**:
    - Conduct regular ICT training and workshops for teachers to improve their ICT skills and integration in the teaching-learning process.
    - Provide targeted support and mentoring for teachers with low ICT integration levels, particularly male teachers.
2. **Improved Infrastructure and Resources**:
    - Invest in upgrading ICT infrastructure in schools, with a particular focus on rural and private schools to bridge the ICT integration gap.
    - Ensure reliable internet connectivity and access to modern digital tools for both teachers and students.
3. **Support for Psychological Readiness**:
    - Implement programs that build teachers' confidence and psychological readiness to integrate ICT into their teaching practices.
    - Foster a supportive school culture that encourages experimentation and innovation with ICT tools.
4. **Equity in ICT Access**:
    - Ensure equitable access to ICT resources for all students, with particular attention to those from disadvantaged backgrounds.

- Develop policies to support inclusive ICT integration, ensuring no student or teacher is left behind.

5. **Curriculum Integration**:
    - Integrate ICT more deeply into the curriculum to enhance learning outcomes across all subjects.
    - Use ICT tools for formative and summative assessments to provide immediate feedback and improve learning.
6. **Continuous Monitoring and Evaluation**:
    - Establish regular monitoring and evaluation mechanisms to assess the impact of ICT integration on teaching and learning.
    - Use data analytics to inform decisions and strategies for improving ICT integration.
7. **Community and Parental Engagement**:
    - Engage parents and the community in supporting ICT initiatives in schools.
    - Promote awareness about the benefits of ICT in education among stakeholders to garner broader support.
8. **Customized Interventions**:
    - Design customized interventions to address the unique needs of different teacher demographics, such as gender-specific support programs.
    - Provide additional resources and training for teachers in government and aided schools to maintain high levels of ICT integration.
9. **Support for Technological Readiness**:
    - Enhance students' technological readiness through dedicated ICT courses and hands-on training sessions.

- Provide students with access to digital devices and tools to practice and develop their ICT skills.

10. **Foster Collaborative Learning**:
    - Encourage peer collaboration and sharing of best practices among teachers to promote the effective use of ICT.
    - Create platforms for teachers to collaborate on ICT projects and share innovative teaching methods.

Implementing these recommendations will help improve the integration of ICT in the teaching-learning process, ultimately enhancing educational outcomes for both teachers and students.

5.8 SUGGESTIONS FOR FURTHER STUDY

The suggestions of the studies are as follows

- The effectiveness of using ICT to teach slow, average and gifted learners may be studied.
- Studies may be undertaken to see how learning time saved in ICT assisted instruction method in comparison with other conventional method.
- Investigate how different levels of ICT integration affect student academic performance and engagement across various subjects.
- Conduct a detailed study on the gender differences in attitudes towards ICT use, and how these differences impact teaching effectiveness and student outcomes.
- Explore the specific challenges and opportunities of ICT integration in rural schools compared to urban schools, and develop strategies to address the unique needs of each setting.
- Evaluate the effectiveness of various professional development programs aimed at enhancing teachers' ICT skills and integration, identifying best practices and areas for improvement.

5.9 CONCLUSION

The integration of ICT in the teaching-learning process presents both challenges and opportunities. The findings of the study reveal that while a majority of primary teachers exhibit moderate levels of ICT integration, there are significant disparities across gender, geographical locations, and types of schools. Enhanced professional development, improved infrastructure, and targeted support are crucial for elevating ICT proficiency among teachers. Emphasizing psychological readiness, ensuring equity in ICT access, and integrating ICT deeply into the curriculum can drive more effective use of technology in education. Continuous monitoring and evaluation, community engagement, and fostering collaborative learning environments are also essential for sustaining ICT integration efforts. By addressing these areas, educational institutions can create a more inclusive, innovative, and effective teaching-learning ecosystem that leverages the full potential of ICT to enhance educational outcomes for both teachers and students.

BIBLIOGRAPHY

Adams, D., Chuah, K. M., Sumintono, B., & Mohamed, A. (2021). Students' readiness for e-learning during the COVID-19 pandemic in a South-East Asian University: a Rasch analysis. *Asian Education and Development Studies, 11*(2), 324-339.

Aghaei, H. & Jangaiah (2015). *Effect of using information and communication technology in improving continuing medical education in Iran.* Published dissertation for the degree of doctor of philosophy, Mysore University, Retrieved from http://hdl.handle.net/10603/38472

Ajit & Magesan,. (2013). *A study on impact of information communication technology on the employees of banks in Virudhunagar district.* Published dissertation for the degree of doctor of philosophy in commerce, Madurai Kamarajar University. Retrieved from http://hdl.handle.net/10603/132675

Akaslan, D., & Law, E. L. (2011). Measuring teachers' readiness for e-learning in higher education institutions associated with the subject of electricity in Turkey. In 2011 *IEEE Global Engineering Education Conference (EDUCON)*, 481-490. IEEE. https://ieeexplore.ieee.org/ abstract/ document/5773180.

Akay & Turkey (2017). Comprehensive analysis on techno-pedagogical education competency and technology perception of pre-service teachers: relation, levels and views. *Contemporary Educational Technology, 8*(3), 232-248, Presented at the 2nd International Eurasian Educational Research Congress in Ankara (Turkey).

Alaattin, P. (2015). E-Learning Readiness in Medicine: Turkish Family Medicine (FM) Physicians Case. *The Online Journal of Distance Education and e-Learning, 3*(3), 21-25.

Al-araibi, A. A. M., Mahrin, M. N. R. B., & Yusoff, R. C. M. (2019). Technological aspect factors of E-learning readiness in higher education institutions: Delphi technique. *Education and Information Technologies, 24*(1), 567-590.

Aldiab, A., Chowdhury, H., Kootsookos, A., & Alam, F. (2017). Prospect of ELearning in Higher Education Sectors of Saudi Arabia: A Review. *Energy Procedia*. 110. 574-580. DOI: 10.1016/j.egypro.2017.03.187.

Alem, F., Plaisent, M., Zuccaro, C., & Bernard, P. (2016). Measuring e-learning readiness concept: scale development and validation using structural equation modeling. *International Journal of e-Education, e-Business, e-Management and e-Learning, 6*(4), 193-207.

Alghamdi, I. A., Goodwin, R., & Rampersad, G. (2011). E-government readiness assessment for government organizations in developing countries. *Computer and Information Science, 4*(3), 3-17.

Aparicio, M., Bacao, F., & Oliveira, T. (2016). An e-Learning Theoretical Framework. *Educati*onal Technology & Society, 19(1), 292–307.

Asabere, N. Y., & Enguah, S. E. (2012). Development of an information & communication technology (ict) business model for electronic learning (Elearning). *International journal of engineering science & advanced technology, 2*(5), 1178-1191.

Asogwa, U. D., Nkanu, C. U., & Sabo, A. (2022). Assessment of e-Learning Readiness of Lecturers and Students in Federal Colleges of Education in Northeast, Nigeria. *International Journal of Curriculum and Instruction, 14*(1), 455-472.

Aydin, C., & Tasci, D. (2005). Measuring Readiness For E-Learning: Reflections From An emerging Country. *Educational Technology & Society, 8*(4), 244-257.

Ayele, A. A., & Birhanie, W.K. (2020). E-Learning Readiness of Technology Institutes in Ethiopian Public Universities: From the Teachers' Perspective. In Habtu, N., Ayele, D., Fanta, S., Admasu, B., Bitew, M. (eds), Advances of Science and Technology. ICAST 2019. *Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering* (480-491). Springer Cham. https://doi.org/10.1007/978-3-030-43690-2_34.

Badri, M. A., Mohaidat, J., & Rashedi, A. A. (2013). Technology Readiness of School Teachers - An Empirical Study of Measurement and Segmentation. *Industrial Engineering & Management, 2*(4), 1-10. DOI: 10.4172/2169-0316.1000117.

Beaudry, A., & Pinsonneault, A. (2005), Understanding Usear Responses to Information Technology: A Coping Model of User Adapatation, *MIS Quarterly 29*(3), 493-524.

BECTA (2004). *What the Research Says about ICT and Reducing Teachers*. Retrieved from www.becta.org.uk/research on 24-05-2012.

Best, J. W., and Khan, J.V. (1999). Research in Education, (Seventh ed.) New Delhi:

Bhatti, R. & Hanif, M. (2013). Impact of ICT on Social Science Faculty Members' Information Usage Pattern at Bahauddin Zakariya University, Multan. Library *Philosophy & Practice*, 1-13. https://link.gale.com/ apps/doc/A341131979/AONE?u=anon~a315f681&sid=googleScholar&xid=8daa 5 d67.

Bhatti, R., Ahmad, M. N., & Khan, S.A. (2014). Trends towards internet usage among college teachers of Lodhran district, South Punjab, Pakistan. Library *Philosophy and Practice (e-journal).* 1-16. https://core.ac.uk/download/pdf/188090388.pdf.

Borotis, S., & Poulymenakou, A. (2004). E-Learning Readiness Components: Key Issues to Consider Before Adopting e-Learning Interventions. Paper presented at the *World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education Washington*, DC, USA. http://www.editlib.org/p/11555.

Borwankar, P.V. (1995). *Research Methodology*, New Delhi: Seth Publisher.

Bovermann, K., Weidlich, J., & Bastiaens, T. (2018). Online learning readiness and attitudes towards gaming in gamified online learning–a mixed methods case study. *International Journal of Educational Technology in Higher Education, 15*(1), 1-17.

Bowles, M. S. (2004). *Relearning to e-learn: Strategies for electronic learning and knowledge*. Academic Monographs.

Budhiraja, R., & Sachdeva, S. (2002). *E-readiness assessment (India).* http://unpan1.un.org/intradoc/groups/public/documents/ APCITY /UNPAN014673.pdf.

Budur, T., Demir, A., & Cura, F. (2021). University readiness to online education during Covid-19 pandemic. *International Journal of Social Sciences & Educational Studies, 8*(1), 180-200

Cabrera-Lozoya, A., Cerdan, F., Cano, M. D., Garcia-Sanchez, D., & Lujan, S. (2012). Unifying heterogeneous e-learning modalities in a single platform: CADI, a case study. *Computers & Education, 58*(1), 617-630.

Callo, E., & Yazon, A. (2020). Exploring the factors influencing the readiness of faculty and students on online teaching and learning as an alternative delivery mode for the new normal. *Universal Journal of Educational Research, 8*(8), 3509-3318.

Clark, K., & Kalin, S. (1996). Technostressed out? How to cope in the digital age. *Library Journal, 121*(13), 30- 32

Coskun, O., Ozeke, V., Budakoglu, I., & Kula, S. (2018). E-Learning Readiness of Turkish Medical Students: A Sample from Gazi University. *Gazi Medical Journal. 29*(4). 340-345.

Daniel, J.S. (1997). Why universities need technology strategies. *Change, 29*(4), 11-17.

Darab, B., & Montazer, G. (2011). An eclectic Model For Assessing E-learning Readiness in The Iranian Universities. *Computers & Education, 56*(3), 900-910.

Demir, O., & Yurdugul, H. (2015). The Exploration of Models Regarding E-learning Readiness: Reference Model Suggestions. *International Journal of Progressive Education, 11*(1), 173-194.

Dilip, R., & Devika, R. (2020). The role of technology on employee behavior and their performance of school teachers. *MuktShabd Journal, IX*(VI), 6841-6853.

Dogra, P., & Kaushal, A. (2022). Underlying the triple burden effects on women educationists due to COVID-19. *Education and Information Technologies, 27* (1), 209-228. DOI: 10.1007/s10639-021-10645-6.

Duygu, M. (2020). Analysis of the attitudes and the readiness of maker teachers towards e-learning, with use of several variables. *International Online Journal of Education and Teaching, 7*(2), 684-710.

Efe, R. (2011). Science Student Teachers & Educational Technology: Experience, Intentions & Value. *Educational Technology & Society, 14*(1), 228-240.

Eltayeb, G. E. A. (2020). The reality of using e-learning applications and E-readiness of faculty members: A case study. *International Journal of Advanced Research in computer science, 11*(3), 37-41.

Engelbrecht, E. (2003). A look at e-learning models: investigating their value for developing an e-learning strategy. *Progressio, 25*(2), 38-47.

Engholm, P., & McLean, J. (2001). What Determines An organisation's Readiness For e-learning? http://www.x-konsult.se/academia/ Thesis%20FINAL.htm.

Eslaminejad, T., Masood, M., & Ngah, N. A. (2010). Assessment of instructors' readiness for implementing e-learning in continuing medical education in Iran. *Medical teacher, 32*(10), e407-e412.

Ezinwa, N.W. (2020). E-learning readiness of universities in Nigeria- what are the opinions of the academic staff of Nigeria's premier university?. *Education and Information Technologies. 25*(2).1343-1370.

Farazkish, M. & Montazer, G. (2020). Assessing E-learning Readiness of Human Resources in Iranian Universities. *ORMR, 9*(4), 139-164. http://ormr. modares.ac.ir/article-28-23877-en.html.

Ferdousi, B. J. (2009). A Study of Factors that Affect Instructors' Intention to Use ELearning Systems in Two-Year Colleges [unpublished PhD Thesis]. USA: Nova Southeastern University.

Fuad, A. A. T., Ahmad, T.B.T., Nordin, M. S., Mohammed, A.M. D. & Ali, E.S. (2016). Underlying Structure of E-learning Readiness among Palestinian Secondary School Teachers in MATEC Web of Conferences 56, https://www.matec-onferences.org/articles/matecconf/pdf/2016/19/matecconf_ iccae2016_01011.pdf.

Fudail, M. & Mellar, H. (2008). Investigating Teacher Stress When Using Technology. *Computers & Education, 51*(3), 1103-1110.

Ghavifekr, S., & Rosdy, W.A.W. (2015). Teaching and learning with technology: Effectiveness of ICT integration in schools. *International Journal of Research in Education and Science, 1*(2), 175-191.

Good, C.V. (1959), *Dictionary of Education* (2nd Edition), New York: McGraw Hill & Co.

Gopal, B. V. (2015). *Influence of teaching attitude and anxiety towards utilization of information and communication technologies in classroom instruction among teacher educators at colleges of education*. Published dissertation for the degree of doctor of philosophy, Bharathidasan University, Retrieved from http://hdl. handle. net/ 1060 3 40286

Guglielmino, L. M., & Guglielmino, P. J. (2003). Identifying learners who are ready for e-learning and supporting their success. *Preparing learners for e-learning,* 18- 33. https://books.google. co.in/books?hl=en&lr= &id=3A9GJd2lkFIC&oi=fnd&pg=PA19&dq

Harper, S. (2000). Managing technostress in UK libraries: A realistic guide. Ariadne, 25, 18-21. http://www.ariadne. ac.uk/

Hashim, H., & Tasir, Z. (2014, April). E-learning readiness: A literature review. In 2014 *International Conference on Teaching and Learning in Computing and Engineering* (pp. 267-271). IEEE. https://ieeexplore.ieee.org/abstract/document/6821868

Hosny, S., Ghaly, M., Hmoud Al Sheikh, M., Shehata, M. H., Salem, A. H., Atwa, H. (2021). Developing, Validating, and Implementing a Tool for Measuring the Readiness of Medical Teachers for Online Teaching Post-COVID-19: A Multicenter Study. Adv Med EducPract, 12, 755-768. DOI: https://doi.org/ 10.2147/AMEP.S317029.

Howard, S. K. (2013). Risk-aversion: Understanding teachers' resistance to technology integration. *Technology, pedagogy and Education, 22*(3), 357-372

Hung, M. L. (2016). Teacher readiness for online learning: Scale development and teacher perceptions. *Computers & Education, 94*, 120-133. DOI: https://doi.org/10.1016/j.compedu.2015.11.012

Ilechukwu, L.C., & Njoku, C.C. (2014). Optimizing E-Learning in Nigerian Universities for Sustainable Development. *Journal of Information Engineering and Applications, 4*(10), 16-23.

Ilic, U. (2022). The Impact of ICT Instruction on Online Learning Readiness of PreService Teachers. *Journal of Learning and Teaching in Digital Age, 7*(1), 116- 126.

Inan, F. A., & Lowther, D. L. (2010). Factors affecting technology integration in K-12 classrooms: A path model. *Educational technology research and development, 58*(2), 137-154.

Indhumathi, R. (2020). Analysing components of e-learning readiness in lecturers and students during the Covid-19 pandemic. *International Journal of Advanced Research. 8*(7). 815-823. DOI: 10.21474/IJAR01/11344.

Irfan, A., Alfurqan, A., Esty, N. H., & Safriana, S. (2022). Teachers' Perspective on ELearning Readiness in Junior High School: A Case Study in Indonesia. *Index, 4*(1), 43-50. DOI: https://doi.org/10.32672/pic-mr.v4i1.3749.

Jethro, O.O., Grace, A.M., & Thomas, A.K. (2012). E-Learning and Its Effects on Teaching and Learning in a Global Age. *International Journal of Academic Research in Business and Social Sciences, 2*(1), 203-210.

Joshi, D., P. & Pandey, J. (2012). Use of e-learning in Uttarakhand school education system: case study of open source e-learning tools for fundamental mathematics and sciences. *International Journal of Computer Science and Technology, 3*(1), 80-82.

Joshi, P. (2011). Assessment of e- learning readiness among senior secondary school teachers and students in relation to their locus of control technostress and computer self efficacy *[Unpublished doctoral dissertation]*. Panjab University, Chandigarh, India.

Kabir, M. R. (2020). Impact of faculty and student readiness on virtual learning adoption amid Covid-19. Revista Internacional de Educacion Para La Justicia Social, 9(3), 387-414. Kader, M. A. R. A., Abd Aziz, N. N., Zaki, S. M., Ishak, M., & Hazudin, S. F. (2022). The effect of Technostress on Online Learning Behaviour among Undergraduates. *Malaysian Journal of Learning and Instruction, 19*(1), 183- 211. DOI: https://doi.org/10.32890/mjli2022.19.1.7.

Karataş, K., Şenturk, C., & Teke, A. (2021). The Mediating Role of Self-Directed Learning Readiness in the Relationship between Teaching-Learning Conceptions and Lifelong Learning Tendencies. *Australian Journal of Teacher Education, 46*(6), 54-57.

Karmakar, C. K., & Wahid, C. M. (2000). Recommendations for Bangladesh towards e-learning readiness. Department of computer science. *Shah Jalal University of*

science and technology, 97-102. https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Karmakar+%26+Wahid%2C+2000&btnG.

Kaur, K. & Abas, Z. W. (2004). An assessment of e-learning readiness at the Open University Malaysia. *International conference on computers in Education,* ICCE 2004, Melbourne, Australia. http://library.oum. edu.my/repository/115/

Keramati, A., Afshari, M., M., & Kamrani, A. (2011). The Role of Readiness Factors in E- learning Outcomes: An empirical Study. *Computers & Education, 57*(3), 1919-1929.

Keung, K., & So, T. (2005, July). The e-learning readiness of teachers in Hong Kong. In Fifth IEEE *International Conference on Advanced Learning Technologies* (ICALT'05) (pp. 806-808). IEEE. DOI: 10.1109/ICALT.2005.266.

Khalifeh, G., Noroozi, O., Farrokhnia, M., & Talaee, E. (2020). Higher education students' perceived readiness for computer-supported collaborative learning. *Multimodal Technologies and Interaction, 4*(2), 1-13.

Khilani, Y., & Awad, H. (2017). E-learning readiness of Jordanian Universities. *Journal of Information & Knowledge Management 7*(11).1-6.

Kituyi, G. & Tusubira, I. (2013). A framework For The Integration of E-learning in Higher Education Institutions in Developing Countries. *International Journal of Education and Development using Information and Communication Technology, 9*(2), 19-36.

Kolo, I., & Zuva, T. (2020, October). E-Learning Readiness Frameworks and Models. *In Proceedings of the Computational Methods in Systems and Software* (pp. 200-211). Springer, Cham. DOI: 10.1007/978-3-030-63322-6_16.

Kozma, R. B. (2003). ICT and educational change: A global phenomenon. Technology, innovation and educational change: A global perspective, 1-18. https://www.academia.edu/42103131 /Global_ Perspectives.

Kumar, (2015). A study on attitude and opinion towards using computer technology in teaching among B.Ed. trainees in Tiruchirappalli district. *i-manager's Journal of Educational Technology, 12*(1), Nagarkoil, Tamilnadu.

Kumar, A., & Raj, A. (2015). A study of the development of primary education in Dehradun district (Uttarakhand) from 2000 to 2011. *International Journal of Research in Engineering, IT & Social Sciences, 5*(5), 28-42.

Kumar, R., & Kumar, K. (2010) Impact of e-learning on teacher effectiveness. *imanager's Journal of Educational Technology, 7*(3), 63-68.

Lakshmi, Y.V. (2021). E-learning Readiness of Higher Education Faculty Members. *Indian Journal of Educational Technology, 2*(3), 121-138.

Lakshmi, Y.V., Das, J. & Majid, I. (2020). Assessment of e-learning readiness of academic staff & students of higher education institutions in Gujrat, India. *Indian Journal of Educational Technology, 2*(1). 31-45.

Lopes, C. T. (2007). Evaluating e-learning readiness in a health sciences education institution. Proceedings of IADIS International Conference of E-Learning, Porto, Portugal. http://www.carlalopes. com/pubs/ lopes_IADIS_2007.pdf

Lucero, H. R., Victoriano, J. M., Carpio, J. T. & Fernado, P. G. J. (2021). Assessment of e-learning readiness of faculty members and students in the government and private higher education institutions in the Philippines. *International Journal of Computing Sciences Research, 5*(1), 398-406. DOI: 10.25147/ ijcsr.2017. 001.1.48.

Luu, T. M. V. (2022). Readiness for Online Learning: Learners' Comfort and SelfDirected Learning Ability. *International Journal of TESOL & Education, 2*(1), 213–224. DOI: https://doi.org/10.54855/ijte.222113

Machado, C. (2007). Developing an e-readiness model for higher education institutions: Results of a focus group study. *British journal of educational technology, 38*(1), 72-82

Makworo, E. O., Kwamboka, A. T., & Morara, N. G. (2020). E-Readiness Status of Primary Schools Implementing Digital Devices in Kisii County. *International Journal of Recent Contributions from Engineering, Science & IT, 8*(1), 24-35.

Mandana, M. M. (2013). Evaluating E-learning Readiness of Faculty of Letters of Hacettepe University [Unpublished Master Thesis]. Hacettepe University, Ankara.

Marliani, R. S., & Bandung, Y. (2016). Measuring E-learning readiness in metrology training center ministry of trade of Indonesia in Information Technology Systems and Innovation (ICITSI), 2016 *International Conference on IEEE:* 1-6. DOI: 10.1109/ICITSI.2016.7858211.

Maruti, J. S. (2010). e-Learning readiness among public primary teacher training colleges in Kenya. [*Unpublished Master's Thesis*]. Kenyatta University.

Mitzel, H. E. (1982). *Encyclopedia of Educational Research (5th Edition).* New York: Free Press.

Mndzebele, N. (2013).Teachers readiness in using ICT in the classroom: The case of a developing country. *International Journal of Information and Education Technology, 3*(4), 409-412. DOI:10.7763/ijiet.2013.v3.309.

Moftakhari, M. M. (2013). Evaluating e-learning readiness of faculty of letters of Hacettepe [Master thesis]. Ankara: Hacettepe University. URL http:// hdl.handle.net/11655/1221.

Mohalik, R., & Sahoo, S. (2020). E-Readiness and Perception of Student Teachers' Towards Online Learning in the Midst of COVID-19 Pandemic. https://ssrn.com/abstract=3666914.

Mokaripor, P., Shokrpour, N., & Bazrafkan, L. (2020). Comparison of readiness for elearning from the perspective of students and professors of Medical. *Journal of Education and Health Promotion, 9*(1), 1-7.

Mosa, A. A., Mahrin, M. N., & Ibrrahim, R. (2016). Technological Aspects of ELearning Readiness in Higher Education: A Review of the Literature. *Computer and Information Science, 9*(1), 113-127.

Mosadegh, H., Kharazi, K., & Bazargan, A. (2011). Conducting feasibility of elearning in gas companies in Yazd province. *Journal of Science and Technology Information, 3*, 547-569.

Moursund, D., & Bielefeldt, T. (1999). Will new teachers be prepared to teach in a digital age? A national survey on information technology in teacher education. https://eric.ed.gov/?id=ED428072.

Mouza, C. (2002). Learning to teach with new technology: Implications for professional development. Journal of Research on Computing in Education, 35(2), 272-289. DOI: https://doi.org/10.1080/ 15391523.2002. 10782386.

Muharina, A. S., & Kelana, B. (2017, November). E-leaming readiness measurement on Indonesian student from individual perspective: A case study. In 2017 *International Conference on Sustainable Information Engineering and Technology (SIET)* (pp. 353-357). IEEE. DOI: 10.1109/SIET.2017.8304163

Mutiaradevi, R. (2009). Measuring E-Learning Readiness in the Forestry Research and Development Agency of Indonesia. Victoria University of Wellington. http://hdl.handle.net/10063/1067

Navani, Y., & Ansari, M. A. (2016). A study of e-learning readiness of university faculty. *International Journal of Current Research, 8*(8), 35752-35756.

Navani, Y., & Ansari, M. A. (2020). Study of e-learning readiness of teachers of state agriculture university. *International Journal of Agriculture Sciences, 12*(3), 9508-9512.

Newton, R. (2003). *Staff Attitudes to the Development & Delivery of E-Learning*. New Library World, 704 (10), 412-425

OECD (2005). E-learning in tertiary education: Where do we stand?, *Education & Skills, 4,* 1-293.

Omoda, G., & Lubega, J. T. (2011, August). E-learning readiness assessment model: A case study of higher institutions of learning in Uganda. *In International conference on hybrid learning* (200-211). Springer, Berlin, Heidelberg. https://link.springer.com/chapter/10.1007/978-3- 642-22763-9_19.

Ouma, G. O. (2013). Level of E-Learning Implementation Readiness in Public Secondary Schools: A Study of Rachuonyo North and Rachuonyo South Districts, Kenya [Unpublished Master thesis]. Kishi University, Kenya.

Paliwal, M., & Singh, A. (2021). Teacher readiness for online teaching-learning during COVID − 19 outbreak: a study of Indian institutions of higher education. *Interactive Technology and Smart Education, 18*(3), 403-421. DOI: https://doi.org/10.1108/ITSE-07-2020-0118.

Panayiota, H. (2009). The e-Learning readiness of Cyprus primary teachers ahead of dias system integration into Cyprus schools. *European Journal of Open, Distance and E-Learning.* 34-51. https://files.eric.ed.gov/fulltext/EJ911763.pdf.

Pramana, S. & Astuti, E. T. (2022). Mapping of Education Quality and E-Learning Readiness to Enhance Economic Growth in Indonesia. *Asian Journal of Business Environment, 12*(1), 11–16. https:// doi.org/10.13106/AJBE.2022. 12(1), 11

Rohayani, A. H. (2015). A literature review: readiness factors to measuring e-learning readiness in higher education. *Procedia Computer Science, 59*, 230-234. DOI: https://doi.org/10.1016/j.procs.2015.07.564.

Rosenberg, M. J. (2000). The e-learning readiness survey: 20 key strategic questions you and your organization must answer about the sustainability of your elearning efforts, http://www.ucalgary.ca /~srmccaus /eLearning_Survey.pdf.

Rupinder, H. (2016). *Effectiveness of an environmental education programme utilizing ICT in influencing environmental sensitivity awareness ethics and attitudes among secondary school students.* Published dissertation for the degree of doctor of philosophy, Kurukshetra Universi, Retrieved from http://hdl.handle.net/10603/94176

Sayeda, Amra, S. & Mustafa, (2012). *Awareness and use of information communication technology, ICT: comparative study among graduate and postgraduate students of faculty of arts and faculty of social science*. Published dissertation for the degree of doctor of philosophy. Aligarh Muslim University. Retrieved from http://hdl.handle.net/10603/49877

Schreurs, J., Ehlers, U., & Rachel, M. (2008). Measuring e-learning readiness. *International Association of online engineering.* http://hdl.handle.net/1942/8740.

Selltiz, C., Jahoda, M., Deutsch, M., & Cook, S.W. (1959). *Research methods in social relations (Revised edn.)*. New York: Holt, Rinehart & Winston.

Setati, P. P. (2012). Assessment of Teachers' E-learning Readiness in Rural South African Schools *[Unpublished Master thesis]*. Tshwane University of Technology, Pretoria, South Africa.

Shahroury, F. R. (2014). A Conceptual Model of E-Learning Readiness: The Case of The Ministry of Higher Education and Scientific Research in Jordan. : The Third International Conference on Informatics Engineering and Information Science (ICIEIS2014) At: Lodz University of Technology, Lodz, https://www.researchgate.net/publication/ 265852805.

Shaunessy, E. (2007). Attitudes toward information technology of teachers of the gifted. *Gifted Child Quarterly, 51*(2), 119-135.

Sitienei, P. J. (2015). E-Learning readiness and ICT usage among public primary schools in Athi River Sub County. [Unpublished master thesis]. Nairobi : University of Nairobi.

So, T., & Swatman, P., M., C. (2006). E-Learning Readiness of Hong Kong Teachers. In Lau, B., T., & Sim, C., H. (2008). Exploring the extent of ICT adoption among Secondary School Teachers in Malaysia. *International Journal of Computing & ICT Research, 2*(2), 19-36.

Summak, M. S., Baglıbel, M., & Samancıoglu, M. (2010). Technology readiness of primary school teachers: A case study in Turkey. *Procedia-Social and Behavioral Sciences, 2*(2), 2671-2675.

Suwarsono, L. W. (2015). Pengukuran e-learning readiness padamahasis wateknik Universitas Telkom. Psympathic: *Jurnal Ilmiah Psikologi, 2*(2), 141-152.

Tang, S. F., & Lim, C. L. (2013). Undergraduate students' readiness in e-learning: a study at the business school in a Malaysian private university. International *Journal of Management & Information Technology, 4*(2), 198–204.

Tarus, J., Gichoya, D. & Muumbo, A. (2015). Challenges of Implementing E-learning in Kenya: A case of Kenyan Public Universities. The International Review of Research in Open and Distributed Learning, 16(1), 120-141.

Thangarajathi, (2011). Internet utilization among B.Ed. students. *i-manager's Journal of Educational Technology, 8*(2), Nagarkoil, Tamilnadu.

Thaufeega, F. (2016). Institutional and Learner Readiness for eLearning in the Maldives [Unpublished Doctoral dissertation]. Brunel University London.

Torun, E. D. (2020). Online distance learning in higher education: E-learning readiness as a predictor of academic achievement. *Open Praxis, 12*(2), 191-208.

Trayek, F. A. A., Ahmad, T. B. T., & Nordin, M. S. (2014). E-learning readiness and its correlates among secondary school teachers in Nablus, Palestine. *Recent Trends in Social and Behaviour Sciences, 20*(1), 229-234.

Trived, C., Mihir & Bose, N. V. (2015). *A study of ICT awareness need and use among secondary and higher secondary school teachers of Saurashtra region of Gujarat.* Published dissertation for the degree of doctor of philosophy, Saurashtra University. Retrieved from http://hdl.handle.net/10603/93078

Vaisla, K. S., & Pant, D. (2012). Government to Citizen (G2C) E-Readiness Of Uttarakhand. *Journal of Computing Technologies, 1*(1), 1-6.

Viju, M. J. (2014). *Application of ICT Information Technology and Communication in Communicative Language Learning.* Published dissertation for the degree of doctor of philosophy, Mahatma Gandhi University. Retrieved from http://hdl.handle.net/10603/114645

Yun, G., & Murad, M. (2006). Factors influencing psychology and skills of the secondary school teachers'e-learning readiness: A case study in Malacca, Malaysia. *In Fourth International Conference on Multimedia and Information and Communication*

Technologies in Education (M-ICTE 2006). http://www. formatex. org/micte2006/pdf/2135-140. pdf.

Yurdugul, H., & Demir, O. (2017). An investigation of pre-service teachers' readiness for e-learning at undergraduate level teacher training programs: The case of Hacettepe University. Hacettepe Universitesi Egitim Fakultesi *DergisiHacettepe University Journal of Education, 32*(4), 896-915. DOI: 10.16986/huje.2016022763.

PHOTO GALLERY – DATA COLLECTION

The Middle School, Melaseval

Sri Gandhiji Primary School, Meladesamanickam

Saraswathy Primary School, Keelaseval

PUPS, Reddiyarpatti

Corporation Primary School, Perumalpuram

Corporation Primary School, Perumalpuram

TDTA Primary School, Palayamkottai

PUPS, Melaseval

Manakavalampillai Primary School, Palayamkottai

PUMS, kooniyur

ANNEXURE

RESEARCH TOOL – TEACHERS

Dear Teachers,

I am doing a project in the title *'e* – READINESS' AMONG PRIMARY TEACHERS TO INTEGRATE ICT IN TEACHING AND LEARNING PROCESS under the proceedings of Director, State Council of Educational Research and Training, Chennai. This form has few statements. Please read each statement carefully and then indicate your opinion on each statement by putting a tick mark (✓) in the space provided beside it. Please put (✓) mark in only one column for each statement.

Yours

Sincerely,

Rubyselvarani . V

1. Name & School address -

2. Gender - Male ☐ Female ☐

3. Age - below 40 ☐ above 40 ☐

4. Qualification - UG ☐ PG ☐ M.Phil / Ph.D. ☐

5. Nature of the school - Primary ☐ Middle ☐

6. Type of school - Govt. ☐ Govt. Aided ☐

7. Location of the Institution - Urban ☐ Rural ☐

8. Year of Experience - below 20 years ☐ above 20 years ☐

9. Undergone trainings in ICT - Yes ☐ No ☐

E-READINESS RATING SCALE

Dear Teachers,

I am doing a project in the title *'e* – READINESS' AMONG PRIMARY TEACHERS TO INTEGRATE ICT IN TEACHING AND LEARNING PROCESS under the proceedings of Director, State Council of Educational Research and Training, Chennai. This form has few statements. Please read each statement carefully and then indicate your opinion on each statement by putting a tick mark (✓) in the space provided beside it. Please put (✓) mark in only one column for each statement.

Instruction:

- **Strongly Agree - SA**
- **Agree - A**
- **No Idea - No Idea**
- **Disagree - D**
- **Strongly Disagree - SD**

S. No.	Statement	Strongly agree	Agree	No Idea	Disagree	Strongly Disagree
Psychological Readiness						
1	I easily get motivated when I teach through Electronic Media					
2	Teaching through electronic media builds confidence in me					
3	When I teach using electronic media, the students will remember it for a long time					
4	I easily get frustrated when I feel that I don't have the ability to use the electronic media for teaching					
5	Using electronic media for teaching increases my creativity					
6	Using Internet for my teaching help the students to achieve more					
7	I feel anxious to use e-gadgets					
8	I feel that use of Electronic media will help me to enhance my knowledge					
9	Using Electronic media helps me to enhance my skills					
10	Use of Electronic media in teaching learning process increases stress in me					
11	I feel that using e-gadgets for my teaching create health problems like low vision, head ache etc.,					

12	I feel comfortable in using upgraded soft ware's and its applications					
Technological Readiness						
15	I know how to turn on and shutdown the e-gadgets properly					
16	I feel confident in using the computer hardware components like key board, mouse, printer etc.,					
17	I can save / open the documents in the computer/laptop/mobile					
18	I can open or send E-mail with file attachments					
19	I know how to navigate the web pages like go to next page, go to previous page etc.,					
20	I know how to access online library and resource databases like E-journals, E-books etc.,					
21	I feel comfortable in downloading files from Internet					
22	I feel comfortable in installing simple software like Adobe reader, Foxit reader etc.,					
23	I know how to transfer the data from computer to storage devices like pen drives, CD's, DVD's etc.,					
24	I know how to use word processing application comfortably					
25	I know how to use PowerPoint application comfortably					

26	I know how to use Excel applications					
Content Readiness						
29	Electronic Media helps me to get updated information					
30	The content available in the electronic media is highly useful for my teaching					
31	I feel that the information provided in the Internet is highly reliable					
32	I can get more information related to my teaching through internet					
33	The information in the internet can be easily accessible					
34	I can easily copy/download the content from the Internet					
35	The information provided in the Internet related to my teaching helps me to widen my knowledge					
36	When I have doubt related to my teaching, I immediately access the internet to clear them					
37	Using internet helps me to access information at any time /any where					
38	Internet helps me to get worldwide information easily					
Equipment Readiness						
41	I have my own personal computer/ laptop etc., at my home					

42	I use I-pod, mobile internet, Bluetooth speakers etc., for my teaching					
43	My institution is provided with E-learning facilities					
44	The computer at my home/institution is provided with hardware accessories like Printer, Scanner, CD-ROM's etc.,					
45	Computer which I use at home/institution is in good working condition					
46	I have E-learning facilities in my home					
47	My school library is equipped with E-resources facilities					
48	If my institution implements E-learning facilities it would be helpful for me					
49	Speed, quality and connectivity of internet connection provided in my institution/home is good					
Financial readiness						
52	It does not result in students neglecting important traditional learning resources (e.g., library books)					
53	I like to spend money for accessing internet for my teaching-learning process					
54	Using electronic media for education helps me to reduce the cost of education					

55	I don't have enough money to spend for accessing the electronic media					
56	I pay a huge amount of money to getting printouts, writing CD's/DVD's etc.,					
57	If my school provides me free internet access, it would be helpful for me					
58	The money which I spend for taking print outs are affordable					
Human Resource Readiness						
61	My colleagues help me in accessing the computer and the internet					
62	My colleagues discourage me when I use electronic media for studies					
63	My higher authority encourages me when I use electronic media for my studies					
64	My teachers assist me in using electronic media					
65	My teachers are approachable to clarify my doubts related to the use of computers					
66	If I have any doubt regarding the use of computers/electronic media I feel free to ask my colleagues					
67	My colleagues are highly competent to use electronic media					

68	When I come across any problem regarding the use of electronic media/ computers, I immediately clear it by getting suggestions from the experts					
69	My family members help me in accessing the computer and the internet					
70	My colleagues assist me in using computers / electronic media					
71	I attended trainings/seminars/workshops etc., conducted by DIET/SSA/colleges/Universities in the field of ICT					
72	I have participated in the preparation of video related to subject/video mapping and video rating conducted by DIET					

Integration of ICT in the teaching and learning process Scale

Integration of ICT in the teaching and learning process among primary teachers. Choose any one of five-point Likert scale for responses: 1 (Strongly Disagree), 2 (Disagree), 3 (Neutral), 4 (Agree), and 5 (Strongly Agree).

Sl. No.	Statements	Strongly agree	Agree	No Idea	Disagree	Strongly Disagree
1	I regularly use ICT tools to enhance my lesson plans.					
2	My students often use computers or tablets during class activities.					
3	I incorporate educational software into my teaching on a weekly basis.					
4	I use the internet to find and incorporate teaching resources.					
5	I frequently employ multimedia presentations in my lessons.					
6	I use online assessments to evaluate my students' progress.					
7	My classroom activities often include the use of interactive whiteboards.					

8	I integrate ICT in teaching to cater to different learning styles.					
9	I use online collaboration tools to facilitate group work among students.					
10	ICT tools have helped improve student engagement in my classes.					
11	I use digital storytelling to enhance the learning experience.					
12	I incorporate video conferencing tools for guest lectures or virtual field trips.					
13	I encourage students to use online research for their assignments.					
14	I use educational apps to support student learning.					
15	My students use digital tools to create their projects and presentations.					
16	I regularly attend ICT training sessions to improve my teaching practices.					

17	I feel confident using ICT tools in my teaching.					
18	I integrate social media into my teaching to enhance learning.					
19	I use virtual labs or simulations for teaching complex concepts.					
20	My lesson plans include the use of ICT for differentiated instruction.					
21	I use digital games to reinforce learning concepts.					
22	I employ data analysis tools to track student performance.					
23	I encourage students to use e-books and online libraries.					
24	I use blogging or digital portfolios for student reflections.					
25	I incorporate augmented reality (AR) or virtual reality (VR) in my lessons.					
26	I use cloud storage to share resources with my students.					

27	My students frequently use coding or programming tools in class.					
28	I use ICT to facilitate student-centered learning activities.					
29	ICT has improved my ability to provide personalized feedback to students.					
30	I integrate ICT in assessments to provide instant feedback to students.					

ABSTRACT

TVL 05

Name of the DIET :Tirunelveli

Name and Designation of the Researcher :V. Rubyselvarani, Lecturer, DIET, Munanjipatti

Title: e-readiness among Primary Teachers in Integrating ICT in Teaching Learning Process.

1.Introduction: e-readiness refers to a country's capacity and state of preparedness to participate in the electronic world. In teaching it means that a new teacher has the skills and knowledge required for effective teaching, sufficient knowledge of the subject matter that they will be teaching and personal characteristics and competencies that allow them to engage in the profession through effective relationship building. Towards the teaching, learning readiness is the observable traits that indicate young children are ready to receive early academic instruction. Coronavirus (COVID-19) outbreak has utterly disrupted the worldwide education system and compelled emergency immersion of unplanned and rapid online teaching-learning. The online teaching readiness would highly depend on the competencies of teachrs and skills to adapt the pedagogy and new roles by the teachers. After a year all the teachers returned to their traditional way of teaching. In this context, this study aims to assess primary teachers e-readiness in teaching learning process. In such a way how the teachers are involved or prepared to integrate ICT in their teaching learning process.

2. Need and significance: Information and Communication technology is the most significant challenge that now confronting education at all levels. The challenge in brief is that how the process of education and teaching are affected by the increasing pace of the digital information & communication technology revolution and the emergence of a knowledge society where a much greater percentage of workforce than previously will need skills to create access and share knowledge. Pandemic situation shut the school education across the world. All the children are out of the classroom. As a result, education has changed dramatically with the distinctive rise of e-learning whereby teaching is undertaken remotely and on digital platform with this sudden shift away from the classroom, the students should adapt to the technological means of learning. So, to know

how the students are ready to walk through the situation. And now how the teachers are prepared to integrate ICT back to the traditional way of teaching.

3.Objectives:

- To study the overall e-readiness among primary teachers in terms of
    - Gender
    - Age
    - Location
    - Type of institution
    - Use of gadgets
    - Parental education and occupation.

4.Hypothesis:

- There is no significant difference between male and female primary teachers in e-readiness
- There is no significant difference between rural and urban primary teachers in e-readiness
- There is no significant difference between the Government and Government aided primary teachers in e-readiness.

5.Methodology:

a) Method: Random Sampling Method

b) Sample: The sample consists of 217 teachers at primary level working primary and middle schools in Tirunelveli District

c) Intervention: Implementation of tools to the primary teachers

d) Tool: Researcher made Tool: e-readiness tool for primary teachers

e) Data Analysis: Percentage Analysis, t-test includes the group means, sizes, standard deviations, and standard errors

6. Major Findings: More than 63% of primary teachers have moderate level of e-readiness to integrate ICT in teaching learning process. 18% of male teachers have

high and 11 % of female teachers have high level of e-readiness to integrate ICT in teaching learning process.

7. Conclusion: integrating ICT in teaching learning process provides more exposure and experience to teachers and to the students as well. The pandemic has paved way for exploring different roles, skills sets and special competencies for the teacher to conduct the online learning modules, videos, pictures and presentation for the students better involvement and knowledge enhancement. So, the teachers can practice the digital mode of teaching among the traditional way of teaching when it is needed. The present study attempted to answer a unique question: To what extent are the primary teachers ready to use the current technologies in their teaching environments? The overall analysis revealed that slightly over half of the participants have

8. Educational Implications: The teachers can provided with more ICT related training for the betterment of the professional development.

Data collection – TDTA Primary School, Samathanapuram

Tool Implementation in Panchayat Union Primary School, Reddiyarpatti

Panchayat Union Primary School, Perumalpuram

Tool Implementation – The Middle School, Melaseval