"EVALUATION OF UNDERSTANDING AND MINDSET TOWARD ICT ABOUT LEARNING ICT SKILLS AMONG B.ED TRAINEES"

Thesis
Submitted for the
Degree of Doctor of Philosophy
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Maharishi School of Humanities & Arts
Session 2017 - 22

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Supervisor's Certificate

This is to certify that Mr. PREETI YADAV has completed the necessary academic turn and the swirl presented by him is a faithful record is a bonafide original work under my guidance and supervision. He has worked on the topic "EVALUATION OF UNDERSTANDING AND MINDSET TOWARD ICT ABOUT LEARNING ICT SKILLS AMONG B.ED TRAINEES" under the School of Education, Maharishi University of Information Technology, Lucknow. No part of this thesis has been submitted by the candidate for the award of any other degree or diploma in this or any other University around the globe.

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Date:

Declaration by the Scholar

I hereby declare that the work presented in this thesis entitled "EVALUATION OF UNDERSTANDING AND MINDSET TOWARD ICT ABOUT LEARNING ICT SKILLS AMONG B.ED TRAINEES" in fulfillment of the requirements for the award of Degree of Doctor of Philosophy, submitted in the Maharishi School of Education, Maharishi University of Information Technology, Lucknow is an authentic record of my own research work carried out under the supervision of Dr. HALDHAR YADAV and/or co-supervision of Dr. ANIL KUMAR DIXIT. I also declare that the work embodied in the present thesis-

i) Is my original work and has not been copied from any journal/ thesis/ book; and

ii) Has not been submitted by me for any other Degree or Diploma of any University/ Institution.

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Table of Contents

List of Table

List of Figures

Abstract

B.Ed. students in aided and unaided universities demonstrate comparable learning abilities, awareness of, and attitudes toward ICT. In comparison to B. Ed trainees with an arts degree, those with a science degree demonstrate significantly greater levels of learning capabilities, awareness, and attitude toward ICT. Female B.Ed students have much greater levels of learning capabilities, awareness, and attitude toward ICT than male B.Ed students. B.Ed trainees with a high level of awareness and a positive attitude toward ICT have significantly superior learning skills in ICT than B.Ed trainees with a low level of awareness and a negative attitude toward ICT. B. Ed. trainees with low and high awareness of ICT (gender, type of college, and type of degree) have varying levels of ICT learning skills; B. Ed. trainees with low and high attitude toward ICT have varying levels of ICT learning skills, and B. Ed. trainees with low and high awareness and attitude toward ICT have varying levels of ICT learning skills. Significant and favorable relationships were discovered between the acquisition of skills and the awareness and attitude toward ICT of B.Ed trainees. Between assisted and unaided B.Ed trainees, a significant and favorable link was discovered in terms of ICT learning skills, awareness, and attitude toward ICT. Between arts and science-graduated B.Ed trainees, a significant and favorable association was discovered in terms of ICT skill acquisition, awareness, and attitude toward ICT. Between male and female B.Ed trainees, a significant and favorable link was discovered regarding the acquisition of ICT abilities, awareness, and attitude toward ICT. As a result of this, we can deduce that as awareness and attitude rise, so do learning abilities among B.Ed., trainees.' Awareness of ICT and attitude toward ICT are the best predictors of B.Ed trainees' learning skills in ICT in aided and unassisted institutions and attitude toward ICT contributes more to B.Ed trainees' learning skills in ICT than awareness of ICT. Awareness of ICT and an attitude toward ICT are the best indicators of arts and science graduates' ability to acquire ICT skills. B.Ed trainees and their attitude toward ICT contribute more to the development of ICT skills in arts and science graduates than does awareness of ICT. Male and female students' awareness of ICT and attitude toward ICT are the best predictors of their ability to develop ICT skills. Male and female B.Ed trainees' attitudes toward ICT relate more to their ability to gain ICT skills than their awareness of ICT.

CHAPTER 1

INTRODUCTION

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INTRODUCTION

Incorporating information communication and technology into professional training schools is a significant step toward utilising ICT to prepare the next generation of workers. ICT is the most significant difficulty that teachers, schools, and teacher educators are currently facing. As a pivotal figure in the process of teaching and learning, a teacher's understanding of ICT and ability to use it effectively in teaching-learning have grown in importance for today's teacher.

In the twenty-first century, educational competencies are increasingly considered as being aligned with information and communication technology (ICT). According to Dr. Abdul Kalam, the entire objective of education in a country is to develop and expand the human resource's potential and gradually transform it into a knowledgeable society. Each country wishes to develop students who will eventually become knowledge workers in their own economy and hence global citizens. There is a requirement for transformation in every aspect of society in order to accommodate ICT. It possesses the potential to accelerate every sort of development in society. Education is the only way to integrate ICT into society's developmental features. ICT may be utilised to enhance the quality of education, thereby preparing society and its workforce to meet future challenges. It takes sufficient staff to manage and utilise ICT effectively in schools. Emerging technologies have the ability to fundamentally alter India's educational system. Only a creative and enthusiastic teacher can successfully integrate contemporary developments in ICT into the classroom.

All educators must recognise that in today's rapidly changing world, pupils must be equipped to deal sensibly with social, economic, and technological developments. The educational environment is changing rapidly and will continue to do so as a result of ICT. Integration of ICTs into teaching and teacher education is critical in the modern day.

Information and communication technologies (ICT) are electronic and/or computerised devices, as well as linked human interactive materials, that enable users to use them for a variety of teaching and learning processes, as well as for personal usage. Worldwide, educational systems are under increasing pressure to incorporate new information and communication technologies into their curricula in order to teach students the knowledge and skills necessary for the twenty-first century. With the advancement of new technology, the teaching profession is shifting away from lecture-based training and toward student-centered, interactive learning environments.

Teacher education is a series of activities designed to assist applicants in acquiring the skills, information, attitude, and values necessary to enter the profession of teaching. The educational system is more reliant on teachers than other faculties in terms of selecting the appropriate type of trainees and providing relevant professional education. Teacher education encompasses all formal and informal actions and experiences that prepare an individual to properly assume responsibilities. While ICT has expanded the possibilities in the classroom, it has also increased the responsibilities on teachers. The internet exemplifies this, and interactive multimedia is certainly critical for teachers. It must be integrated properly into conventional classroom instruction. Its adequate recognition and satisfaction of pertinent demands are critical for the integration and effective use of high-quality teacher education programmes.

From a contemporary ICT perspective, exposing student teachers to various components of ICT and their application aspects, with a particular emphasis on educational technology, would ensure that they not only acquire the necessary skills and competencies, but also develop a desirable attitude and love for the profession.

If B.Ed students are proficient in the use of ICT, they may use it effectively and efficiently to accomplish curricular objectives. Positive academic experiences will help B.Ed., learners increase their self-efficacy and teaching proficiency. Thus, incorporating technology into the classroom redefines established teacher-student

relationships and instructional techniques. Thus, the investigator seeks to investigate ICT knowledge, attitudes about ICT, and the acquisition of ICT skills among B.Ed students.

1.2 CONCEPTUAL FRAME WORK

1.2.1 ICT'S MEANING AND DEFINITION

ICT : ICT refers to the use of electronic devices or applications such as radio, television, cellular phones, computer network hardware and software, and satellite systems, as well as the different services and applications associated with them.

"ICT is a technology that enables information-related activities. These tasks include data collection, processing, storage, and presentation. Increasingly, these activities entail collaboration and communication."

"ICT encompasses any product capable of storing, transmitting, or receiving information electronically in a digital format, such as a computer, the internet, or a scanner."

"ICT is described as the synthesis of informatics and various associated technologies, most notably communication technology."

1.2.2 ICT ELEMENTS

There are numerous sorts of components in ICT:

Computer, Internet, and associated software and hardware.

Tele-Communication.

Educational-Radio.

Educational-Television.

Computer-assisted education

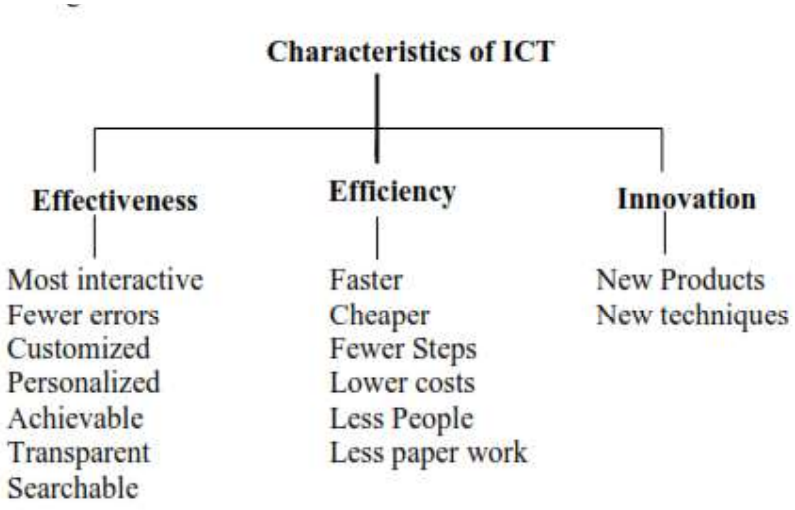
Conference through videoconference.

M-Learning

E-Learning.

1.2.3 CHARACTERISTICS OF ICT

Several critical elements of ICT must be considered when incorporating ICT into e-learning:



1.2.4 IMPORTANCE OF ICT

ICT is a necessary tool in the modern classroom; it may engage students on a variety of levels and significantly ease the teacher's job. However, the usage of ICT does not always guarantee effective learning. There may even be instances where the class is silent and absorbed in their computer/web-based activity, but derives no lasting benefit from it.

It is hard to disentangle involvement from developing children' ability to think critically and to develop their independence as learners—they are inextricably linked. All three features are intended to foster an effective learning environment.

Activities have a distinct purpose and significance.

New information is inextricably linked to previous knowledge.

The presentation is diverse.

Activities pique one's interest.

Pupils pose inquiries and experiment with novel concepts.

The pupil does an analysis of their thinking/learning.

Students derive satisfaction and pleasure from their work.

The child develops a favourable opinion of themselves as learners.

1.2.5 STAGES OF INFORMATION AND COMMUNICATION TECHNOLOGY

The teaching and learning processes are inextricably linked; we cannot regard them as distinct and independent activities. Indeed, these are comparable to two sides of the same coin, inextricably linked and interwoven. The process of teaching and learning in educational institutions worldwide can be split into four distinct stages:

Stage 1: Exploring ICT tools.

Stage 2 Instruction on the use of ICT tools.

Stage 3: Recognize when and how to employ ICT tools to accomplish a specific goal.

Stage 4 Specialization in the use of information and communication technologies.

Exploring ICT tools:

This is the very first stage. This stage focuses on teachers and students discovering new ICT tools. This relates to the new approach to ICT development.

Instruction on the use of ICT tools:

This is the second stage of the ICT-enhanced teaching and learning process. This stage focuses on the acquisition of new ICT tools; it entails the use of general or specific ICT applications.

Recognize when and how to employ ICT tools to accomplish a specific goal:

It focuses on determining how and when to employ ICT technologies to accomplish a specific task, such as completing a project. This stage demonstrates the ability to identify instances in which ICT will be beneficial, to select the most relevant tools for a particular work, and to use these technologies to solve real-world problems.

Specialization in the use of information and communication technologies:

The fourth and final stage entails developing a specialty in the use of ICT tools. This demands extensive understanding on how to use ICT tools. Students at this stage study ICT as a subject in order to become specialists. This study is more concerned with professional education than with general education.

1.2.6 ROLE OF ICT IN IMPROVING THE QUALITY OF EDUCATION:

Enhancing the educational quality is a significant problem, particularly during the time of educational expansion. ICT can enhance the quality of education in many ways: by improving learner engagement and motivation, by facilitating the process of teaching and learning, and by enhancing teacher training.

Inspiring to study

ICTs such as videos, television, and multimedia computer applications that integrate text, sound, and vibrant moving visuals can be used to give students with difficult and authentic content. Radio and other interactive media employ sound effects, songs, dramatisations, humorous skits, and other performance conventions to urge students to listen and participate in the teachings being conveyed. More

than any other type of ICT, networked computers with internet access can boost learner motivation because they combine the media richness and interactivity of other ICTs with the chance to interact with actual people and take part in real world activities.

Facilitating the acquisition of fundamental abilities

ICTs can facilitate the transmission of fundamental skills and concepts that serve as the foundation for higher order thinking abilities and creativity through drill and repetition. Educational television programmes such as Sesame Street teach the alphabet, numbers, colours, shapes, and other fundamental concepts through repetition and reinforcement. The majority of early computer applications were for computer-based learning (also known as computer-assisted training), which emphasised skill and topic mastery through repetition and reinforcement.

Increased Access to Study Materials

In the traditional educational system, students and teachers are restricted to acquiring knowledge about a particular subject solely through printed sources. However, the usage of ICT enables them to access a variety of study materials on a given subject via the internet from any location and at any time.

Assistance with Distance Education and e-learning

Distance education and e-learning are facilitated by the use of ICT. Prints, audio/video cassettes, radio and television broadcasts, computers, and the Internet are all examples of ICTs that can be utilised for this purpose. There is a subtle distinction to be made between distance education and e-learning. The usage of ICTs in e-learning is greater than in remote learning.

Enhancements to the Admissions and Examination Process

Through the use of ICTs, schools and universities can streamline the admissions process by posting admission forms online and receiving completed forms electronically. Additionally, they can generate online admit cards for entrance

examinations. Additionally, they can administer entrance and semester/annual exams online. This will significantly expedite the admissions and examinations processes. Additionally, it aids in the declaration of results more quickly.

Contribute to Research Activities

The incorporation of ICT into education enlarges the scope of research efforts. Researchers can gather knowledge about recent advancements in several segments, compile a variety of data on a specific subject, and generate novel thoughts and findings. We can quickly perform sophisticated computations and make a variety of graphs by utilising the suitable software.

1.2.7 THE BENEFITS OF INFORMATION AND COMMUNICATION TECHNOLOGY IN EDUCATION

ICT is a tool for education. It has the potential to significantly improve the quality and standards of children' education.

General Benefits

Increases the learner's autonomy.

Unlocks latent potential for those who struggle with communication.

Allows pupils to demonstrate their accomplishments in ways that are not possible through traditional techniques.

Allows for task customization according to individual talents and abilities.

ICT benefits for students

ICT is an anytime, everywhere, all subjects, all ways source of education at all levels.

When it comes to education, ICT does not perpetuate any inequalities (gender, caste, colour, country, or religion).

It is a cost-effective freshening service provider that is free of hesitation or annoyance.

ICT enables mobile education.

ICT eliminates the need for paper, chalk, and blackboards, resulting in an environmentally friendly educational environment.

ICT evaluation is a quick fix.

ICT enjoys increasing productivity and quality through repeated learning and re-access.

Today, information is a valuable resource, and knowledge is a form of power. ICT enables anyone to gain access to a wealth of information resources available via the internet and networking, empowering anyone to become self-sufficient in knowledge.

ICT enables continuous education and training throughout one's life.

Globally, ICT may enable collaborative learning.

ICT instils confidence in pupils to learn via doing, and computers can facilitate students' autonomous access to education.

Students with exceptional educational needs are capable of completing activities while working independently.

Visually challenged pupils can use the Internet in the same way as their sighted colleagues.

Students with severe and many learning disabilities have an easier time communicating.

Students who use voice communication aids develop confidence and social credibility in the classroom and in their communities.

Students with increased ICT confidence are more likely to utilise the internet at home for homework and personal interests.

ICT benefits for teachers

ICT improves instructors' quality in both teaching and research.

Reduces teachers' isolation when working with students who have special educational needs by allowing them to interact electronically with peers.

Through online conversation, encourages reflection on professional practise.

Enhances staff capabilities and fosters a better understanding of the access technology utilised by students. Collaboration with peers enhances professional development and the efficacy of ICT use with students.

Electronic materials (for example, via the Internet) are more easily converted to accessible formats such as large print or Braille.

1.2.8 ROLE OF ICT IN 21ST CENTURY‟S TEACHER EDUCATION

ICT is beneficial for both pre-service and in-service teacher education.

ICT enables teachers to communicate with their pupils.

It aids in the development of teaching abilities and promotes innovative teaching.

It contributes to the classroom's efficacy.

ICT assists teachers in their preparation for instruction. Diverse methods and strategies are used to integrate ICT into pre-service teacher education. Numerous tools are employed, including word processing, database management, and spreadsheets. Numerous technology-based plans are employed to assist teachers throughout their practise teaching sessions.

ICT trains teachers for the real-world application of their talents in the classroom and also prepares students for their future careers and social lives.

ICT is utilised as a "assistance tool" in a variety of contexts, including assignment creation, communication, data collection and documentation, and research. Typically, ICT is employed in a manner that is unrelated to the topic matter.

ICT as a mode of instruction and learning. It is a teaching and learning tool in and of itself, the medium through which teachers can instruct and students can learn. It manifests itself in a variety of ways, including drill and practise activities, simulations, and educational networks.

ICT as a widely used organisational and management tool in institutions.

Teachers must provide technical support for learning through the use of video, animation, and simulation training that assisted student teachers in presenting models. If the teacher is well-equipped with technology, the student will be as well.

ICT enables teachers to communicate with their pupils effectively. Thus, ICT helps to overcome the divide between teacher and student.

ICT enables teachers to communicate with students in a relatively short period of time.

Additionally, it assists teachers with their personnel development needs such as knowledge, attitude, and abilities.

With the assistance of ICT Institutes of teacher education can establish a communication network.

With the use of ICT, teachers can gain the most knowledge from their own networks.

1.2.9 ICT- ENABLED TEACHER EDUCATION

In teacher education, ICT-based applications and their integration with content, method, and pedagogy have the potential to serve as catalysts for students' meaningful learning. Professionals affiliated with teacher education institutions should arm themselves with the knowledge necessary to create their educational system and train teachers for the society's future (Singh, 2014). Several critical techniques for ensuring the success of an ICT-enabled teacher education programme include the following:

Teachers' knowledge and abilities about the usage of digital technologies in the teaching-learning process should be updated.

Institutions of teacher education should be provided with ICT-based resources to facilitate the integration of technology into content and pedagogy.

Professional abilities in integrating ICTs into the teaching and learning process to ensure student teachers' meaningful engagement and integration.

Educational administrators and policymakers should collaborate more closely with schools and colleges to ascertain teachers' training needs and provide assistance

for the organisation of appropriate training programmes with increased exposure at all levels.

In-service and pre-service training must incorporate the use of ICTs in pedagogical analysis, material presentation, and evaluation procedures.

Teachers at all levels of school require assistance in overcoming the barriers to effective ICT integration for the purpose of improving classroom practises.

Teachers at educational institutions should have a well-equipped ICT lab equipped with computers, satellite communication, high-speed internet access, and other electronic media to augment students' learning in this digital age.

Social science, science, and language are all disciplines. A short-term ICT-based curriculum for teacher educators and teachers should be developed as part of their professional development.

Teachers' motivation results in their active participation, which is critical for the success of result-oriented programmes and their implementation. Certification, professional growth, and formal and informal recognition at the institution and community levels are all examples of ways to keep teachers and teacher educators motivated.

Curriculum and course-specific content should be developed with an eye toward maximising the use of ICTs and backed up by a technology-mediated learning management system (LMS).

1.2.10 THE DIFFICULTIES IN ICT-INTEGRATED TEACHER EDUCATION:

Teacher education institutes should recognise the enormous potential of digital technologies and the most effective ways to integrate them into the teaching-learning process in order to maximise student learning. Teachers should be aware of evolving technology in order to truly serve various parts of society and meet the demands of the next generation of learners.

Collaboration between teacher education institutions and agencies within their range is tough when it comes to developing and implementing ICT courses for pre-service and in-service teachers.

Teachers encounter significant obstacles in classrooms due to the abundance of demands and expectations. Simultaneously, they are expected to be inventive in their approach to integrating ICTs into the classroom teaching-learning process.

The course content must be regularly changed and updated to reflect changes in technology. It is critical to align the material with emerging trends in technology-enhanced learning.

The teacher education institution should strive to maximise the potentials and opportunities available to students in order to enable them to access course materials and collaborate. As a result, it is critical for teacher educators to stay current on training and orientation via refresher courses and orientation programmes.

A significant obstacle is a lack of initiative in developing proper policies to encourage teachers and teacher educators to utilise technology.

Recognition on a content-based basis is a fundamental difficulty in the creation of effective integration. The real issue is in guiding student teachers and monitoring their work on a regular basis.

Several other common problems confronting Asian countries with regards to the efficient integration of ICTs into teacher education programmes are summarised below:

Issues with inaccessible and sparsely connected rural and distant places.

There is a dearth of spontaneous capacity building for teacher educators, trainers, teachers, and students at all levels.

The primary emphasis in educational techniques is on completing the syllabus with print materials, with less emphasis on ICT-based materials.

There is a dearth of integration of ICT-based content into curriculum design and course preparation.

Inadequate teacher education and capacity building for educators, administrators, and policy strategists.

Electricity supply is a problem for schools located in rural and semi-urban locations.

Maintaining hardware at the elementary and secondary school levels is another grey area for assuring more effective application and integration of technology.

Inadequate feedback mechanisms from a variety of formal and informal sources to ensure ongoing development of technology-mediated processes.

To ensure sustainable progress in the integration of ICTs, it is critical to provide guidance on how to integrate ICTs into teacher education and to recommend critical strategies that result in the successful deployment of ICTs in teacher education systems.

Institutions of teacher education must adapt their nature and structure to accommodate the incorporation of ICTs into teacher education.

A web-based training environment enables learners to access content at their convenience.

Design and development of a curriculum that is appropriate for persons who will work in a globalised setting and in the information age. Simultaneously, global knowledge and global resources must be considered while developing teacher education curricula.

1.2.11 ICT AWARENESS

Today's children live in a digital age. They own a plethora of e-learning platforms. They are equipped with laptops, iPods, smartphones, and desktop computers. They have 3G and 4G networks for internet access. The traditional method of teaching with a chalkboard will bring about some of the desired changes. With the use of ICT, technological advancements enable youngsters to develop numerous intelligences. To meet the demands of learners, future teachers should become familiar with evolving ICT-enabled pedagogy. To do this, teacher educators should instil in their student teachers the concepts of active learning, collaborative learning, integrative learning, creative learning, and evaluative learning, all of which are enhanced by ICT.

1.2.12 ATTITUDE TOWARDS ICT

Attitudes are a subset of mental processes believed to influence future behaviours, experiences, and beliefs, as well as having ramifications for how computers and the internet are used (Busch, 1995). However, the primary concern in education continues to be the development of teachers' positive attitudes toward information technologies (Grabe & Grabe, 1998).

The attitude of an individual is a critical factor in the learning process. The extent to which a person integrates knowledge and skills acquired through formal training effectively in the workplace is highly dependent on the subject's attitude toward training (Gattiker & Hlavka, 1992). Thus, the attitude of the teacher is a critical factor in the learning process.

1.2.13 LEARNING SKILLS IN ICT

Clearly, information and communication technologies (ICTs) are critical to teacher education. Integration of ICT is critical at the moment. Teaching has evolved into one of the most difficult careers in our society. As new notions of learning emerge, teachers are required to assist and personalise learning for individual students, rather than simply imparting knowledge and abilities. Teachers will need to develop abilities linked to the new learning settings necessitated by paradigm shifts in teaching and learning.

Each teacher must acquire new abilities to meet the demands of the classroom. For example, ICT has been integrated into education and has been shown to be an extremely valuable, entertaining, and educational tool for teachers to employ in order to keep classes active. It was deemed necessary to determine whether our teachers are skilled enough to use ICT in the classroom for instructional purposes.

1.3 NEED AND IMPORTANCE OF THE STUDY

Teachers are critical in building today's society and defining the future of educational quality. The development of a country's various sectors is highly dependent on the quality of its instructors. Thus, education systems worldwide are under increasing pressure to use new information and communication technologies to equip students with the knowledge and skills necessary for success in the twenty-first century.

The teacher's awareness of ICT enables them to value and adopt developing communication technologies and innovative practises. It serves as a guide for developing a high-quality strategy and technology plan. It enables teachers to stay current on new knowledge and skills related to the usage of new digital technologies and resources.

ICT encompasses electronic networks comprised of sophisticated hardware and software that are connected via a plethora of technical protocols. ICT can be defined as "everything that enables us to obtain information, communicate with one another, or affect the environment through the use of electrical or digital technology." While some authors refer to them as learning technologies, others simply refer to them as technology. ICT is becoming an increasingly pervasive component of the physical and social worlds that young children inhabit. It plays a significant role in the private and professional life of the majority of people, including those who assist the learning and development of young children, whether as parents, family members, caregivers, or early childhood educators. The teacher can interact with pupils of various ages, from infants to adults, as well as with students who have varying abilities and learning difficulties. If a pupil is to be prepared for the future, the instructor must be knowledgeable of current global

realities in psychology and technology. Then and only then can teacher trainees mould the next generation.

Any project aimed at enhancing the teaching and learning process must include the teacher. Additionally, if teachers are not actively involved in all phases of ICT integration into the curriculum, they will have minimal influence. Teachers are responsible for determining the most effective instructional uses of ICT in the classroom. In other words, instructors' skills and expertise in the field of ICT, as well as in other academic areas, must be upgraded. Teacher trainees are future teachers, and as such, it is critical to provide them with ICT skills so that they can teach more effectively.

The role of classroom instruction in the new technology era is shifting toward ICT. Thus, it is desirable for teachers to possess learning abilities, a favourable attitude toward ICT, and an awareness of ICT. The researcher's objective in this study is to analyse and determine the relationship between the acquisition of skills, awareness, and attitude toward ICT among B.Ed., trainees.

1.4 STATEMENT OF THE PROBLEM

The problem of the present investigation is “ASSESSMENT OF AWARENESS AND ATTITUDE TOWARD ICT AMONG B.ED TRAINEES ON LEARNING ICT SKILLS”

1.5 OBJECTIVES OF THE STUDY

The current study has the following objectives:

To assess B.Ed., trainees' ICT learning abilities, awareness, and attitude toward ICT.

To determine the differences in ICT learning capabilities, awareness, and attitude toward ICT between aided and unassisted college B.Ed trainees.

To ascertain the differences in ICT learning capabilities, awareness, and attitude toward ICT between Arts and Science B.Ed. trainees.

To compare male and female B.Ed. trainees in terms of their ICT learning skills, awareness, and attitude toward ICT.

To determine the difference between B.Ed. trainees who have a low knowledge of ICT and those who have a high awareness of ICT in terms of their ability to learn ICT skills.

To ascertain the difference in learning skills in ICT between B. Ed. trainees with a low and a high attitude toward ICT.

To determine the influence of a two-way interaction on all independent factors (awareness, attitude) on the acquisition of ICT skills by B. Ed. trainees.

To determine the interaction effect of management type, degree, and gender on the level of awareness (low and high) and attitude (low and high) of B. Ed. trainees' ICT learning skills.

To ascertain the relationship between the acquisition of ICT skills, awareness, and attitude toward ICT among B. Ed. trainees.

To ascertain the effect of management style (assisted and unaided), degree (arts and science), gender (male and female), awareness and attitude toward ICT on the acquisition of ICT skills.

To build a regression equation for the acquisition of ICT skills, we used awareness and attitude toward ICT as response factors and awareness and attitude toward ICT as explanatory variables.

To ascertain the percentage contribution of predictor variables to the acquisition of ICT skills by B.Ed trainees.

1.6 VARIABLES OF THE STUDY

The factors in this study are categorised as Independent, Dependent, and Moderator.

1. Variables that are not dependent

Comprehension of ICT

Attitude toward information and communication technologies.

2. Dependent Variable

Learning Skills in ICT

3. Moderator Variables

Gender : It is made up of both male and female B.Ed students.

Type of colleges : It encompasses both aided and unaided B.Ed. institutions.

Degree : It is composed of B.Ed. candidates in the arts and sciences.

1.7 HYPOTHESES OF THE STUDY

The following hypotheses have been developed in light of the study's aims.

There is no discernible difference between aided and unassisted college B.Ed trainees in terms of ICT skill acquisition, awareness, and attitude toward ICT.

There is no substantial difference in learning ICT abilities, awareness, or attitude toward ICT between Arts and Science B.Ed. trainees.

There is no statistically significant difference between male and female B.Ed. trainees in terms of ICT skill acquisition, awareness, and attitude toward ICT.

There is no significant difference between B.Ed. trainees with low and high awareness of ICT in terms of ICT skill acquisition.

There is no substantial difference between B.Ed. trainees with a low or a high attitude toward ICT in terms of developing ICT skills.

There was no significant interaction effect between management styles (assisted and unassisted) and levels of awareness (low and high) on the acquisition of ICT skills by B.Ed. trainees.

There was no significant interaction effect between degree (Arts and Science) and awareness (low and high) on B.Ed. trainees' acquisition of ICT abilities.

There was no significant interaction effect between gender (male and female) and awareness (low and high) on B.Ed. trainees' acquisition of ICT abilities.

There was no significant interaction effect between management styles (Aided and Unaided) and attitudes (low and high) on B.Ed. trainees' ICT skill acquisition.

There was no significant interaction effect between degree (arts and science) and attitude (low and high) on B.Ed. trainees' acquisition of ICT skills.

There is no significant interaction effect between gender (male and female) and attitude (low and high) on B.Ed. trainees' acquisition of ICT skills.

There was no significant interaction effect between awareness (low and high) and attitude (low and high) on B.Ed. trainees' ability to master ICT skills.

There is no substantial association between the acquisition of ICT skills, awareness, and attitude toward ICT among B.Ed. trainees.

There is no substantial association between supported college students' acquisition of ICT skills, awareness of, and attitude toward ICT. Trainees in the B.Ed. programme.

There is no substantial association between the acquisition of ICT skills, awareness, and attitude toward ICT in unassisted colleges. Trainees in the B.Ed. programme.

There is no substantial association between the acquisition of ICT skills, awareness, and attitude toward ICT among Arts degree B.Ed. trainees.

There is no substantial correlation between the acquisition of ICT skills, awareness, and attitude toward ICT among science-graduated B.Ed. trainees.

There is no significant association between the acquisition of ICT skills, awareness, and attitude toward ICT among male B.Ed. trainees.

There is no substantial association between the acquisition of ICT skills, awareness, and attitude toward ICT among female B.Ed. trainees.

B.Ed. trainees' awareness of ICT and attitude toward ICT are not significant determinants of ICT skill acquisition.

The awareness of ICT and the attitude of aided colleges toward ICT Trainees in the B.Ed. programme would not be major predictors of ICT skill acquisition.

Unaided college students' awareness of and attitude toward ICT Trainees in the B.Ed. programme would not be major predictors of ICT skill acquisition.

ICT awareness and attitude toward ICT among arts B.Ed. trainees are not significant determinants of ICT skill acquisition.

ICT awareness and attitude toward ICT among scientific B.Ed. trainees are not significant determinants of ICT skill acquisition.

Male B.Ed. trainees' awareness of ICT and attitude toward ICT are not significant determinants of ICT skill acquisition.

Female B.Ed. trainees' awareness of ICT and attitude toward ICT are not significant determinants of ICT skill acquisition.

1.8 SCOPE OF THE STUDY

The current study focuses on B.Ed. students at MJP Rohilkhand University in Bareilly.

The current study is limited to MJP Rohilkhand University Bareilly's aided and unaided B.Ed colleges.

The current study focuses exclusively on arts and science B.Ed students.

The current study is limited to 400 Bachelor of Education (B.Ed) students at MJP Rohilkhand University Bareilly Colleges. The study's independent variables are awareness of and attitude toward ICT.

The dependent variable in this study is the acquisition of ICT skills.

The study's moderator factors are gender, college type, and degree.

1.9 DEFINITIONS OF TECHNICAL TERMS

1. ICT AWARENESS

ICT stands for Information and Communication Technologies and is defined in this primer as a wide set of technological tools and resources used to communicate as well as to create, disseminate, save, and manage information in the field of education.

2. ATTITUDE TOWARDS ICT

Attitude is a disposition or a proclivity to respond favourably or negatively to a certain class of stimuli, such as a concept, object, person, or situation; in this case, it is toward ICT.

3.LEARNING SKILLS IN ICT

Learning Skills in ICT refers to the practical skills required to operate, develop, engage, and interact with multimedia content, as well as presenting abilities in the teaching and learning process.

4. B.ED., TRAINEES

After completing their UG/PG degree in a regular way at a college of education, students enrol in the B.Ed. degree programme.

1.10 OVERVIEW OF THE STUDY

The first chapter discussed a quick introduction, the conceptual framework, the necessity and importance of the investigation, the statement of the problem, the objectives, the variables, the definitions of technical words, the hypotheses, the scope of the study, and a summary of the study.

Chapter 2 discusses a quick review of related literature and how it aided the researcher in designing the current investigation. While presenting this chapter, an attempt was made to organise reviews according to the important themes retrieved from the study's chosen problem.

Chapter 3 discusses the methodology used in this investigation. This chapter discusses the research methodology, sample, tools utilised to gather data, data collection procedure, scoring procedure, and data analysis plan, as well as the statistical techniques employed in the study.

Chapter 4 discusses data analysis and interpretation.

Chapter 5 summarises the study. Additionally, it will present the study's significance, aims, hypotheses, variables, findings, educational implications, study limitations, and suggestions for future research.

CHAPTER 2

REVIEW OF RELATED LITERATURE

CHAPTER 2

REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION

The researcher examined the study's introduction, conceptual framework, justification for the study, objectives, explanation of the problem, variables, hypotheses, scope of the study, definitions of technical terms, and a summary of the study in the preceding chapter.

The current chapter discusses reviews of related literature, including the value of such reviews and reviews pertinent to the current topic.

2.2 THE IMPORTANCE OF REVIEWING RELATED WORKS

The review of pertinent literature is a critical step in the research process. The review of related literature entails systematically identifying, locating, and analyzing publications that contain information about the research problem. Periodicals, abstracts, reviews, books, and other research papers are examples of these documents.

The review informs the researcher of what has been accomplished and remains to be accomplished. G.A.Y. (2000).

According to Best and Kahn (2009). "A review of related literature is an invaluable tool for defining the topic, recognizing its importance, and proposing a potential data collection method, a suitable study design, and a data source."

According to David. J. Fox (2009), the literature review serves the following functions.

- The conceptual framework within which the proposed research will be conducted.

- Having a working awareness of the problem's current state of study.
- The plan, method, instruments, and data analysis.
- Assuming that the choice to pursue the study is made, an estimation of the likelihood that the targeted Research will be successful and of the significance or utility of the results.
- The study's definitions, assumptions, restrictions, and hypotheses demand specific information.

The review was conducted with the functions above in mind.

The investigator was able to review several Research linked to the problem conducted both abroad and in India through the current study's review of related literature. Three categories have been established for the reviewed studies.

- Studies on I.C.T. awareness.
- Public Opinion Research on Information and Communications Technology.
- Studies on the Acquisition of I.C.T. Skills.

2.3 REVIEW OF RELATED STUDIES

2.3.1 STUDIES RELATED TO AWARENESS OF ICT

M. Monika & J. Jayachithra (2019), Conducted a study on "M.Ed. Trainees' Awareness of Information and Communication Technology." This study aims to ascertain M.Ed students' awareness of I.C.T. The researcher conducted her Research using a descriptive survey method. The sample consists of 35 M.Ed. Students were selected through a stratified random sampling technique from education institutions in the Siva Ganga district. The data collection instrument is the Information and Communication Technology Awareness Scale (ICTAS). The data indicate no significant differences in awareness of I.C.T. by gender or location. (36: pp. 2572–2576).

M. Kanmani (2018). Conducted a study on "Awareness of I.C.T. Literacy Among Graduate Students Studying Tamil." This study aimed to determine graduate students' understanding of I.C.T. literacy; a survey was used to accomplish this. The data were gathered from 250 randomly selected graduate students. The survey discovered that graduate students lacked awareness of I.C.T. literacy. As a result, students can receive specialized training in I.C.T. literacy to help them improve their knowledge level. 27055-27057 (29: 27055-27057).

Sulaeman Santoso, Wenny F. Senjaya, Oscar Karnalim, Erico D. Handoyo, Robby Tan, Maresha C. Wijanto, & Doro Edi (2018), Conducted a study on the "Awareness of Indonesian high school students toward information and communication technology." The study examined high school pupils' awareness of I.C.T. in Indonesia. According to this study, conducted in early August 2018 with 113 respondents, most students are aware of the availability of I.C.T. and frequently engage with I.C.T. devices or services. Additionally, they are proficient in at least one I.C.T. application or skill. In conclusion, high school pupils demonstrate a high awareness of I.C.T. As a result, digital competence may be easily taught to them. (58:217-224).

P and P Johnny Rose Saravanan (2018) conducted a study on "I.C.T. Awareness and E-Resource Utilization Among Research Scholars." The study attempted to determine research academics' understanding of I.C.T. goods and applications and the amount to which they use e-resources about their I.C.T. awareness. The study surveyed 220 research researchers at Manonmaniam Sundaranar University's Kanyakumari District. The survey discovered that research academics are knowledgeable about I.C.T. products and applications and have a high level of I.C.T. awareness. By 78.6 percent, researchers favor I.C.T. goods and apps primarily for producing presentations, publications, and proposals. Among the various types of e-resources, respondents prefer e-theses and dissertations, e-journals, and technical reports to e-books and other databases. Additionally, the survey discovered no differences in I.C.T.

awareness among research scholars depending on gender, location, or type of Research. (37).

S. Kulasekara Perumal Pillai (2017) an investigation into student teachers' 'I.C.T. Awareness about Gender, Educational Qualification and College Location' An investigation into student instructors' I.C.T. knowledge is the goal of this study. A normative survey was used in this investigation. In the Cuddalore region of Tamilnadu, India, 200 student teachers enrolled in B.Ed. Institutes were chosen at random. An I.C.T. awareness test and a personal information form were used in the data collection process. The data were analyzed using descriptive and differential methods to verify the null hypothesis. Student instructors were found to have an average understanding of information and communication technologies (I.C.T.s). Furthermore, it may be concluded that there is no significant difference in background parameters such as gender, educational attainment, and college location. Consequently, teacher educators should strive to raise the awareness among student teachers. In the 32nd chapter, 52–55.

M.P.M. Pramod Kumar and M.N. Madhumalathi (2016) conducted a study titled "A Study on I.C.T. Awareness Among Teacher Educators: With a Focus on Education." This study examines the level of I.C.T. in modern teacher education institutes and speculates on possible future developments. According to the study's findings, there is a substantial disparity between male and female teacher educators when it comes to information and communication technologies (I.C.T.). Additionally, research has revealed significant differences in teacher educators from Government, Aided, and Unaided management institutions. The study suggests that success in integrating I.C.T. into education is largely dependent on instructors and their ability to deliver learner-centered, interactive instruction. (41: pp. 2781–2785).

Chaman Verma and Sanjay Dahiya (2016) "Gender differences in information and communication technology awareness among students in Indian colleges" was the subject of an investigation. This research aims to find

out how much students and professors in Indian institutions understand information and communications technology (I.C.T.). Students and faculty's attitudes about I.C.T. awareness are analyzed using statistical tools in this study. Samples from six Indian universities totaled around 900. The findings of this research will be useful to Indian university administrators in understanding the current state of their educational systems' integration of I.C.T.. (19:42–49).

Philomina M.J. and S. Amutha (2016) investigated the topic of "Information and communication technology awareness among teacher educators" The goal of this study was to find out how well-informed teacher educators in India are Tiruchirappalli District was on the importance of diversity. A total of 42 teacher educators were included in this study. Data were analyzed using descriptive statistics. According to the Research, Indian teacher educators' knowledge of I.C.T. varies by gender and subject. It was found that Ph.D. Scholars had a higher level of I.C.T. awareness than those with M.Eds and MPhils, compared to the other two degrees. From 606 to 606, (40: 603-606).

Thakur Nabin (2014), An investigation of teachers' knowledge of I.C.T. was dubbed "An Investigation into Teachers' Knowledge of I.C.T." The study's goal was to find out how well-trained teachers knew about I.C.T. and to make comparisons between male and female teachers and between instructors in rural and urban settings. Using a self-created questionnaire, data were collected from 30 West Bengal secondary schools, five in urban areas, and five in rural areas. Each school allowed ten secondary-trained teachers to administer the questionnaire, with each teacher administering the questionnaire individually. Frequencies, percentages, means, S.D., and the "t" test were used to analyze the data. I.C.T. expertise was minimal, with no statistically significant differences between male and female teachers and between urban and rural trained teachers. In the range of six to eleven (37)

.**S. Thanuskodi (2013),** Undergraduate students in rural areas were surveyed about their use of "Awareness and Use of Information and Communication Technology." The study looks at how rural students use I.C.T. A large majority

of students, according to the statistics, used the Internet at least once a week (56.53 percent). According to the findings, the vast majority of those polled (73.91 percent) turn to the Internet when looking for information on a topic. (1)–(4) (54: 1-6).

Sandhya Milind Khedekar and Sunita Magre carried out Research in 2012 on the relationship between students' use of I.C.T. and academic performance. One of the research goals was to find out how well S.S.C., CBSE, and ICSE secondary school pupils understand information and communication technology (I.C.T.), as well as whether or not such understanding is linked to academic achievement. In this study, students' knowledge of I.C.T. and academic achievement were hypothesized to be unaffected by gender or school type. A comparative and correlational descriptive strategy was used in this investigation. A random sample of 1069 pupils from English-medium secondary schools was used for this study. S.S.E., CBSE, and ICSE students in eighth and ninth grades were included in the study. Children from Mumbai's public schools were picked at random for this project. To gather information, a five-point rating scale was devised. Respondents can choose from the following options: strongly disagree, strongly disagree, disagree, and agree. Ten specialists in the field and relevant statistical approaches were used to ensure that the researcher's tools were accurate and reliable. The t-test, ANOVA, and coefficient of correlation were used to determine the mean, median, mode, standard division, skewness, and kurtosis of the data. There was a strong correlation between students' awareness and perceptions of their use of I.C.T. and their academic performance across the boards of CBSE, ICSE, and S.S.E. At (50: p. 44–48).

H.V. Vamadevappa and K.C. Shivaraj (2009), Conducted a research study on "postgraduate students' use of the internet." The study's objectives were to compare how postgraduate students with varying socioeconomic positions and academic streams, such as arts, commerce, and science, use internet facilities. The descriptive approach of Research was used in this study. The survey approach was utilized to collect postgraduate students' internet use data. The

comparison method was used to compare the high, middle, and low socioeconomic level groups regarding internet use. The 192 postgraduate students enrolled in Arts, Commerce, and Science departments were chosen at random. A total of 64 students from Arts departments, 64 students from Commerce departments, and another 64 students from Science departments were included in the sample. Each faculty picked 32 male and female postgraduate students. The researcher designed an internet access questionnaire and utilized it to collect data on the internet use of postgraduate students at Kuvempu University. Sri. Laxminarayana of Bangalore University developed and verified the Socioeconomic Status scale. The instruments were administered to 192 postgraduate students at Kuvempu University's Arts, Commerce, and Science departments. The mean, standard deviation, quartiles, and t-tests are used for data analysis. Quartiles were used to categorize postgraduate students into three socioeconomic groups: High, Middle, and Low. The study's key findings were that socioeconomic class had little bearing on how postgraduate students utilize the Internet and no significant differences between the categories. Gender did not appear to be a determinant in internet use. Postgraduate students in commerce and science are more adept at using the Internet than postgraduate students in the arts (57)

E. Rafeedali (2009). A study was conducted on "computer-based technology and its educational value." The study aimed to ascertain higher secondary school teachers' fundamental computer competence and their purpose for and level of use of computer resources in the teaching-learning process. The investigator collected data using a self-developed instrument (computer Awareness Questionnaire). The study enrolled 300 higher secondary schools in Kerala's Malappuram district. The investigator discovers that most higher secondary schools are located in Kerala's Malappuram district. The investigator discovers that most upper secondary school teachers possess basic computer skills and use computers for educational purposes, with female teachers using computers for educational reasons at a higher rate than male instructors. (43: pp. 55–59).

M. Kanmani and Annaraj. (2009). Conducted a study to see how M.Ed. Students' self-esteem and knowledge of information and communication technology (I.C.T.) affected their academic performance. The study's goals were to find out how much and what impact students' self-worth and knowledge of information and communication technology (I.C.T.) had on their ability to do well in school. 42 M.Ed students were selected randomly to participate in the study's sample. A questionnaire on self-esteem and a survey on knowledge of I.C.T.s were used to gather data. In this case, Pearson's multiple correlation The product-moment correlation coefficient, t-test, and F-test were used to analyze the data. According to the findings, there is no association between students' self-esteem and their knowledge of information and communication technology, and students' self-esteem and knowledge of information and communication technology do not affect their academic accomplishment. (30:14–18).

E.L. Adebayo and O.M. Adesope (2007), Women researchers and extensionists' awareness, access, and usage of information and communication technology were examined in a study. There has been a lack of research on information and communications technology (I.C.T.) by women in the sciences. Researchers in South Eastern Nigeria polled 106 female professors and 27 female extensionists via a survey. Both female researchers and extensionists are familiar with information and communications technology (I.C.T.) and can use it independently. Many people who took the survey don't have easy access to modern technology. On the other hand, female researchers and extensionists used I.C.T. between three and five times a week, respectively. The Internet, electronic mail, spreadsheets, word processing, CD-ROMs, computer use, web design, and chat rooms are necessities for female researchers and extensionists. (1), (2), and (3) (pp. 85-93).

2.3.2 STUDIES ON ATTITUDE TOWARDS INFORMATION AND COMMUNICATION TECHNOLOGY

Nimisha Beri and Lalit Sharma (2019), teachers' attitudes toward it have been studied to integrate I.C.T. into teacher education. The purpose of this

study is to find out how teachers-educators in teacher training institutions feel about using I.C.T.s and how well-versed they are in using I.C.T. tools and equipment. Self-prepared interview guides were used in this study. Up to 50 teacher educators from various teacher-training colleges in the Indian state of Haryana were selected for a purposive sample. ACCORDING TO THE STUDY'S FINDINGS, using I.C.T. and its tools and equipment in teacher education appears to be a positive experience for teachers. According to the findings of this study, teachers-educators' training and technological support are lacking. According to a new report by the American Association of Colleges for Teacher Education, teachers and educators are concerned about the use of technology in the classroom. (285-296) (38: 285-296).

C.N. Bindu (2017), Study on Expatriate Indian Teachers' Perceptions on I.C.T. Use in the Classroom: A Case Study Indian teachers in the United Arab Emirates (U.A.E.) are the focus of a new study explores their attitudes on using I.C.T. in the classroom. The information was acquired using a questionnaire and an in-depth interview. In the first phase of the data collection, 57 teachers from seven Indian curriculum schools were selected sequentially. Ten teachers who were also subject coordinators were picked using a selective sampling technique. Based on quantitative and qualitative data analysis, the study results show that instructors, regardless of gender or age, have a positive attitude toward the use of technology in the classroom. Regarding I.C.T. awareness, teachers' gender and age have a significant impact. According to the findings, educational I.C.T. use should be given more priority. (10) 18) (14:10).

P. Gayathri (2017). Conducted a research study titled "A Study of Novice Teachers' Attitudes Towards E-Learning in Thiruvallur District." This study aimed to ascertain teacher trainees' attitudes about e-Learning in the Thiruvallur district. The study employed the survey method. Four hundred teacher trainees from five educational colleges in Thiruvallur District participated in the study. The data collection instrument was a validated five-point questionnaire called the eLearning attitude scale (reliability 0.86). SPSS was used to conduct descriptive and differential analysis and interpret the results. It was discovered that male

beginner teachers over the age of 23 from metropolitan areas have a favorable attitude toward e-learning. 8341-8349 (2: 8341-8349).

P. Ganesan and R. Krishna Kumar (2016) conducted a research study on "Teacher educators' attitudes about I.C.T." Understanding teacher educators' attitudes regarding I.C.T. is critical for incorporating its advancements into teacher preparation programs. The purpose of this study was to compare teacher educators' attitudes about I.C.T. and their level of attitude, whether favorable or unfavorable. Participants included teacher educators from Coimbatore's colleges of education. Cluster Sampling has been implemented. The findings demonstrated a considerable disparity in their attitudes toward their hometown. The majority of educator-teachers have a favorable opinion. (7-11) (24:).

Lallianzuali Fanai and Ruatpuii Chhangte (2016) A Study of Secondary School Teachers' Attitudes toward I.C.T. about Their Teaching Experience and Professional Qualification" was undertaken by researchers. We conducted this survey to find out how Mizoram's Aizwal district's secondary school teachers feel about using information and communications technology. If teaching experience and professional certifications impact instructor views toward I.C.T., this study explores that as well. According to the study, teachers' views on the use of technology were positive across all levels of education, with no significant differences detected between lower-level, intermediate-level, or even upper-level educators. According to Research, teachers' educational attainment appears to have minimal effect on attitudes toward I.C.T. Page 2878–2880 of 33

ChamanVerma, Deepak Kumar, and Sanjay Dahiya (2016) conducted a research study titled "An Analytical Approach to Investigate State Diversity in I.C.T.: A Study of Six Punjab and Haryana Universities." The student T-test with equal variances was utilized in this study to uncover relevant differences between teachers and students in terms of their state of residency. Five hundred sixty samples of students and 344 samples of teachers were collected using a stratified random sampling method from six universities in Punjab and

Haryana. The findings of this survey indicate that there are no discernible differences between students and professors in terms of their state of residency. There is no difference in I.C.T. awareness between Punjabi and Haryana students. Similarly, there is no difference in I.C.T. awareness between Punjab and Haryana faculty for the state variable. (12-14) (19).

Dixit, Mohit, and Kaur, Manpreet (2015), Conducted a study on "B.Ed., students' attitudes toward I.C.T. teaching." The purpose of this study was to ascertain the attitudes of B.Ed. Students toward the teaching of information and communication technologies. The sample consisted of 200 teacher-trainees from Punjab's Moga district. T. Pradeep Kumar's (2013) I.C.T. teaching attitude scale (ICTTAS) was utilized to collect data. The mean, standard deviation, and t-value were all employed as statistical approaches. The findings indicated characteristics such as the location and gender of B.Ed. Students affect their attitude toward I.C.T. instruction. 169–174 (35: 169–174).

J. Arul Sekhar and Arul Lawrence (2015) conducted a study on "B.Ed. trainees' attitudes toward information and communication technologies." The purpose of this study was to ascertain the attitude of B.Ed. Students toward I.C.T. The findings indicated no significant difference in the attitude of B.Ed. Trainees toward I.C.T. by gender, discipline, course of study, or location, aided colleges of education B.Ed. trainees had a more favorable attitude toward I.C.T. than government college trainees. (10: 1 to 4).

R. Victor Samson (2013), Conducted a study on "B.Ed., trainees' attitudes toward I.C.T." The study focuses on the attitude of B.Ed. Students toward I.C.T. The data suggested that the majority of B.Ed. Trainees (60.5 percent) expressed confusion about their attitude toward I.C.T., while just 39.5 percent expressed a positive view. Additionally, regardless of gender or location, B.Ed. Trainees have the same attitude toward I.C.T. (18-21) (49: 18-21).

K. Saikumari (2010), Conducted a study on "computer phobia among pupils in the ninth grade and their attitudes toward educational computer use." The study aimed to ascertain IX standard pupils' computer fear, and the investigator utilized

a random sampling technique to choose students from three sorts of schools: government, assisted, and private. A total of 310 individuals were included in the sample. Boys and girls between the ages of 13 and 15 were included in the sample. The findings indicate that school location, gender, and style of school administration have little effect on IX standard pupils' computer phobia or attitude toward computer use in education. (47) (47: 38–40).

Dilli Raj Newa and Vandana Mehra. (2009), Conducted a study on the attitudes of school instructors toward information and communication technologies. The study's objective was to ascertain the attitudes of 300 secondary school teachers' attitudes toward information and communication technology in Nepal. The study's major findings were that instructors in private and secondary schools had comparable attitudes regarding I.C.T., as did teachers from other academic streams, including language, science/mathematics, and social sciences. (55: pp. 25–31).

T. Ravichandran and J.E. Merlin Sasikala (2009) conducted a research study titled "Attitude of Teachers Towards Web-Based Learning" to ascertain the attitudes of male and female instructors and those of aided and government school teachers, toward web-based learning. The sample comprised of 100 secondary and Higher secondary school teachers in Kerala. The study's key finding was the efficient utilization of web-based learning inside the lecture room. The teacher's role is critical. Both male and female teachers have a favorable attitude toward web-based learning, with unaided school teachers having a more favorable attitude than assisted school teachers. (30-33) (45: 30-33).

Bulentcavas, Pinarcavas, Bahar, and Tarikkisla are all located in Lithuania (2009); Study on "attitudes toward educational usage of information and communication technologies among science educators." Students were asked about their views on the role of information and communication technology (I.C.T.) (I.C.T.) in the classroom and their own experiences with and knowledge of computers at home. According to the Turkish State Planning Organization, 1071 primary school science teachers, three cities from Turkey's seven regions,

and three socioeconomic class categories were stratified for the study. To gather information, the researcher devised a questionnaire with three sections: The first section of the survey asked about the demographics of science teachers, such as their gender, age, number of years of experience, and the type of school they teach at. The second part of the survey asked 11 questions about students' familiarity with computers and teachers' knowledge of I.C.T. The final part of the paper focused on science teachers' views on the integration of I.C.T. into classrooms. Scientists were asked to answer a series of 31 Likert-type questions about their attitudes toward using I.C.T. in education. "I.C.T.'s effect on teaching and learning" and "I.C.T. implementation hurdles" were the two subscales of this scale. The researcher used parametric statistics such as ANOVA and t-tests and pair-wise comparisons to determine any differences between teachers' attitudes and other dependent variables in the study. To determine statistical significance, the significance threshold of 0.05 was established in advance. Turkish science teachers have positive attitudes toward I.C.T., although these opinions do not differ by gender but by age, personal computer ownership, and computer expertise. In Chapter 18: 20–33.

2.3.3 STUDIES ON ICT SKILLS LEARNING

Simin Ghavifekr and Wan Athirah Wan Roddy (2015) The effectiveness of I.C.T. integration in schools was examined in the study named "Teaching and Learning with Technology." The study's goal was to determine what teachers thought about the effectiveness of I.C.T. integration in aiding classroom teaching and learning. In Kuala Lumpur, Malaysia, 101 teachers from ten public secondary schools were given a survey questionnaire. SPSS (version 21) software was used to perform descriptive and inferential statistical analyses on the data collected for this quantitative investigation. According to the findings, teachers and kids alike benefit much from I.C.T. integration. According to the study's findings, teachers who are well-prepared with I.C.T. tools and facilities are important to the success of technology-based teaching and learning. In addition, it was shown that teacher professional development programs were crucial in improving students' quality of learning. Other areas of I.C.T. integration, such as

strategic planning and policy formation from a management perspective, must be examined for future Research. Page 38-43 of 52:

Dedja Marsida (2015), Study on the use of I.C.T. in foreign language education: advantages and difficulties It is imperative that teachers and students have access to I.C.T. in foreign language teaching and learning for both groups to be able to thrive in the information age. This research aims to look into the advantages of using I.C.T. in foreign language instruction. The key advantages and challenges of using information and communication technology (I.C.T.) in a foreign language. Our society faces a tremendous integration challenge in recognizing and integrating I.C.T. in education. To meet the Albanian Ministry of Education's goal of integrating I.C.T. into education, the use of I.C.T. in language instruction and learning appears to be a necessary precondition. Students can strengthen their communication skills and learn more about the culture and people of the nation and the language they are learning by using authentic information from the Internet. (44-66) (34: 42-46).

Bhalla Jyoti (2013), Teachers' usage of computers in the teaching-learning process was the subject of a study. This study examined the computer usage of 300 Indian primary school teachers. Computer-assisted learning (C.A.L.), computer-managed instruction (CMI), and computer-assisted instruction (C.A.I.) were the focus of a questionnaire prepared for teachers (C.A.I.). This study indicated that teachers commonly used computers to maintain their subject knowledge and teaching skills, design lesson plans, produce new content, share relevant information via the Internet, and create question banks. In the classroom, on the school's website, and in creating test papers, simulations, and games for students, they occasionally employed computers for these purposes. Students' classroom presentations, tutorials, sharing information with parents, publishing homework, administering tests to students—offline or online—maintaining student records, and providing individualized instruction were all done without the aid of computers, which they either rarely or never used. Teachers prefer to use computers for C.A.L. over C.A.I., according to the study results. Using the

findings from this study, instructors' computer use can be better understood. (28:30-32)

Smriti Malhotra and Anita Rastogi's (2013) "I.C.T. Skills and Attitude as Determinants of I.C.T. Pedagogy Integration" was studied in a research project. Specifically, the study looked at teachers' attitudes about I.C.T. and the extent to which they are proficient in I.C.T. abilities and the most successful methods they employ I.C.T. in their current educational practices. Teacher I.C.T. skills and attitudes may be so strong, or they may be so committed to various pedagogical inputs in the teaching-learning process that it is unlikely that they will be integrated into pedagogy shortly, leaving both strengths hanging on their own. The study's goal was to find out how I.C.T. skills and a good attitude toward technology may assist in integrating I.C.T. and pedagogy. According to this study, I.C.T. skills, attitudes toward technology, and usage of technology in classroom instruction are linked positively. This is on pages 301–304 of the book.

S. Francisca (2012), Research was conducted to determine the level of I.C.T. competency of B.Ed trainees based on their diverse backgrounds, including gender, age, the field of study, type of institution, and nature of the institution. Background variables, such as gender, age, subject, qualification, type of institution, and nature of the institution and the significant difference between B. Ed trainees' I.C.T. competency and dimensions about background values will be analyzed in this study. The study's findings The computer skills and internet knowledge of the trainees, both male, and female, varied greatly. Male trainees outperform female trainees in terms of skill and knowledge acquisition. Students in the arts and sciences have vastly different I.C.T. skills. Those who major in science are better teachers than those who major in the arts. There is a considerable difference in I.C.T. proficiency between undergraduate and graduate students. A PG degree confers greater competence on trainees than does a U.G. degree. (12: 40–44) (42)

Abiodun-Oyebanji Olayemi and K Omotayo (2012) examined the "I.C.T. adoption and effective secondary school administration in Ekiti State" study. The study aimed to determine how well Ekiti's secondary schools used information

and communications technology (I.C.T.). 180 secondary school administrators were selected for the convenience sample from the state's three senatorial districts. I.C.T. and secondary school administration was the subject of a questionnaire that collected data for the study. The t-test, Pearson Product Moment Correlation, and frequency counts were employed to analyze the data. Among other findings, the survey found that the vast majority of secondary schools studied lacked access to I.C.T. resources. While there is a strong correlation between I.C.T. adoption and effective secondary school administration, gender distinctions do not affect their attitudes toward I.C.T. and effective secondary school administration, according to the study's findings. Therefore, it was recommended that governments and private citizens provide adequate I.C.T. facilities in secondary schools. School leaders at secondary institutions should also be given incentives to become tech-savvy to further boost efficiency. 59 to 63 (2: 59–63).

Buabeng-Andoh, Charles (2012). Teachers' I.C.T. skills, perceptions, and practices in Ghanaian second-cycle schools were examined in this study. This research was carried out to find out more about the I.C.T. skills, perspectives, and practices of Ghanaian second-cycle teachers. The questionnaires were distributed to 273 teachers from various departments; 241 were returned, and 231 could be used for data analysis, resulting in an overall response rate of 85%. Two hundred thirty-one teachers were 66 percent men and 34 percent women. Those between the ages of 30 and 39 made up the vast majority of responded. It has been discovered that teachers have a positive attitude about using I.C.T. However, this is not statistically significant. I.C.T. use, age, and teaching experience were all found to have an inverse correlation. Many teachers were found to lack fundamental I.C.T. knowledge and the ability to use I.C.T. in their teaching and learning activities. There is a strong possibility that teachers have not yet transitioned from teacher-centered instruction to learner-centered instruction. I.C.T.s and instructional design should be incorporated into basic teacher education programs to increase teachers' confidence and attitudes about using I.C.T.s. (20:36-49)

F.L. Antony, and P. Annaraja (2011), Researching teachers' learning abilities and I.C.T. awareness to identify the link between instructors' learning abilities and I.C.T. knowledge. A self-developed Learning Skills Scale and an I.C.T. Awareness Scale were used to gather data for the investigation. The researchers used a stratified random sampling method to choose the sample. A total of 242 aspiring B.Ed. Teachers were engaged in the Research. The data were analyzed with the t-test and Pearson's product-moment correlation coefficients. I.C.T. awareness has no statistically significant correlation with B.Ed. instructors' learning ability, according to the findings 8.23–8:24

I conducted a study in Kapil Gandhar, Anu Sharma, Sameer Sharma, and Seema (2011) to better understand how technology affects the teaching and learning process. I.C.T. has improved the teaching-learning process by making it possible for students to learn at their speed using various resources such as assignments, computers, and more. E-mail, chalk sessions, e-learning, web-based learning, such as the Internet, intranet, extranet, CD-ROM, and television audio-video tape, keep students informed and enhance teachers' ability and competency. Since its inception, Edusat technology has evolved into an extremely effective medium for bringing together specialists and students in an interactive setting. These emerging technologies (E.L.T.) have made important breakthroughs in the teaching and learning processes, including blogging and Integrated Learning Modules. (9): 1–5.

D. Passey, C. Rogers, J. Machell, G. McHugh, and D. Allaway (2004). For the DFES, I conducted a study on the "motivational effect of I.C.T. on students." One hundred and seventy-seven schools from throughout the U.K. were chosen as a representative sample. Research shows that I.C.T. has a positive effect on motivation, particularly involvement, Research, writing/editing/presentation, and editing. Many students thought that using the Internet, interactive whiteboards, writing and publishing software, and presentation software would be helpful. I.C.T. had a positive impact on students' attitudes about homework and their behavior in the classroom. There are 39, pp. 104–107.

A. Goldberg, M. Russell & A. Cook (2003), A meta-analysis of studies conducted between 1992 and 2002 examined "the effect of computers on student writing." A study of 26 studies published between 1992 and 2002 that compared children's writing on paper and pencil with writing on computers was conducted by U.S. academics. According to this study, computers had a substantial mean effect size on both quantity and quality of writing produced. According to the researchers, students who learn to write on computers are more engaged and driven than those who do it on paper and pencil, who also found that the writing process in computer classrooms is more collaborative, interactive, and social. (532-537). A total of (26: 532-237).

2.4 CONCLUSIONS

The preceding Research will demonstrate the problem's sincerity. Additionally, these investigations provide insight into what has been accomplished, discovered, and accepted. The associated studies provided valuable insight on selecting the problem and focusing on the study's aims and objectives. It also assisted the researcher in developing a clear understanding of the methodology that could be used, including sample selection and size, data collection tools, data collection techniques, statistical techniques for data analysis, data interpretation, data discussion, and conclusion formulation.

In summary, the assessment of linked literature supplied the researcher with the following insights and ideas for making the Research more meaningful and practical.

1. Allows for familiarity with what is yet unknown and unproven.
2. Provided context for the research project and recommended an effective study design.
3. Contributed to the accurate definition of the problem.
4. Provided tips for developing hypotheses.
5. Allows for knowledge about accessible and promising data collection equipment and instructions for developing scales.

6. The stated conflicting and contradictory findings aided in refining the understanding of the topic and provided appropriate recommendations for conducting the investigation systematically.

The researcher discussed the significance of reviewing related literature, including reviews on I.C.T. awareness, attitude toward I.C.T., and learning skills in I.C.T. for B.Ed trainees.

In the next chapter, the researcher has presented the methodology followed in the study, including a method of Research, sampling procedure, tools used for data collection, and statistical techniques used for analyzing the data.

CHAPTER 3

METHODOLOGY

CHAPTER 3

METHODOLOGY

3.1 INTRODUCTION

The previous chapter reviewed related literature on ICT awareness, attitude toward ICT, and ICT skill acquisition. The current chapter discusses the researcher's methods. It describes the study methodology, the sampling procedure, the instruments, and the statistical techniques used to analyze data.

3.2 RESEARCH METHOD

The descriptive correlation method was applied in this investigation. The link between two or more variables was explored, precisely the extent to which variation in one variable is connected with variation in other variables. Correlation analysis is used to ascertain the relationships between two or more variables. Data are acquired from numerous variables and then analyzed using correlational statistical approaches. The significant factors are selected, and the relationships between them are studied. The correlational study examines various elements, including the nature of the link between two or more variables; nevertheless, correlation does not imply causality. Thus, correlational research enables the researcher to make only rudimentary causal inferences.

3.2.1 THE OBJECTIVE OF CORRELATION STUDIES

As with casual-comparative research, the goal of these studies is to ascertain relationships between variables. However, while the other methods provide information on the existence of a relationship, whether it exists or not, correlational studies go a step further and provide information about how strong the relationship is.

3.2.2 CONCERNS RELATED TO CORRELATIONAL STUDIES

A score correlation coefficient ranging between -1 and +1 indicates the strength of the association between two variables. Correlation coefficients are calculated statistically using measurement data from each variable. A high correlation value suggests a proportionate or aligned link, whereas a negative correlation coefficient shows an underlying inverse relationship. The correlation coefficient value of O indicated no association between the variables. The greater the correlation coefficient in either direction, the stronger the association between variables.

For instance, there is a positive link between IQ factors and academic accomplishment. This means that a high IQ is associated with a high level of learning achievement; in other words, there are parallels between IQ and academic achievement. On the other hand, a negative correlation shows that a low value for another follows a high value for one variable. For instance, there is a negative association between absenteeism and academic achievement; this suggests that excessive absenteeism is associated with low academic achievement; in other words, there are inequalities between absenteeism and academic achievement.

Correlation studies employ statistical techniques to ascertain correlation coefficients. These are used to investigate more complex relationships, such as predictive and those that include multivariate analysis.

Correlational studies have a significant drawback in that they do not reveal the cause and effect relationship. No causal relationship can be established based on the type of relationship identified between the variables. This distinguishes correlational studies from experimental studies.

3.2.3 CORRELATIONAL RESEARCH CHARACTERISTICS

- The research is appropriate if the factors are complex or cannot be investigated experimentally, and cannot be changed.
- The research permits the quantification of specific variables and their relationships, advancing our understanding of the real world.

- The research output is a level or the upper and lower bounds of a relationship, not its presence or absence.
- Certain variables may be predicted by the research based on the independent variable.

3.3. SAMPLING

Additionally, the researcher selected the sample using the stratified random sampling technique, as suggested by the instructions. The sample consisted of 400 B.Ed trainees enrolled in the second year of B.Ed programs at Chatrapati Sahu Ji Maharaj University Kanpur. This is a correlative study; the investigator randomly picked four aided and six unaided B.Ed colleges from a pool of 32. The sample consisted of 400 pupils, as illustrated below.

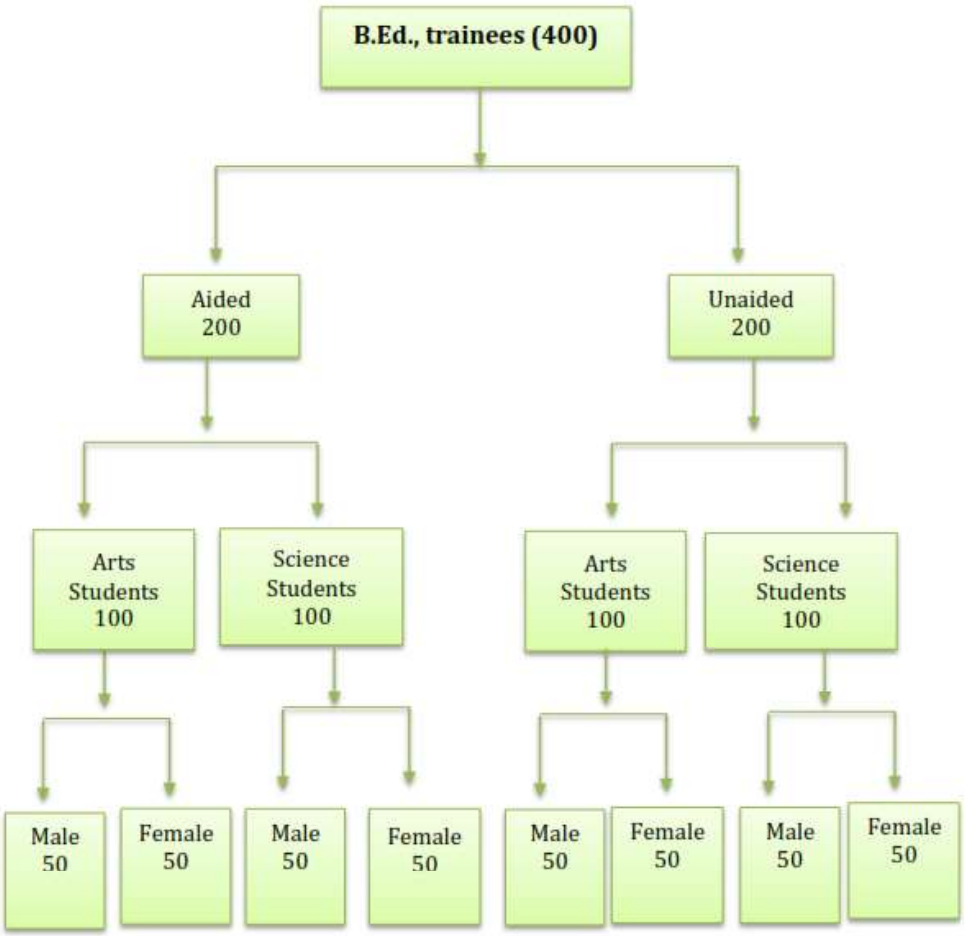


Figure 3.1 The number of B.Ed trainees selected for the study at Chatrapati Sahu Ji Maharaj University Kanpur is depicted.

AIDED COLLEGES

1. CHAUDHARY CHARAN SINGH DEGREE COLLEGE VILL. PO-HEONRA,

ETAWAH

2. AKBARPUR MAHAVIDYALAYA, AKBARPUR, KANPUR DEHAT

3. TILAK MAHAVIDYALYA, OLD NUMAISH ROAD SANJAY GATE AURAIYA,

4. ACHARYA NARENDRA DEV NAGAR NIGAM MAHILA MAHAVIDYALAYA

111/478 HARSH NAGAR, KANPUR-208012

UNAIDED COLLEGES

1. ABHAYVEER SMRITI MAHAVIDYALYA, UDI, ETWAH

2. CH. NATTHU SINGH MAHAVIDHYALAYA, SAHSARPUR, KUMHAWAR, ETAWAH

3. CH. SUGHAR SINGH EDUCATIONAL ACADEMY, KACHAURA RAOD, RAILMANDI, JAWANT NAGAR, ETAWAH

4. K.K. P.G. COLLEGE ETAWAH, NEAR PAKKA TALAB, ETAWAH,

5. VIVEKANAND INSTITUTE OF MANAGEMENT & TECHNOLOGY, ALAMPUR HAUZ AGRA ROAD, ETAWAH,

6. SIR MADANLAL INSTITUTE OF EDUCATION, ALAMPUR HAUZ AGRA ROAD ETAWAH,

The researcher utilized the following tools to collect data in this investigation.

ICT awareness tool – The researcher constructs and standardizes.

Attitude towards ICT – J Samuel Gnanamuthu and R Krishnakumar devised this.

Learning skills in ICT – The researcher created and standardized the data.

3.4 TOOLS USED FOR COLLECTION OF DATA

3.4.1 CONSTRUCTION OF THE TOOL FOR ICT AWARENESS

Awareness of information and communication technology includes educational radio, television, the internet, computer-based programs, CD-ROMs, computer-aided/assisted instruction, web-based learning, multimedia, teleconferencing, video conferencing, virtual reality internal tutoring systems, and e-learning and e-content. Awareness of ICT is critical for assisting B.Ed. Students in learning and achieving success in their teaching pedagogical subjects. It is to understand computer and internet components, such as how they work, and aid in problem-solving when educating. This can be accomplished by examining photographs, written reports, and assignments. It develops an awareness of what information and communication technologies (ICTs) are, how they work, and the role and influence of ICTs in the teaching-learning process in the classroom. The researcher sought to gather significant insight into the ICT knowledge of B.Ed students to develop an ICT awareness tool.

The researcher consulted the following sources: books, journals, special journals, scholarly articles, and dissertations. Finally, with the guide's guidance, the researcher gained a clear understanding of how to develop an ICT awareness tool.

The tool involves the awareness of the following ICT components

- Computer.

- Internet.
- Software and HardWare.
- Tele-Communication.
- Educational-Radio.
- Educational-Television.
- Computer-Assisted Learning
- Video Conference.
- M-Learning
- E-Learning.

The following steps were followed in constructing the tool.

1. Planning the test
2. Preparing the test
3. Trying out the test
4. Item analysis in terms of (a) Difficulty Index and

(b) Discrimination indices.

5. Finalization of items based on item analysis.
6. Evaluation of the test

The steps mentioned above are described in detail in the following pages.

1. Planning the Test

Any tool preparation requires meticulous planning. The first and most critical stage in planning a test is defining the objectives to be measured. The problem is relatively straightforward if the aims and outputs are well defined and readily identifiable.

The objectives of an ICT awareness tool may fall into a variety of areas, including factual knowledge, comprehension, and application. The learning outcomes can be assessed using both essay-style and objective-style questions. However, the investigator picked objective-type questions, particularly multiple-choice questions, for the test due to their objectivity. Multiple-choice questions were used to assess the objective type of learning outcomes of increased knowledge, comprehension, and application.

The development of an ICT awareness tool is becoming increasingly dependent on curricular validity; the outline of content is critical since the content is the vehicle by which the objectives are to be accomplished. Thus, the test should cover all or a substantial amount of the syllabus's various themes. The present test, in particular, was designed to cover the entire syllabus for B.Ed courses offered by several universities.

The researcher consulted specialists from several colleges and question banks to create question banks based on the new syllabus. The items have been chosen to represent a representative sample of the entire unit. Their value and effectiveness are determined not only by their suitability for inclusion in the curriculum and their difficulty but also by their ability to discriminate between pupils with high and low levels of general achievement.

2 . Preparing the test – pooling and writing of Items

After developing the test's design, items were pooled and written using textbooks, reference books, question papers, and question banks prepared by various writers. Multiple-choice items were created because they are considered the most valuable and widely applicable test format. The Draft Test comprises 80 items, 60 of which were gathered from various sources and 20 of which were created by the researcher.

Examined by evaluation experts and a guide, essential changes were made to some items in light of their suggestions. Thus, a draught contains 60 items for testing. Specific instructions for administering the test, including a time limit,

were produced. A preliminary test worth 60 points was also prepared. The ICT awareness tool was developed with specialists and compliance with established test construction procedures.

3 . Trying out the test

After the test had been created according to plan, it was time to give it a real-world trial. Because it is hard to tell in advance how good the test is or to identify the weaker elements, the try-out should be considered one of the critical vital processes in developing the final tool.

The experimental try-out aims to obtain data concerning the following.

- The degree of difficulty associated with each test item.
- Each test item's discriminating power.
- Each distractor's effectiveness for each multiple-choice test item.
- The direction's suitability, the time constraints, and the test structure.

The final draught was tested on a random sample of 100 students enrolled in a B.Ed course at Badaun's B,Ed colleges. The pupils took around 60 minutes to complete the test.

4 . Item Analysis

The test was administered to 100 B.Ed trainees and their answer books were scored, as well as a master chart containing item-by-item and overall marks. The scores were organized in descending order to calculate item difficulty and discrimination indices. The answer sheets were classified into high, average, and low. The top 27% of answer papers were assigned to the high group, the bottom 27% to the low group, and the remaining 46% to the average group.

The number of answer sheets in both extreme groups equaled the total number of papers (the average group was set aside for item analysis, while the papers from the other two groups (high and low) were used.

a) Index of Difficulty:

The difficulty index is defined as the proportion of the group that correctly answered the item. The greater the index value, the simpler the object.

The numerical value of a test item's difficulty index is purely decided by its content. It also reflects the group's capacity to respond to the item. The following formula was used to determine the difficulty index:

$$d = \frac{nH + nL}{nT} \times 100$$

Where,

d = Index of item difficulty

n_H = number of students who answered the item correctly in the higher group

n_L = number of students who answered the item correctly in the lower group.

n_T = Total number of students taking the test

b) Index of Discrimination

The discrimination strength of the items indicates their ability to differentiate between pupils of varying levels of achievement. If a question does not meet this standard, it is not included in the test. Suppose a question or item on a test is solved equally or nearly equally by students at higher and lower levels. In that case, its discriminating power is zero, and it is not evaluated for inclusion in the exam.

The following formula was used in the current investigation to determine the discriminating power of the test items:

$$D = \frac{nH - nL}{nt}$$

D = Discrimination Index

n_H = number of students answered the item correctly in higher group

n_L = number of students answered the item correctly in lower group

n_T = Number of students in high or low group

Question no	Discrimination Index (D)	Difficult Index (d)	Retained / Rejected
1	0	59.25	Rejected
2	0.33	38.88	Retained
3	0.37	44.44	Retained
4	0.29	66.66	Retained
5	0.66	44.44	Retained
6	0.14	66.66	Rejected
7	0.40	72.22	Retained
8	0.77	53.7	Retained
9	0.14	44.44	Rejected
10	0.25	79.62	Retained
11	0.11	16.66	Rejected
12	0.25	42.59	Retained
13	0.37	77.77	Retained
14	0.07	51.85	Rejected
15	0.55	42.59	Retained
16	0.59	70.37	Retained

Question no	Discrimination Index (D)	Difficult Index (d)	Retained / Rejected
17	0.22	59.25	Rejected
18	0.25	64.81	Retained
19	0.03	31.48	Rejected
20	0.14	18.51	Rejected
21	0.25	64.81	Retained
22	0.37	22.22	Retained
23	0.11	27.77	Rejected
24	0.66	51.85	Retained
25	0.11	42.59	Rejected
26	0.37	40.74	Retained
27	0.37	70.37	Retained
28	0.40	46.29	Retained
29	0.25	14.81	Retained
30	0.07	3.70	Rejected
31	0.37	55.55	Retained
32	0.03	12.96	Rejected
33	0.29	44.44	Retained
34	0	37.00	Rejected
35	0.25	57.40	Retained
36	0.48	42.59	Retained
37	0.29	59.25	Retained
38	0	22.22	Rejected
39	0.40	50.00	Retained
40	0.11	31.48	Rejected
41	0.03	16.66	Rejected

Question no	Discrimination Index (D)	Difficult Index (d)	Retained / Rejected
42	0.25	29.62	Retained
43	0.48	35.18	Retained
44	0.25	72.22	Retained
45	0.44	37.03	Retained
46	0.03	53.70	Rejected
47	0.33	83.33	Retained
48	0.25	42.59	Retained
49	0.14	14.81	Rejected
50	0.03	12.96	Rejected
51	0.29	70.37	Retained
52	0.59	75.92	Retained
53	0.40	42.59	Retained
54	0.59	51.85	Retained
55	0.44	48.14	Retained
56	0.29	22.22	Retained
57	0.11	90.74	Rejected
58	0.59	51.85	Retained
59	0.40	68.51	Retained
60	0.25	42.59	Retained

5. FINALISATION OF ITEMS BASED ON ITEM ANALYSIS:

Individual test items are assigned an item difficulty index and item discrimination coefficients. As a result of these two analyses, the following items were deleted: b1,6,9,11,14,17,19,20,23,25,30,32,34,38,40,41,46,49,50, and 57. The final 40 items comprised the test. Additionally, items that were deemed excessively simple or too challenging and those with coefficients less than 0.25 were

eliminated. The final test problems were arranged according to their difficulty level.

6. EVALUATION OF ICT AWARENESS TOOL.

The final test was reviewed based on its reliability and validity.

Reliability of the Test

The dependability of a test refers to its capacity to produce consistent results across multiple sets of measures. It is a term that relates to the degree to which a measuring device produces consistent results when used. The reliability of consistency was calculated using the split-half method and found to be 0.75 (n=100).

Validity of the Test

A test is valid if it tests what it purports to measure or must measure the objective or some component of it. It is always about the test's goal.

The test's content validity was evaluated regarding material coverage and instructional objectives.

The test has content validity, as it covers all sections of the ICT curriculum; also, the test was administered to five topic specialists.

ICT instruction in the first year of the B.Ed. According to trainees, the test also has content validity.

3.4.2 B.ED TRAINEES ATTITUDE TOWARDS ICT : (J. Samuel Gnanamuthu and R.Krishna Kumar)

While J. Samuel Gnanamuthu and R. Krishna Kumar constructed a tool, they created a draught scale consisting of 34 statements. Twenty of the 34 remarks were positive, while fourteen were negative. The tool responded on a five-point Likert scale, ranging from strongly agree to agree, undecided, disagree, and

strongly disagree. The replies were weighted 5 for highly agree, 4 for agree, 3 for unsure, 2 for disagree, and 1 for severely disagree. The weightings were maintained in reverse order for positive and negative statements. Additionally, the "t value was determined to determine the relevance of the test items. The "t" value for statements that exceed the table value at the 0.50 level has been considered.

The final tool's statements were developed using statistical procedures, including Cronbach's alpha values ranging from 0.789 to 0.994, Kolmogorov Smirnov values ranging from 1.927 to 4.532, and "t" values ranging from 4.09 to 12.11. Twenty-four statements were judged to be statistically valid. The final version of the tool, named "B.Ed. students' Attitude toward ICT," contains twenty statements. The twenty assertions cover five dimensions: avoidance/acceptance, classroom learning, and negative impact on learning. The tool utilizes a five-point scale with a maximum of 100 points and a minimum of 20 points.

3.4.3 CONSTRUCTION OF LEARNING SKILLS IN ICT TOOL

The researcher consulted the following sources: books, journals, special journals, scholarly articles, and dissertations. Finally, with the guide's guidance, the researcher gained a clear understanding of how to design an ICT skill-learning tool.

Learning skills in the ICT tool involves the following ICT components

- Computer.
- Internet.
- Software and HardWare.
- Tele-Communication.
- Computer-Assisted Learning
- M-Learning
- E-Learning.

The following steps were followed in constructing the tool.

1. Planning the test
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4. Item analysis in terms of (a) Difficulty Index and
   (b) Discrimination indices.
5. Finalization of items based on item analysis.
6. Evaluation of the test

The steps mentioned above are described in detail in the following pages.

1. Planning the test

Any tool requires meticulous planning before it can be constructed. The first and most critical stage in developing a test is defining the objectives to be measured. The problem is relatively straightforward if the aims and outputs are well defined and easily identifiable.

The aims of ICT tool skill acquisition may fall into various areas, including factual information, comprehension, and application. The learning outcomes can be assessed using both essay-style and objective-style questions. However, the investigator picked objective-type questions, particularly multiple-choice questions, for the test due to their objectivity. Multiple-choice questions were used to assess the objective type of learning outcomes of increased knowledge, comprehension, and application.

The construction of a learning skill in an ICT tool is increasingly dependent on curricular validity; therefore, an outline of the content is critical, as the content is the vehicle through which the objectives are to be accomplished. Thus, the

test should cover all or a substantial amount of the syllabus's various themes. The present test, in particular, was designed to cover the entire syllabus for B.Ed courses offered by several universities.

The researcher consulted specialists from several universities and question banks to create question banks based on the new syllabus. The items have been chosen to represent a representative sample of the entire unit. Their value and effectiveness are determined not only by their suitability for inclusion in the curriculum and their difficulty but also by their ability to discriminate between pupils with high and low levels of general achievement.

2. Preparing the test – pooling and writing of Items

After developing the test's design, items were pooled and written using textbooks, reference books, question papers, and question banks prepared by various writers. Multiple-choice items were created because they are considered the most valuable and widely applicable test format. The Draft Test consists of 55 items, 30 of which were gathered from various sources and 25 of which were created by the researcher.

Examined by evaluation experts and a guide, essential changes were made to some items in light of their suggestions. Thus, a draught contains forty things for testing. Specific instructions for administering the test, including a time limit, were produced. A preliminary test worth 40 points was also prepared. The tool for developing ICT skills was designed with specialists and compliance with established test construction techniques.

3. Trying out the test

After the test had been created according to plan, it was time to give it a real-world trial. Because it is hard to tell in advance how good the test is or to identify the weaker elements, the try-out should be considered one of the critical vital processes in developing the final tool.

The purpose of the experimental try out is to obtain data concerning the following:

1. The difficulty of each test item.
2. The discriminating power of each test item.
3. The effectiveness of each distracter for each multiple-choice test item.
4. The adequacy of the directions, the time limits, and the test format.

The final draught was tested on a random sample of 100 students enrolled in a B,Ed course at Badaun's B,Ed colleges. The pupils took around 40 minutes to complete the test.

4. Item Analysis

The test was administered to 100 B.Ed trainees and their answer books were scored, as well as a master chart containing item-by-item and overall marks. The scores were organized in descending order to calculate item difficulty and discrimination indices. The answer sheets were classified into high, average, and low. The top 27% of answer papers were assigned to the high group, the bottom 27% to the low group, and the remaining 46% to the average group.

The number of answer sheets in both extreme groups equaled the total number of papers (the average group was set aside for item analysis, while the papers from the other two groups (high and low) were used.

a) Index of Difficulty

The difficulty index is defined as the proportion of the group that correctly answered the item. The greater the index value, the simpler the object. The numerical value of a test item's difficulty index is purely decided by its content. It also reflects the group's capacity to respond to the item. The following formula was used to determine the difficulty index:

$$d = \frac{nH + nL}{nT} \times 100$$

Where,

d = Index of item difficulty

n_H = number of students answered the item correctly in higher group

n_L = number of students answered the item correctly in lower group.

n_T = Total number of students taken the test (High + Low group)

b) Index of Discrimination

The discrimination strength of the items indicates their ability to differentiate between pupils of varying levels of achievement. If a question does not meet this standard, it is not included in the test. Suppose a question or item on a test is solved equally or nearly equally by students at higher and lower levels. In that case, its discriminating power is zero, and it is not evaluated for inclusion in the exam. The following formula was utilized in the current investigation to determine the discriminatory power of the test items.

$$D = \frac{nH - nL}{nt}$$

D = Discrimination Index

n_H = number of students answered the item correctly in higher group

n_L = number of students answered the item correctly in lower group

n_T = Number of students in high or low group

Question No	Discrimination Index (D)	Difficult Index (d)	Retained / Rejected
1	0	66.66	Rejected
2	0.18	46.29	Rejected
3	0.33	72.22	Retained
4	0.11	24.01	Rejected
5	0.59	40.74	Retained
6	0.25	64.81	Retained
7	0.55	64.81	Retained
8	0.14	29.62	Rejected
9	0.48	61.11	Retained
10	0.81	55.55	Retained
11	0.48	57.40	Retained
12	0.25	42.59	Retained
13	0.07	18.51	Rejected
14	0.07	51.85	Rejected
15	0.33	57.40	Retained
16	0.66	48.14	Retained
17	0.18	24.01	Rejected
18	0.03	24.01	Rejected
19	0.33	38.88	Retained
20	0.40	68.51	Retained
21	0.55	57.40	Retained
22	0.37	40.74	Retained
23	0.33	42.59	Retained
24	0.48	75.92	Retained

Question No	Discrimination Index (D)	Difficult Index (d)	Retained / Rejected
25	0.33	38.88	Retained
26	0.55	38.88	Retained
27	0.55	53.70	Retained
28	0.37	40.74	Retained
29	0.25	50.00	Retained
30	0.29	33.33	Retained
31	0.66	62.96	Retained
32	0.51	62.96	Retained
33	0.66	51.85	Retained
34	0.48	46.29	Retained
35	0.44	48.14	Retained
36	0.48	50.00	Retained
37	0.37	51.85	Retained
38	0.51	48.14	Retained
39	0.25	31.48	Retained
40	0.55	35.18	Retained

5. Finalisation of items based on item analysis

Individual test items are assigned an item difficulty index and item discrimination coefficients. The entries numbered 1, 2, 4, 8, 13, 14, 17, and 18 were removed due to these two analyses. The final test consisted of the remaining 32 items. Additionally, items that were deemed excessively simple or too challenging and those with coefficients less than 0.25 were eliminated. The final test items were arranged according to their difficulty level.

6. Evaluation of learning skills in ICT tool.

The final test was reviewed based on its reliability and validity.

Reliability of the Test

The dependability of a test refers to its capacity to produce consistent results across multiple sets of measures. It is a term that relates to the degree to which a measuring device produces consistent results when used. The reliability of consistency was calculated using the split-half method and found to be 0.69 (n=100).

Validity of the Test

A test is valid if it tests what it purports to measure or must measure the objective or some component of it. It is always about the test's goal.

The test's content validity was evaluated regarding material coverage and instructional objectives.

The test has content validity, as it covers all sections of the ICT curriculum; also, the test was administered to five topic specialists. ICT instruction in the first year of the B.Ed. According to trainees, the test also has content validity.

3.5 COLLECTION OF DATA

Additionally, the researcher has planned to collect data for the study based on the guide's advice. The researcher visited colleges and obtained permission from principals to gather data. This data set was compiled from aided and unaided colleges and comprises arts and science teacher trainees (male and female).

3.5.1 ADMINISTERED ICT AWARENESS TOOL

The researcher administered the researcher-developed and standardized ICT awareness tool. Each student was given the tool and instructed to read the instructions at the beginning of the booklet and express their free and candid opinion by entering the response a/b/c/d in the provided box next to each sentence. The tool was specified to take 40 minutes to finish.

3.5.2 ADMINISTERED SCALE TO MEASURE ATTITUDE TOWARDS ICT

The researcher administered the attitude toward ICT measure that J Samuel Gnanamuthu and R Krishnakumar developed and standardized. Each student was given the tool and instructed to read the instructions at the beginning of the booklet and express their free and candid opinion by inserting a check () next to the sentences under the column they believe the most appropriate options are. DA, SDA, SA, A, UD, DA, UD A time limit of 20 minutes was imposed to complete the scale.

3.5.3 ADMINISTERED LEARNING SKILLS IN ICT TOOL

The researcher administered the learning skill using an ICT tool that the researcher developed and standardized. Each student was given the tool and instructed to read the instructions at the beginning of the booklet before providing their free and candid opinion by placing a () mark within the parenthesis. The tool was specified to take 30 minutes to finish.

3.6 STATISTICAL TECHNIQUES USED FOR THE ANALYSIS OF DATA

The investigator gathered the data then statistically analyzed it using the SPSS 20.0 software package.

- The t-test was employed to determine the difference in mean between the two groups.
- A two-way ANOVA was performed to determine the interaction effect of independent variables on the dependent variable. Two-factor analysis of variance was used to compare distinct groups, followed by Tukey's multiple posthoc methods.
- The relationship between the independent and dependent variables was determined using correlation analysis.
- Multiple regression analysis was done to determine how independent variables influenced the dependent variable.

CHAPTER 4

ANALYSIS AND INTERPRETATION OF THE DATA

CHAPTER 4

ANALYSIS AND INTERPRETATION OF THE DATA

4.1 INTRODUCTION

The appropriate statistical tools have been used in this chapter to analyze the data collected on B.Ed. Trainees' learning skills in ICT, awareness of ICT, and attitude toward ICT, including summary statistics such as mean and SD; inferential analysis such as two-factor analysis of variance followed by Tukey's multiple posthoc procedures; and multivariate statistical methods such as correlation and multiple regression analysis, all of which were conducted using the SPSS 20.00 statistical software.

The first section of this analysis and interpretation contains a description of the profile. In contrast, the second section has an inferential analysis of the multivariate impact of ICT knowledge and attitude toward ICT on gaining ICT skills among B.Ed. Trainees. The broad categories of analysis of B. Ed. trainees' learning skills in ICT include two-factor analysis of variance followed by Tukey's multiple posthoc procedures for factor comparisons, correlation analysis for relationship analysis, and multiple regression analysis to determine the influence of independent variables on the dependent variable. It is accompanied by interpretations and brief explanations that aid in comprehending the findings and observations. Numerous statistical tools are beneficial in analyzing and establishing the connected variables.

Additionally, the researcher wishes to determine whether there are differences in moderate variables such as management style (aided and unaided), degree (arts and science), and gender (male and female) in terms of awareness of and attitude toward ICT on the learning of ICT skills by B.Ed. Trainees and, consequently, others.

The following sections of Chapter 4 of the research are relevant for this purpose:

Statistics in summary.

Inferential statistics examine the interaction effects of moderate variables such as ICT awareness and attitude toward ICT on B.Ed. Trainees' acquisition of ICT skills.

Correlation investigation of B.Ed. Trainees' ICT learning skills with other independent factors.

Multiple linear regression examination of B.Ed. Trainees' ICT learning skills in conjunction with other independent factors.

4.2 STATISTICS IN SUMMARY

In this section, the researcher offered summary statistics on ICT awareness and attitude toward ICT on developing ICT skills by B. Ed. trainees. The statistics were broken down by kind of management (aided and unaided), degree (Arts and Science), and gender (male and female). Additionally, the following section presents the mean and standard deviation of B. Ed. trainees' learning skills in ICT according to their level of awareness of ICT and attitude toward ICT.

Table - 4.1

Mean and standard deviation of learning skills in ICT, awareness and attitude towards ICT of B.Ed. trainees according to types of management

Variables	Summary	Aided	Unaided	Total
	n	200	200	400
Learning skills in ICT	Mean ± SD	14.94±3.55	15.26±3.80	15.10±3.68
Awareness of ICT	Mean ± SD	19.79±5.74	18.76±5.77	19.27±5.76
Attitude of ICT	Mean ± SD	59.99±15.16	60.91±12.66	60.45±13.9

The above table summarizes the mean and standard deviation of B.Ed. According to management style, trainees' ICT learning skills, awareness of, and attitude toward ICT. It made it quite clear:

The total mean of B.Ed. Trainees' learning skills in ICT scores is 15.103.68, with trainees from aided B.Ed. Colleges (14.943.55) have slightly lower learning skills in ICT scores than trainees from unaided B.Ed. Colleges (15.263.80).

The total mean awareness of ICT scores among B.Ed. Trainees are 19.275.76, with assisted B.Ed. Trainees (19.795.74) having slightly greater awareness of ICT scores than unaided B.Ed. Trainees (18.765.77).

The overall mean attitude toward ICT scores of B.Ed. Trainees are 60.4513.96, with trainees from aided B.Ed. Schools (59.9915.16) had a little more negative attitude toward ICT scores than trainees from unaided B.Ed. Colleges (60.9112.66).

Table – 4.2

Mean and standard deviation of learning skills in ICT, awareness and attitude towards ICT according to arts and science graduates of B.Ed. trainees.

Variables	Summary	Arts	Science	Total
	n	200	200	400
Learning skills in ICT	Mean ± SD	14.08±3.16	16.12±3.88	15.10±3.68
Awareness of ICT	Mean ± SD	17.73±5.54	20.82±5.60	19.27±5.77
Attitude towards ICT	Mean ± SD	56.91±13.59	63.99±13.44	60.45±13.96

The preceding table summarizes the mean and standard deviation of ICT-related learning skills, awareness of ICT, and attitude toward ICT among arts and science graduates of B.Ed. Trainees. It made it quite plain what follows:

The total mean of B. Ed. trainees' learning skills in ICT scores is 15.103.68, with B. Ed. trainees with an arts degree (14.083.16) having lower learning skills in ICT scores than B. Ed. trainees with a scientific degree (16.123.88).

The total mean awareness of ICT scores among B.Ed. Trainees are 19.275.77, with B.Ed. Trainees with an arts degree (17.735.54) have a lower level of awareness than B.Ed. Trainees with a scientific degree (20.825.60).

The overall mean attitude against ICT results for B.Ed. Trainees are 60.4513.96, with B.Ed. Trainees with an arts degree (56.9113.59) have a more negative attitude toward ICT scores than B.Ed. Trainees with a scientific degree (63.9913.44).

Table – 4.3

Mean and standard deviation of learning skills in ICT, awareness and attitude towards ICT of male and female B.Ed. trainees

Variables	Summary	Male	Female	Total
	n	200	200	400
Learning skills in ICT	Mean ± SD	14.09±3.13	16.11±3.91	15.10±3.68
Awareness of ICT	Mean ± SD	17.94±5.42	20.61±5.82	19.27±5.77
Attitude towards ICT	Mean ± SD	57.30±14.22	63.61±12.97	60.45±13.96

The preceding table summarises male and female B's mean and standard deviation. Ed. Trainees' ICT learning skills, awareness, and attitude toward ICT. It made it quite plain what follows:

The total mean of B.Ed. Trainees' learning skills in ICT scores is 15.103.68, with male B.Ed. Trainees (14.093.13) scoring lower than female B.Ed. Trainees (16.113.91).

The overall mean awareness of ICT scores among B.Ed. Trainees are 19.275.77, with male B.Ed. Trainees (1717.945.42) have a lower level of awareness than female B.Ed. Trainees (20.615.82).

The mean attitude toward ICT scores for all B.Ed. Trainees are 60.4513.96, with male B.Ed. Trainees (57.3014.22) have a more negative attitude toward ICT scores than female B.Ed. Trainees (63.6112.97).

Table – 4.4

Mean and standard deviation of learning skills in ICT according to levels of awareness (low and high) of B.Ed. trainees

Summary	Low awareness	High awareness	Total
n	216	184	400
Mean ± SD	14.25±2.91	16.09±4.21	15.10±3.68

The above table summarizes the mean and standard deviation of ICT skill acquisition for B.Ed. Trainees with varying degrees of awareness (low and high). It was demonstrated that the total mean of B.Ed. Trainees' learning skills in ICT scores is 15.103.68, with B.Ed. Trainees with high awareness of ICT (16.094.21) have higher learning skills in ICT scores than B.Ed. Trainees with low awareness of ICT (14.252.91).

Table – 4.5

Mean and standard deviation of learning skills in ICT according to levels of attitudes (low and high) of B.Ed. trainees

Summary	Low attitude	High attitude	Total
n	165	235	400
Mean ± SD	11.90±2.18	17.34±2.72	15.10±3.68

The above table summarises the mean and standard deviation of ICT learning skills for B.Ed. Trainees with varying degrees of attitudes (low and high). It was demonstrated that the total mean of B.Ed. Trainees' learning skills in ICT scores is 15.103.68, with B.Ed. Trainees with a positive attitude toward ICT (17.342.72) have higher learning skills in ICT scores than B.Ed. Trainees with a negative attitude toward ICT (11.902.18).

4.3 STATISTICS OF INFERENCE

The independent t-test was used to determine the significance of differences in management styles (aided and unaided), degrees (arts and science), and gender in this section (male and female). Additionally, the researcher examined the interaction effects of ICT awareness and attitude toward ICT on the acquisition of ICT skills by B.Ed. Trainees using two-factor analysis of variance and various posthoc techniques.

Hypothesis - 1:

There is no substantial difference between aided and unassisted college B.Ed trainees in terms of ICT skills acquisition, awareness, and attitude toward ICT. The unpaired t-test was used to test the null hypothesis stated above, and the results are provided in the accompanying table.

Table – 4.6

Results of t test with mean, SD, t-value and p-value between B.Ed. trainees of aided and unaided colleges with learning skills in ICT, awareness and attitude towards ICT scores

Variable	Management	n	Mean	SD	SE	t-value	P-value
Learning skills in ICT	Aided	200	14.94	3.55	0.25	-0.8836	0.3775
	Unaided	200	15.26	3.80	0.27		
Awareness of ICT	Aided	200	19.79	5.74	0.41	1.7981	0.0729
	Unaided	200	18.76	5.77	0.41		
Attitude towards ICT	Aided	200	59.99	15.16	1.07	-0.6587	0.5104
	Unaided	200	60.91	12.66	0.90		

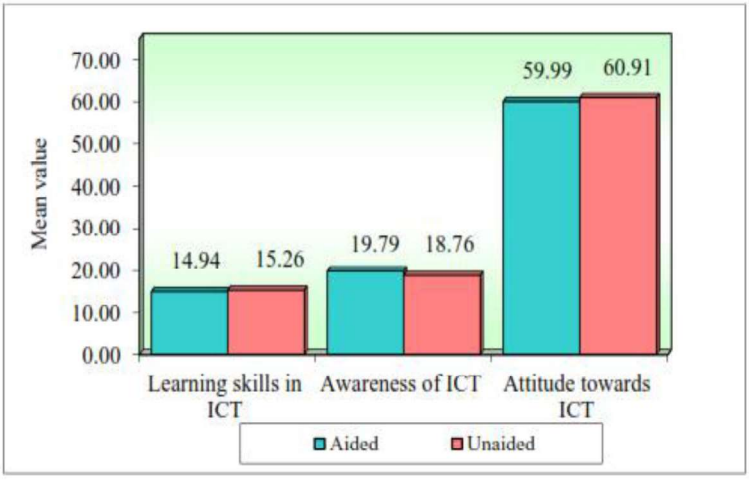
As may be observed from the results of the preceding table,

- At a 5% level of significance, the B.Ed. Trainees from aided and unaided colleges do not differ substantially in ICT learning skills (t=-0.8836, p>0.05). As a result, the null hypothesis is not rejected, but the alternative hypothesis is. This suggests that B. Ed. trainees at aided and unassisted colleges have comparable ICT scores for learning skills.

- At a 5% level of significance, the B. Ed. trainees from aided and unaided colleges do not differ substantially in their ICT awareness (t=1.7981, p>0.05). As a result, the null hypothesis is not rejected, but the alternative hypothesis is. This means that B.Ed. Students at aided and unaided colleges are equally aware of their ICT scores.

- At the 5% significance level, the attitude toward ICT of B. Ed. trainees from aided and unaided colleges is not substantially different (t=-0.6587, p>0.05). As a result, the null hypothesis is not rejected, but the alternative hypothesis is. This indicates that both aided and unaided college B. Ed. students have a comparable attitude toward ICT scores. The following figure also includes the mean and standard deviation scores.

Figure - 4.1: Comparison of B. Ed trainees of aided and unaided colleges with learning skills in ICT, Awareness and attitude towards ICT scores



Hypothesis - 2:

There is no discernible difference between arts and science-graduated B.Ed. Trainees in ICT skill acquisition, awareness, and attitude toward ICT.

The unpaired t-test was used to test the null hypothesis stated above, and the results are provided in the accompanying table.

Table – 4.7

Results of t test with mean, SD, t-value and p-value between arts and science B.Ed. trainees with respect to learning skills in ICT, awareness and attitude towards ICT

Variable	Degree	n	Mean	SD	SE	t-value	P-value
Learning skills in ICT	Arts	200	14.08	3.16	0.22	-5.7523	0.0001*
	Science	200	16.12	3.88	0.27		
Awareness of ICT	Arts	200	17.73	5.54	0.39	-5.5594	0.0001*
	Science	200	20.82	5.60	0.40		
Attitude towards ICT	Arts	200	56.91	13.59	0.96	-5.2385	0.0001*
	Science	200	63.99	13.44	0.95		

*p<0.05

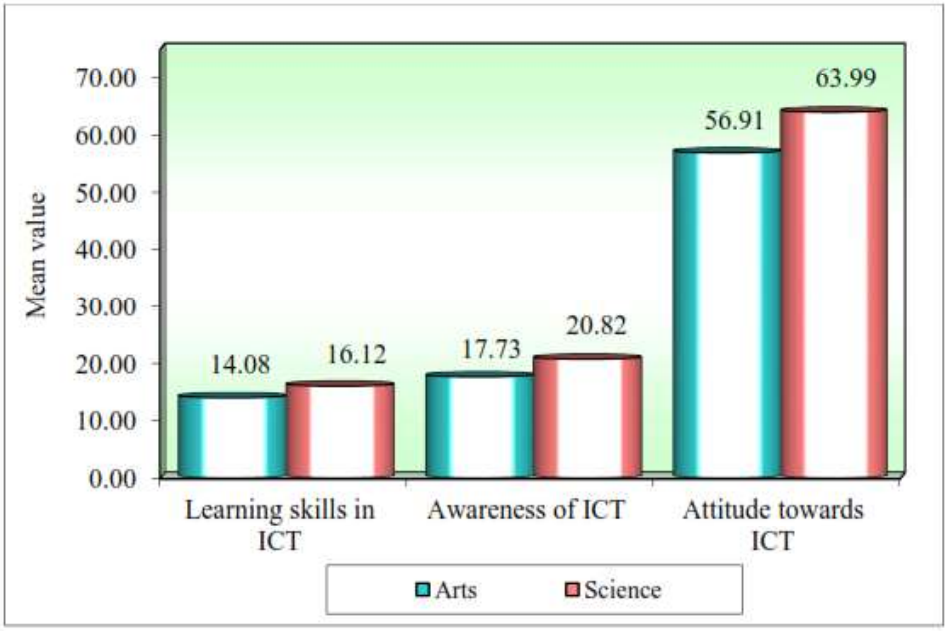
As may be observed from the results of the preceding table,

- At the 5% level of significance, B.Ed. Trainees with art or science degrees demonstrate significant differences in ICT learning skills (t=-5.7523, p0.05). As a result, the null hypothesis is rejected. This suggests that B.Ed. Trainees with a science degree have much higher ICT scores than B.Ed. trainees with an arts degree.

- At the 5% level of significance, B.Ed. Trainees with arts and scientific degrees have substantially different levels of awareness of ICT (t=-5.5594, p0.05). As a result, the null hypothesis is ruled out. This suggests that B.Ed. Students with a science degree have a significantly greater awareness of ICT scores than those with an arts degree.

- At the 5% level of significance, B.Ed. Trainees with art or science degrees had a substantially different attitude toward ICT (t=-5.2385, p0.05). As a result, the null hypothesis is ruled out. This suggests that B.Ed. Trainees with a science degree have a significantly more positive attitude toward ICT scores than B.Ed. Trainees with an art degree do. The following figure also includes the mean and standard deviation scores.

Figure - 4.2: Comparison of Arts and Science degree B. Ed trainees with learning skills in ICT, Awareness and attitude towards ICT scores



Hypothesis - 3:

There is no statistically significant difference between male and female B.Ed. Trainees in ICT skill acquisition, awareness, and attitude toward ICT.

The unpaired t-test was used to test the null hypothesis stated above, and the results are provided in the accompanying table.

Table – 4.8

Results of t test with mean, SD, t-value and p-value between male and female B.Ed. trainees with respect to learning skills in ICT, awareness and attitude towards ICT

Variable	Gender	n	Mean	SD	SE	t-value	P-value
Learning skills in ICT	Male	200	14.09	3.13	0.22	-5.6912	0.0001*
	Female	200	16.11	3.91	0.28		
Awareness of ICT	Male	200	17.94	5.42	0.38	-4.7396	0.0001*
	Female	200	20.61	5.82	0.41		
Attitude towards ICT	Male	200	57.30	14.22	1.01	-4.6360	0.0001*
	Female	200	63.61	12.97	0.92		

*p<0.05

As may be observed from the results of the preceding table,

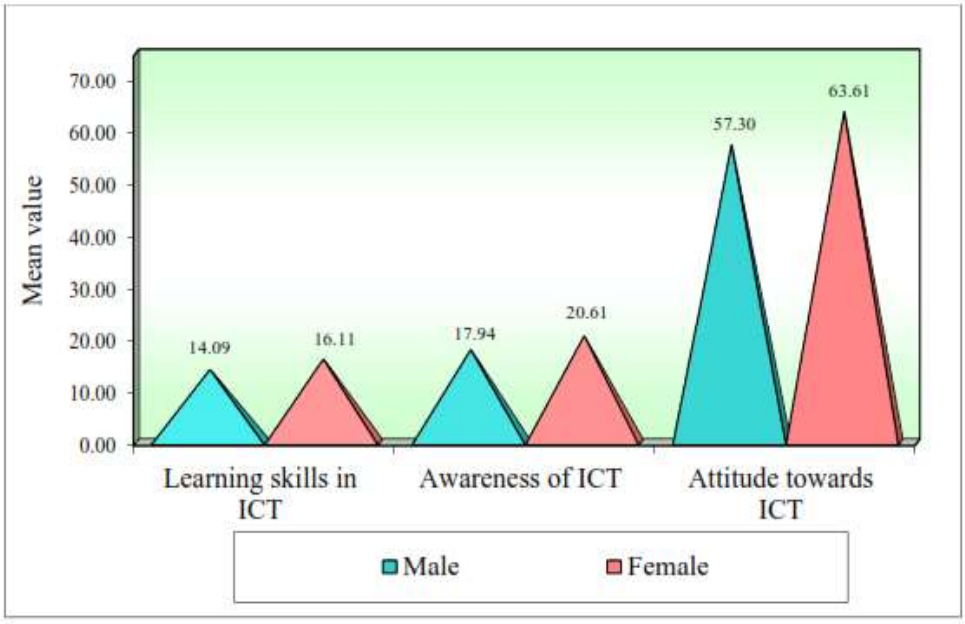
- Male and female B.Ed. Students demonstrate significant differences in ICT learning ability (t=-5.6912, p0.05) at the 5% significance level. As a result, the null hypothesis is ruled out. This suggests that female B.Ed. Students had significantly higher ICT scores than male B.Ed. students.

- Male and female B.Ed. Students differ considerably in their awareness of ICT (t=-4.7396, p0.05) at the 5% significance level. As a result, the null

hypothesis is ruled out. This suggests that female B.Ed. Students have a significantly higher knowledge of ICT scores than male B.Ed. Students.

- Male and female B.Ed. Students have substantially different attitudes about ICT (t=-4.6360, p0.05) at the 5% significance level. As a result, the null hypothesis is ruled out. This indicates that female B.Ed. Students have a significantly greater attitude regarding ICT results than male B.Ed. Students. The following figure also includes the mean and standard deviation scores.

Figure - 4.3: Comparison of male and female B. Ed trainees with learning skills in ICT, Awareness and attitude towards ICT scores



Hypothesis - 4:

There is no substantial difference between B.Ed. Trainees with low and high awareness of ICT learn ICT skills.

The unpaired t-test was used to test the null hypothesis stated above, and the results are provided in the accompanying table.

Table – 4.9

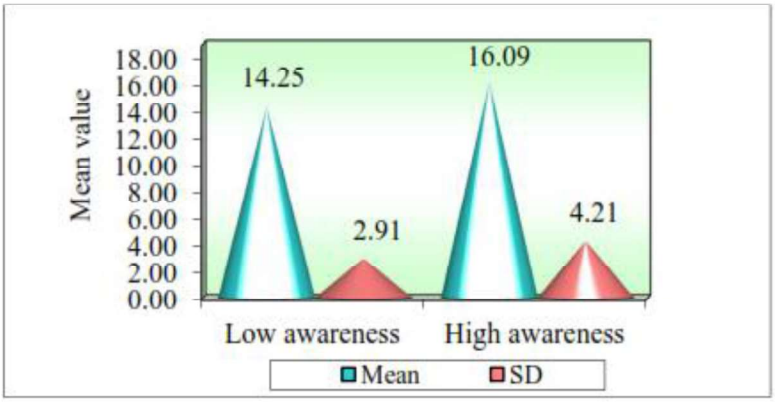
Results of t test with mean, SD, t-value and p-value between B.Ed. trainees belongs to low and high awareness of ICT with respect to learning skills in ICT

Awareness	n	Mean	SD	SE	t-value	P-value
Low awareness	216	14.25	2.91	0.20	-5.1216	0.0001*
High awareness	184	16.09	4.21	0.31		

*p<0.05

The above table indicates that at the 5% significance level, B.Ed. Trainees with low and high awareness of ICT have a significant difference in learning ICT skills (t=-5.1216, p0.05). The null hypothesis is thus ruled out. This indicates that B.Ed. Students with a high awareness of ICT demonstrate considerably superior learning abilities in ICT scores than students with a low level of awareness of ICT. The mean and standard deviation scores are included in the following figure.

Figure - 4.4: Comparison of B.Ed trainees belongs to low and high awareness of ICT with respect to learning skills in ICT



Hypothesis - 5:

There is no substantial difference between B.Ed. Trainees with a low or a high attitude toward ICT develop ICT skills.

The unpaired t-test was used to test the null hypothesis stated above, and the results are provided in the accompanying table.

Table – 4.10

Results of t test with mean, SD, t-value and p-value between B.Ed. trainees belongs to low and high attitude towards ICT with respect to learning skills in ICT

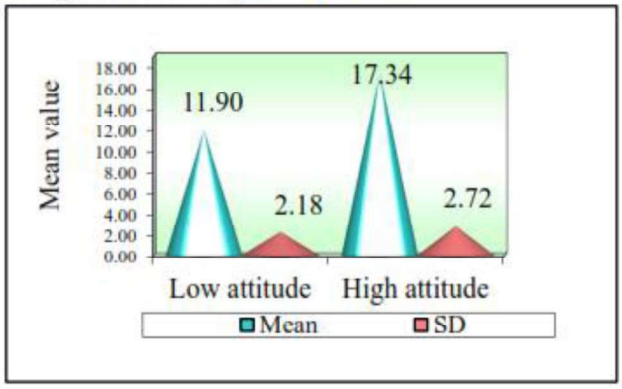
Attitude	n	Mean	SD	SE	t-value	P-value
Low attitude	165	11.90	2.18	0.17	-21.3229	0.0001*
High attitude	235	17.34	2.72	0.18		

*p<0.05

The results of the above table indicate that B.Ed. Trainees with a low or a high attitude toward ICT demonstrate a significant difference in their ability to master ICT skills (t=-21.3229, p0.05) at the 5% significance level. As a result, the null hypothesis is ruled out. This suggests that B. Ed. trainees who have a positive

attitude toward ICT have significantly greater learning skills in ICT scores than B. Ed. trainees who have a negative attitude toward ICT. The following figure also includes the mean and standard deviation scores.

Figure - 4.5: Comparison of B. Ed trainees belongs to low and high attitude towards ICT with respect to learning skills in ICT



4.3.1 STATISTICAL INFERENCE WITH INTERACTION EFFECTS

The researcher examined the interaction effects of management type, degree, and gender on the development of awareness (low and high) and attitude (low and high) of B.Ed. Trainees' ICT learning skills in this section using two-factor analysis of variance and Tukey's multiple posthoc procedures. The results are presented in the following tables.

Hypothesis - 6:

There was no significant interaction between management styles (Aided and Unaided) and levels of awareness (low and high) on the acquisition of ICT skills in B.Ed. Trainees.

The two-factor analysis of variance was used to test the null hypothesis above, and the findings are provided in the accompanying table.

Table – 4.11

Results of two factor analysis of variance of interaction effects of types of management (Aided and Unaided) and awareness (low and high) on learning skills in ICT of B.Ed. trainees

Sources of variation	Degrees of freedom	Sum of squares	Mean sum of squares	F-value	p-value
Main effects					
Managements	1	29.68	29.68	2.3544	0.1257
Awareness	1	350.82	350.82	27.8267	0.0001*
2-way interaction effects					
Managements x Awareness	1	44.96	44.96	3.5663	0.0500*
Error	396	4992.44	12.61		
Total	399	5417.90			

*p<0.05

- The primary influence of management styles (assisted and unaided) on the acquisition of ICT skills by B.Ed. Trainees are statistically insignificant (F=2.3544, p>0.05) at a 5% significance level. As a result, the null hypothesis is not rejected, but the alternative hypothesis is. This suggests that B.Ed. Trainees at aided and unassisted colleges have comparable ICT scores for learning skills.

- The primary effect of awareness (low and high) on the acquisition of ICT skills by B.Ed. Trainees are statistically significant (F=27.8267, p0.05) at the 5% significance level. As a result, H0 is rejected, whereas H1 is not. This suggests that B.Ed. Students with low and high levels of ICT knowledge have varying levels of ICT proficiency.

- The interaction effect of management style (assisted and unaided) and awareness level (low and high) on the acquisition of ICT skills by B.Ed. Trainees are statistically significant (F=3.5663, p0.05) at a 5% significance level. As a result, H0 is rejected, whereas H1 is not. This suggests that B.Ed. Students with low and high awareness of ICT in aided and unaided colleges have varying ICT learning skills.

Additionally, pairwise comparisons of the interaction effects of management styles (assisted and unaided) and awareness levels (low and high) on learning skills in ICT scores of B.Ed. Trainees were conducted using Tukey's multiple posthoc procedures, with the following results:

Table – 4.12

Pair wise comparisons of interaction effects of types of management (Aided and Unaided) and awareness (low and high) on learning skills in ICT of B.Ed. trainees by Tukeys multiple posthoc procedures

Interactions	Aided with low awareness	Aided with high awareness	Unaided with low awareness	Unaided with high awareness
Mean	14.32	15.53	14.20	16.76
SD	3.07	3.88	2.79	4.50
Aided with low awareness	-			
Aided with high awareness	p=0.0747	-		
Unaided with low awareness	p=0.9938	p=0.0283*	-	
Unaided with high awareness	p=0.0001*	p=0.0918	p=0.0001*	-

*p<0.05

As may be observed from the results of the preceding table,

- At a 5% level of significance, B.Ed. Trainees from aided colleges with low awareness and B.Ed. Trainees from aided institutions with high awareness do not differ substantially in learning skills in ICT scores. This indicates that B.Ed. Trainees at aided colleges with low awareness and B.Ed. Trainees at aided colleges with high awareness have comparable ICT scores for learning skills.

- At a 5% significance level, B.Ed. Trainees from aided colleges with low awareness and B.Ed. Trainees from unassisted colleges with low awareness do not differ substantially in learning skills in ICT scores. This suggests that B.Ed. Students in aided institutions with low awareness and B.Ed. Students in unaided

colleges with low awareness have comparable learning skills measured by ICT scores.

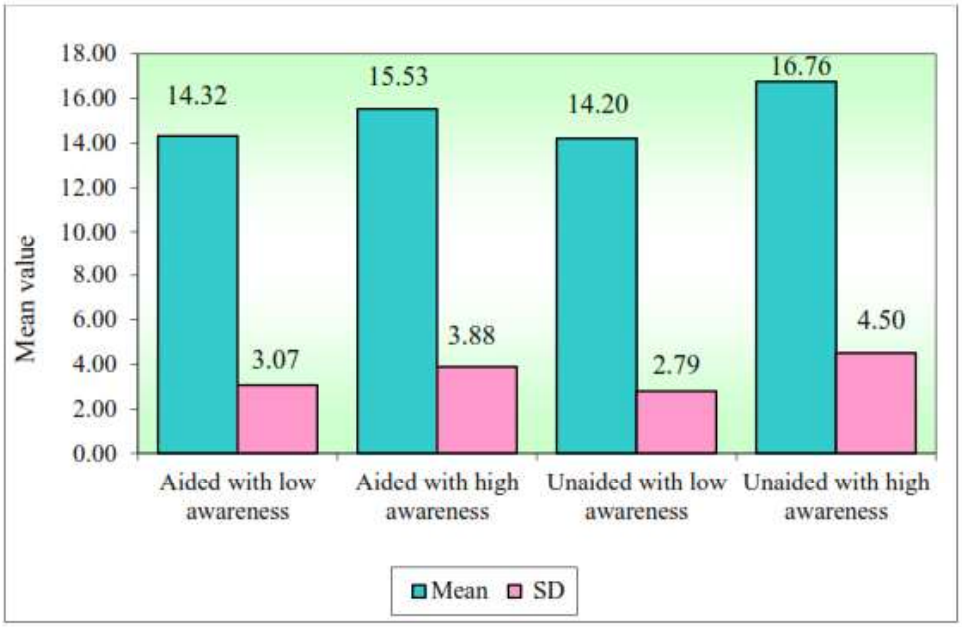
- At a 5% significance level, B.Ed. Trainees from aided institutions with low awareness and B.Ed. Trainees from unassisted colleges with high awareness differ considerably in learning skills in ICT scores. This suggests that B.Ed. Trainees at unassisted colleges with a high level of awareness had much higher ICT scores than B.Ed. Trainees at aided colleges with a low level of awareness.

- At a 5% level of significance, B.Ed. Trainees from aided colleges with high awareness and B.Ed. Trainees from unassisted colleges with poor awareness differ considerably in learning skills in ICT scores. This suggests that B.Ed. Trainees at unassisted colleges with a high level of awareness had much higher ICT scores than B.Ed. Trainees at aided colleges with a low level of awareness.

- At a 5% significance level, B.Ed. Trainees from aided colleges with high awareness and B.Ed. Trainees from unassisted colleges with high awareness do not differ substantially in learning skills in ICT scores. This suggests that B.Ed. Trainees in aided institutions with a high level of awareness and B.Ed. Trainees in unassisted colleges with a high level of awareness have comparable ICT scores for learning skills.

- At a 5% significance level, B.Ed. Trainees from unaided colleges with low awareness and B.Ed. Trainees from unaided institutions with high awareness differ considerably in learning skills in ICT scores. This suggests that B.Ed. Trainees at unassisted institutions with a high level of awareness had significantly higher ICT scores than B.Ed. Trainees at unaided colleges with a low level of awareness. The following figure also includes the mean scores.

Figure - 4.6: Comparison of interaction effects of types of management (Aided and Unaided) and awareness (low and high) on learning skills in ICT of B.Ed trainees



Hypothesis - 7:

There were no significant interaction effects between degree (Arts and Science) and awareness (low and high) on B.Ed. Trainees' acquisition of ICT abilities.

The two-factor analysis of variance was used to test the null hypothesis above, and the findings are provided in the accompanying table.

Table – 4.13

Results of two factor analysis of variance of interaction effects of degree (Arts and Science) and awareness (low and high) on learning skills in ICT of B.Ed. trainees

Sources of variation	Degrees of freedom	Sum of squares	Mean sum of squares	F-value	p-value
Main effects					
Degree	1	296.36	296.36	24.7104	0.0001*
Awareness	1	227.37	227.37	18.9582	0.0001*
2-way interaction effects					
Degree x Awareness	1	6.33	6.33	0.5274	0.4681
Error	396	4749.33	11.99		
Total	399	5279.39			

*p<0.05

As a result of the results of the preceding table, it is clear that,

- The primary influence of degree (Arts and Science) on the acquisition of ICT skills by B.Ed. Trainees are statistically significant (F=24.7104, p0.05) at the 5% significance level. As a result, the null hypothesis is discarded. This means that students are pursuing B.Ed. degrees in the arts and sciences have varying levels of ICT proficiency.

- The primary effect of awareness (low and high) on B.Ed. Trainees' ICT skill acquisition is found to be statistically significant (F=18.9582, p0.05) at a 5% significance level. As a result, the null hypothesis is discarded. This suggests that B.Ed. Students with low and high levels of ICT knowledge have varying levels of ICT proficiency.

- At a 5% significance level, the interaction effects of degree (Arts and Science) and awareness (low and high) on B.Ed. Trainees' ICT learning skills are shown to be statistically insignificant (F=0.5274, p>0.05). As a result, the null hypothesis is not ruled out. This suggests that B.Ed. Students with arts or science degrees who have a low or high understanding of ICT have significantly different learning skills in terms of ICT scores.

Additionally, pairwise comparisons of the interaction effects of degree (Arts and Science) and awareness (low and high) on the learning skills in ICT scores of B.Ed. Trainees were conducted using Tukey's multiple posthoc methods, which were reported in the tables below.

Table – 4.14

Pair wise comparisons of interaction effects of degree (Arts and Science) and awareness (low and high) on learning skills in ICT of B.Ed. trainees by Tukeys multiple posthoc procedures

Interactions	Arts degree with low awareness	Arts degree with high awareness	Science degree with low awareness	Science degree with high awareness
Mean	13.41	15.20	15.42	16.70
SD	2.80	3.41	2.67	4.59
Arts degree with low awareness	-			
Arts degree with high awareness	p=0.0023*	-		
Science degree with low awareness	p=0.0002*	p=0.9779	-	
Science degree with high awareness	p=0.0001*	p=0.0206*	p=0.0458*	-

*p<0.05

The findings imply that,

- At a 5% level of significance, arts degree B.Ed. Trainees with low awareness and arts degree B.Ed. Trainees with high awareness differ considerably in learning skills in ICT scores. This suggests that arts degree B.Ed. Trainees with a high level of awareness have significantly higher ICT scores than arts degree B.Ed. Trainees with a low level of awareness.

- At a 5% level of significance, arts degree B.Ed. Trainees with low awareness and science degree B.Ed. Trainees with low awareness differ considerably in learning skills in ICT scores. This suggests that scientific degree B.Ed. Trainees with low awareness score much higher on ICT learning skills than arts degree B.Ed. Trainees with low awareness.

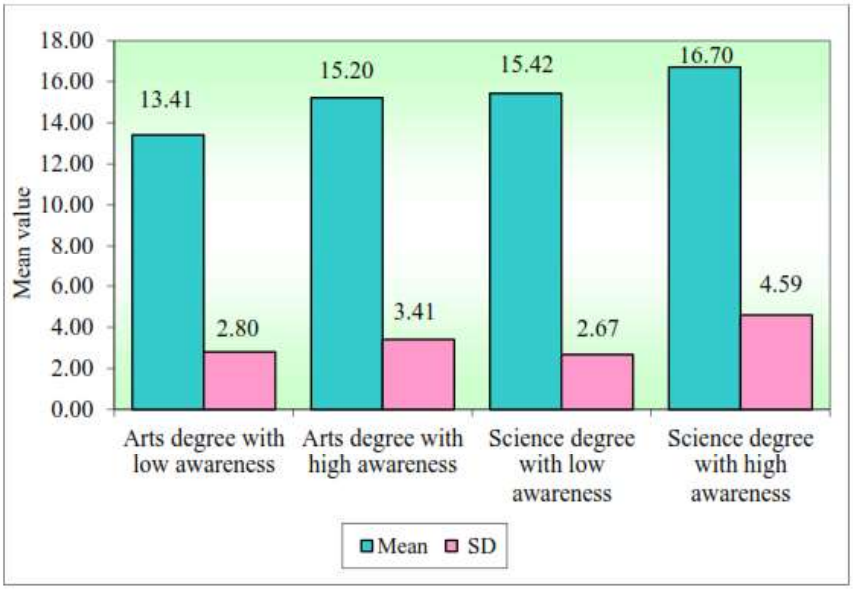
- At a 5% level of significance, arts degree B.Ed. Trainees with low awareness and science degree B.Ed. Trainees with high awareness differ considerably in learning skills in ICT scores. This suggests that science degree B.Ed. Trainees with a high level of awareness have significantly higher ICT results than arts degree B.Ed. Trainees with a low level of awareness.

- At a 5% level of significance, arts degree B.Ed. Trainees with high awareness and science degree B.Ed. Trainees with poor awareness do not differ substantially in learning skills in ICT scores. This suggests that arts degree B.Ed. Trainees with a high level of awareness and science degree B.Ed. Trainees with a low level of awareness have comparable ICT scores for learning skills.

- At the 5% level of significance, arts degree B.Ed. Trainees with high awareness and science degree B.Ed. Trainees with high awareness differ considerably in learning skills in ICT scores. This suggests that science degree B.Ed. Trainees with a high level of awareness have significantly higher ICT results than arts degree B.Ed. Trainees with a low level of awareness.

- At a 5% level of significance, science degree B.Ed. Trainees with high awareness and science degree B.Ed. Trainees with poor awareness differ considerably in learning skills in ICT scores. This suggests that scientific degree B.Ed. Trainees with a high level of awareness demonstrate significantly greater levels of learning skills in ICT scores than science degree B.Ed. Trainees with a low level of awareness. The following figure also includes the mean scores.

Figure - 4.7: Comparison of interaction effects of degree (arts and Science) and awareness (low and high) on learning skills in ICT of B. Ed trainees



Hypothesis - 8:

There was no significant interaction between gender (male and female) and awareness (low and high) on B.Ed. Trainees' acquisition of ICT abilities.

The two-factor analysis of variance was used to test the null hypothesis above, and the findings are provided in the accompanying table.

Table – 4.15

Results of two factor analysis of variance of interaction effects of gender (Male and Female) and awareness (low and high) on learning skills in ICT of B.Ed. trainees

Sources of variation	Degrees of freedom	Sum of squares	Mean sum of squares	F-value	p-value
Main effects					
Gender	1	297.12	297.12	24.8625	0.0001*
Awareness	1	198.23	198.23	16.5876	0.0001*
2-way interaction effects					
Gender x Awareness	1	51.05	51.05	4.2719	0.0394*
Error	396	4732.45	11.95		
Total	399	5278.86			

*p<0.05

As a result of the results of the preceding table, it is clear that,

- The main influence of gender (male and female) on the acquisition of ICT skills by B.Ed. Trainees are statistically significant (F=24.8625, p0.05) at the 5% significance level. As a result, the null hypothesis is rejected, but the alternative hypothesis is not. This suggests that male and female B.Ed. Students demonstrate significantly different learning abilities in terms of ICT scores.

- The primary effect of awareness (low and high) on the acquisition of ICT skills by B.Ed. Trainees are statistically significant (F=16.5876, p0.05) at the 5% significance level. As a result, the null hypothesis is rejected, but the alternative hypothesis is not. This suggests that B.Ed. Students with low and high levels of ICT awareness have varying levels of learning capabilities as measured by ICT scores.

- The interaction effect of gender (male and female) and awareness level (low and high) on B.Ed. Trainees' ICT skill acquisition is statistically significant (F=4.2719, p0.05) at a 5% significance level. As a result, the null hypothesis is rejected, but the alternative hypothesis is not. This suggests that B.Ed. Trainees with low and high awareness of ICT in aided and unaided colleges have varying ICT learning skills.

Additionally, pairwise comparisons of gender (male and female) and awareness (low and high) interaction effects on learning skills in ICT scores of B.Ed. Trainees were conducted using Tukey's multiple posthoc procedures, with the following results:

Table – 4.16

Pair wise comparisons of interaction effects of gender (Male and Female) and awareness (low and high) on learning skills in ICT of B.Ed. trainees by Tukeys multiple posthoc procedures

Interactions	Male with low awareness	Male with high awareness	Female with low awareness	Female with high awareness
Mean	13.84	14.55	14.87	17.05
SD	3.02	3.29	2.65	4.44
Male with low awareness	-			
Male with high awareness	p=0.5031	-		
Female with low awareness	p=0.1343	p=0.9362	-	
Female with high awareness	p=0.0001*	p=0.0001*	p=0.0001*	-

*p<0.05

As may be observed from the results of the preceding table,

- At a 5% level of significance, men B.Ed. Trainees with low awareness and male B.Ed. Trainees with high awareness do not differ substantially in learning skills in ICT scores. This suggests that male B.Ed. Students with low awareness and male B.Ed. Students with high awareness have comparable ICT scores for learning skills.

- Male and female B.Ed. Trainees with limited awareness do not differ substantially in learning skills in ICT scores at the 5% level of significance. This suggests that male B.Ed. Trainees with low awareness and female B.Ed. Trainees with low awareness have comparable ICT scores for learning skills.

- At a 5% significance level, male B.Ed. Trainees with low awareness and female B.Ed. Trainees with high awareness differ considerably in learning skills in ICT scores. This suggests that female B.Ed. Students with a high level of awareness have significantly greater learning skills in ICT scores than male B.Ed. Students with a low level of awareness.

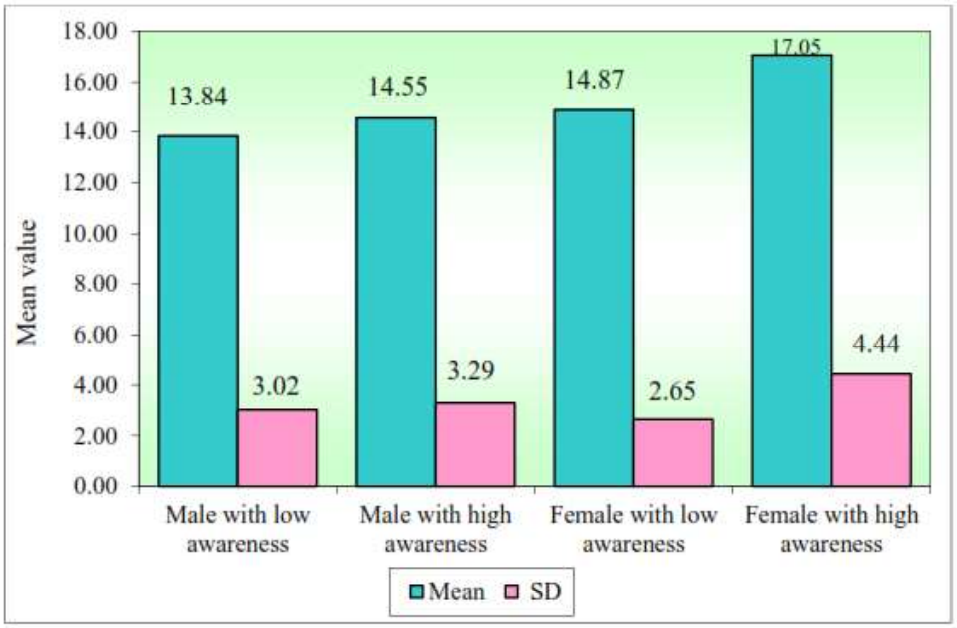
- At a 5% level of significance, male B.Ed. Trainees with high awareness and female B.Ed. Trainees with low awareness do not differ substantially in learning skills in ICT scores. This suggests that male B.Ed. Students with a high level of awareness and female B.Ed. Students with a low level of awareness have comparable learning skills as measured by ICT scores.

- At a 5% significance level, male B.Ed. Trainees with high awareness and female B.Ed. Trainees with high awareness differ considerably in learning skills in ICT scores. This suggests that female B.Ed. Students with a high level of awareness have significantly greater learning skills in ICT scores than male B.Ed. Students with a high level of awareness.

- At a 5% level of significance, female B.Ed. Trainees with low awareness and female B.Ed. Trainees with high awareness differ considerably in learning skills in ICT scores. This suggests that female B.Ed. Trainees with a high level of

awareness demonstrate significantly greater levels of learning skills in ICT scores than female B.Ed. Trainees with a low level of awareness. The following figure also includes the mean scores.

Figure - 4.8: Comparison of interaction effects of gender (Male and Female) and awareness (low and high) on learning skills in ICT of B. Ed trainees



Hypothesis - 9:

There were no significant interaction effects between management styles (Aided and Unaided) and attitudes (low and high) on B.Ed. Trainees' ICT skill acquisition.

The two-factor analysis of variance was used to test the null hypothesis above, and the findings are provided in the accompanying table.

Table – 4.17

Results of two factor analysis of variance of interaction effects of types of management (Aided and Unaided) and attitude (low and high) on learning skills in ICT of B.Ed. trainees

Sources of variation	Degrees of freedom	Sum of squares	Mean sum of squares	F-value	p-value
Main effects					
Managements	1	6.16	6.16	0.9742	0.3242
Attitude	1	2866.21	2866.21	453.6118	0.0001*
2-way interaction effects					
Managements x Attitude	1	12.58	12.58	1.9914	0.1590
Error	396	2502.18	6.32		
Total	399	5387.12			

*p<0.05

As a result of the results of the preceding table, it is clear that,

- The primary influence of management styles (assisted and unaided) on the acquisition of ICT skills by B.Ed. Trainees are shown to be statistically insignificant (F=0.9742, p>0.05) at a 5% significance level. As a result, H0 is not

rejected, but H1 is. This suggests that B.Ed. Students at aided and unassisted colleges demonstrate comparable learning abilities in ICT results.

- The primary influence of attitude (low and high) on the acquisition of ICT skills by B.Ed. Trainees are statistically significant (F=453.6118, p0.05) at the 5% significance level. As a result, H0 is rejected, whereas H1 is not. This suggests that B.Ed. Students with a negative attitude toward ICT and those with a positive attitude toward ICT have significantly different learning abilities as measured by ICT scores.

- The interaction effect of management style (assisted and unaided) and attitude (low and high) on the acquisition of ICT skills by B.Ed. Trainees are statistically insignificant (F=1.9914, p>0.05) at a 5% significance level. As a result, H0 is not rejected, but H1 is. This suggests that B.Ed. Trainees from aided and unassisted colleges with low or high ICT attitudes have comparable learning skills in terms of ICT scores.

Additionally, pairwise comparisons of the interaction effects of management styles (assisted and unaided) and attitudes (low and high) on learning skills in ICT scores of B.Ed. Trainees were conducted using Tukey's multiple posthoc methods, with the following results:

Table – 4.18

Pair wise comparisons of interaction effects of types of management (Aided and Unaided) and attitude (low and high) on learning skills in ICT of B.Ed. trainees by Tukeys multiple posthoc procedures

Interactions	Aided with low attitude	Aided with high attitude	Unaided with low attitude	Unaided with high attitude
Mean	11.60	17.40	12.21	17.29
SD	1.34	2.49	2.79	2.94
Aided with low attitude	-			
Aided with high attitude	p=0.0001*	-		
Unaided with low attitude	p=0.3992	p=0.0001*	-	
Unaided with high attitude	p=0.0001*	p=0.9876	p=0.0001*	-

*p<0.05

As may be observed from the results of the preceding table,

- At the 5% level of significance, B.Ed. Trainees from aided colleges with a poor attitude and B.Ed. Trainees from aided institutions with a high attitude differ considerably in learning skills in ICT scores. This suggests that B.Ed. Trainees at aided institutions with a positive attitude had higher ICT results than B.Ed. Trainees at aided colleges with a negative attitude.

- At the 5% level of significance, B.Ed. Trainees from aided colleges with a negative attitude and B.Ed. Trainees from unassisted institutions with a negative attitude do not differ substantially in learning skills in ICT scores. This suggests that B.Ed. Trainees at aided colleges with a negative attitude and B.Ed. Trainees at

unassisted colleges with a negative attitude have comparable ICT scores for learning skills.

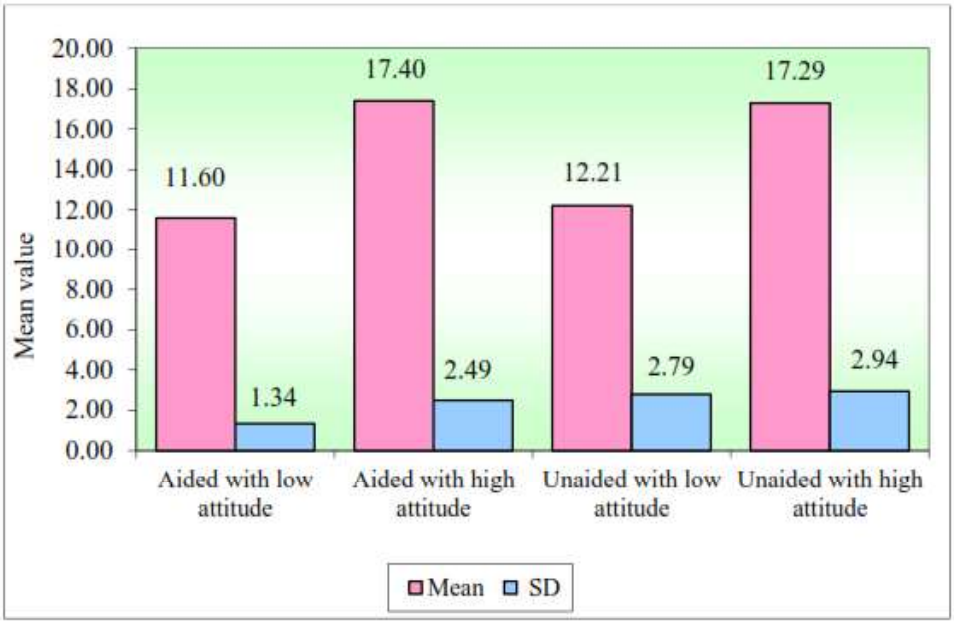
- At the 5% level of significance, B.Ed. Trainees from aided colleges with a negative attitude and B.Ed. Trainees from unassisted colleges with a positive attitude differ considerably in learning skills in ICT scores. This suggests that B.Ed. Trainees from independent colleges with a positive attitude had higher ICT results than B.Ed. Trainees from aided colleges with a negative attitude.

- At the 5% level of significance, B.Ed. Trainees from aided colleges with a positive attitude and B.Ed. Trainees from unassisted colleges with a negative attitude differ considerably in learning skills in ICT scores. This suggests that B.Ed. Trainees at unassisted colleges with a negative attitude had much higher ICT scores for learning skills than B.Ed. Trainees at aided colleges with a positive attitude.

- At the 5% level of significance, B.Ed. Trainees from aided colleges with a positive attitude and B.Ed. Trainees from unassisted colleges with a positive attitude do not differ substantially in learning skills in ICT scores. This suggests that B.Ed. Trainees in aided colleges with a positive attitude and B.Ed. Trainees in unassisted colleges with a positive attitude have comparable ICT scores for learning skills.

- At the 5% level of significance, B.Ed. Trainees from unaided colleges with a poor attitude and B.Ed. Trainees from unaided colleges with a high attitude differ considerably in learning skills in ICT scores. This suggests that B.Ed. Trainees at unassisted institutions with a positive attitude had higher ICT results than B.Ed. Trainees at unaided colleges with a negative attitude. The following figure also includes the mean scores.

Figure - 4.9: Comparison of interaction effects of types of management (Aided and Unaided) and attitude (low and high) on learning skills in ICT of B. Ed trainees



Hypothesis - 10:

There was no significant interaction between degree (Arts and Science) and attitude (low and high) on B.Ed. Trainees' acquisition of ICT capabilities.

The two-factor analysis of variance was used to test the null hypothesis above, and the findings are provided in the accompanying table.

Table – 4.19

Results of two factor analysis of variance of interaction effect of degree (Arts and Science) and attitude (low and high) on learning skills in ICT of B.Ed. trainees

Sources of variation	Degrees of freedom	Sum of squares	Mean sum of squares	F-value	p-value
Main effects					
Degree	1	91.20	91.20	14.9312	0.0001*
Attitude	1	2555.06	2555.06	418.3089	0.0001*
2-way interaction effects					
Degree x Attitude	1	1.05	1.05	0.1724	0.6782
Error	396	2418.80	6.11		
Total	399	5066.12			

*p<0.05

The findings imply that,

- The primary influence of degree (Arts and Science) on the acquisition of ICT skills by B.Ed. Trainees are statistically significant (F=14.9312, p0.05) at the 5% significance level. As a result, H0 is rejected, whereas H1 is not. This suggests that arts and science degree B.Ed. Trainees at colleges have significantly different ICT ratings for learning skills.

- The primary effect of attitude (low and high) on the acquisition of ICT skills by B.Ed. Trainees are statistically significant (F=418.3089, p0.05) at the 5% significance level. As a result, H0 is rejected, whereas H1 is not. This suggests that B.Ed. Students with a negative attitude toward ICT and those with a positive attitude toward ICT have significantly different learning abilities as measured by ICT scores.

- At a 5% significance level, the interaction effects of degree (Arts and Science) and attitude (low and high) on B. Ed. trainees' ICT learning skills are found to be statistically insignificant (F=0.1724, p>0.05). As a result, H0 is not rejected, but H1 is. This suggests that Arts and Science degree B.Ed. Trainees with a negative attitude toward ICT and those with a positive attitude toward ICT have significantly different learning abilities as measured by ICT scores.

Additionally, pairwise comparisons of the interaction effects of degree (Arts and Science) and attitude (low and high) on learning skills in ICT scores of B.Ed. Trainees were conducted using Tukey's multiple posthoc methods, with the following results:

Table – 4.20

Pair wise comparisons of interaction effects of degree (Arts and Science) and attitude (low and high) on learning skills in ICT of B.Ed. trainees by Tukeys multiple posthoc procedures

Interactions	Arts degree with low attitude	Arts degree with high attitude	Science degree with low attitude	Science degree with high attitude
Mean	11.56	16.70	12.44	17.80
SD	1.76	1.90	2.66	3.11
Arts degree with low attitude	-			
Arts degree with high attitude	p=0.0001*	-		
Science degree with low attitude	p=0.1135	p=0.0001*	-	
Science degree with high attitude	p=0.0001*	p=0.0043*	p=0.0001*	-

*p<0.05

As may be observed from the results of the preceding table,

- At the 5% level of significance, arts degree B. Ed. trainees with a poor attitude and arts degree B. Ed. trainees with a high attitude differ considerably in terms of learning skills in ICT scores. This suggests that arts degree B.Ed. Trainees with a positive attitude had significantly higher ICT scores than arts degree B.Ed. Trainees with a negative attitude.

- B.Ed. In Arts Trainees with a negative attitude and a B.Ed in science At a significance level of 5%, trainees with a negative attitude do not vary significantly in ICT learning skills. That is, the B.Ed. In Arts degree is equivalent to a B.Ed. In Arts degree. Trainees with a negative attitude and a B.Ed in science Trainees with a negative attitude demonstrate similar learning abilities as those with a positive attitude, as measured by their ICT scores.

- At the 5% level of significance, arts degree B.Ed. Trainees with a negative attitude and science degree B.Ed. Trainees with a positive attitude differ considerably in learning skills in ICT scores. This suggests that science degree B.Ed. Trainees with a positive attitude had significantly higher ICT results than arts degree B.Ed. Trainees with a negative attitude.

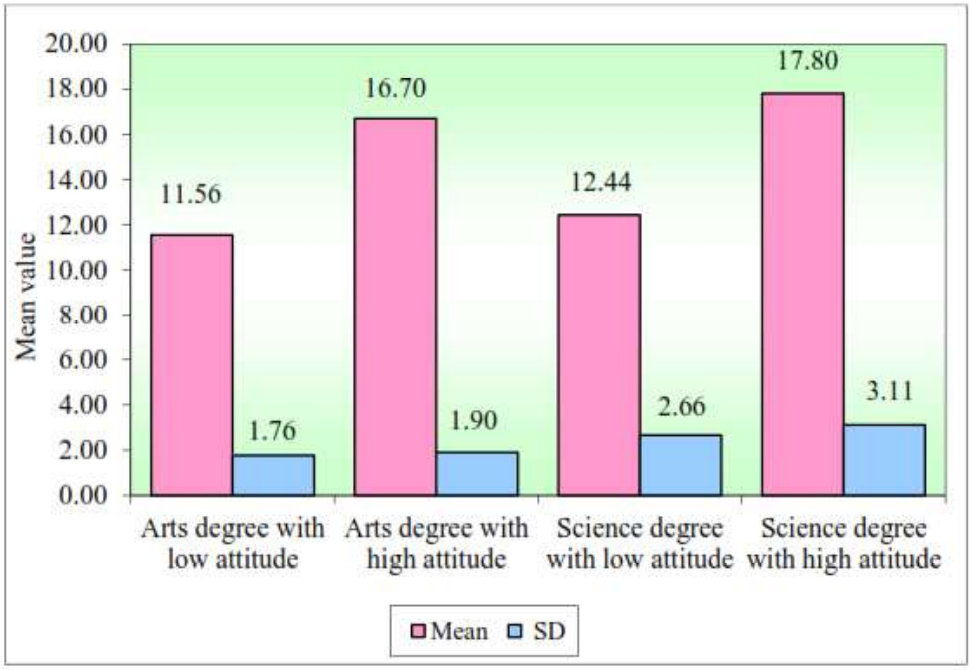
- At the 5% level of significance, arts degree B.Ed. Trainees with a positive attitude and science degree B.Ed. Trainees with a negative attitude differ considerably in learning skills in ICT scores. This suggests that arts degree B.Ed. Trainees with a positive attitude and science degree B.Ed. Trainees with a negative attitude have significantly different ICT scores for learning skills.

- At the 5% level of significance, arts degree B.Ed. Trainees with a positive attitude and science degree B.Ed. Trainees with a positive attitude differ considerably in learning skills in ICT scores. This suggests that science degree B.Ed. Trainees with a positive attitude had significantly higher ICT results than arts degree B.Ed. Trainees with a negative attitude.

- At the 5% level of significance, science degree B.Ed. Trainees with a positive attitude and science degree B.Ed. Trainees with a positive attitude differ considerably in learning skills in ICT scores. This suggests that scientific degree

B.Ed. Trainees with a positive attitude had significantly higher ICT scores than science degree B.Ed. Trainees with a negative attitude. The following figure also includes the mean scores.

Figure - 4.10: Comparison of interaction effects of degree (Arts and Science) and attitude (low and high) on learning skills in ICT of B. Ed trainees



Hypothesis - 11:

There was no significant interaction between gender (male and female) and attitude (low and high) on B.Ed. Trainees' acquisition of ICT skills.

The two-factor analysis of variance was used to test the null hypothesis above, and the findings are provided in the accompanying table.

Table – 4.21

Results of two factor analysis of variance of interaction effect of gender (Male and Female) and attitude (low and high) on learning skills in ICT of B.Ed. trainees

Sources of variation	Degrees of freedom	Sum of squares	Mean sum of squares	F-value	p-value
Main effects					
Gender	1	166.86	166.86	28.1164	0.0001*
Attitude	1	2625.18	2625.18	442.358	0.0001*
2-way interaction effects					
Gender x Attitude	1	1.40	1.40	0.2354	0.6278
Error	396	2350.07	5.93		
Total	399	5143.50			

*p<0.05

As a result of the results of the preceding table, it is clear that,

- The main influence of gender (male and female) on the acquisition of ICT skills by B.Ed. Trainees are statistically significant (F=28.1164, p0.05) at the 5% significance level. As a result, H0 is rejected, whereas H1 is not. This suggests that male and female B.Ed. Students demonstrate significantly different learning abilities in terms of ICT scores.

- The primary effect of attitude (low and high) on the acquisition of ICT skills by B.Ed. Trainees are statistically significant (F=442.358, p0.05) at the 5% significance level. As a result, H0 is rejected, whereas H1 is not. This suggests that B.Ed. Students with a negative attitude toward ICT and those with a positive attitude toward ICT have significantly different learning abilities as measured by ICT scores.

- At a 5% significance level, the interaction effects of gender (male and female) and attitude (low and high) on B.Ed. Trainees' ICT learning skills are shown to be statistically insignificant (F=0.2354, p>0.05). As a result, H0 is not rejected, but H1 is. This suggests that male and female B.Ed. Trainees with low or high ICT attitudes have comparable learning skills in ICT scores.

Additionally, pairwise comparisons of the interaction effects of gender (male and female) and attitude (low and high) on the learning skills in ICT scores of B.Ed. Trainees were conducted using Tukey's multiple posthoc methods, with the following results:

Table – 4.22

Pair wise comparisons of interaction effects of gender (Male and Female) and attitude (low and high) on learning skills in ICT of B.Ed. trainees by Tukeys multiple posthoc procedures

Interactions	Male with low attitude	Male with high attitude	Female with low attitude	Female with high attitude
Mean	11.29	16.67	12.74	17.88
SD	1.34	1.79	2.78	3.19
Male with low attitude	-			
Male with high attitude	p=0.0001*	-		
Female with low attitude	p=0.0010*	p=0.0001*	-	
Female with high attitude	p=0.0001*	p=0.0010*	p=0.0001*	-

*p<0.05

As may be observed from the results of the preceding table,

- At the 5% level of significance, male B.Ed. Trainees with a low attitude and male B.Ed. Trainees with a high attitude differ considerably in learning skills in ICT scores. This suggests that male B.Ed. Trainees with a positive attitude had significantly higher ICT scores than male B.Ed. Trainees with a negative attitude.

- At the 5% level of significance, male B.Ed. Trainees with a negative attitude and female B.Ed. Trainees with a negative attitude differ considerably in learning skills in ICT scores. This suggests that female B.Ed. Students with a negative attitude have significantly higher learning skills in ICT scores than male B.Ed. Students with a negative attitude.

- At the 5% level of significance, male B.Ed. Trainees with a low attitude and female B.Ed. Trainees with a high attitude differ considerably in learning skills in ICT scores. This suggests that female B.Ed. Students with a positive attitude have significantly greater learning skills in ICT scores than male B.Ed. Students with a negative attitude.

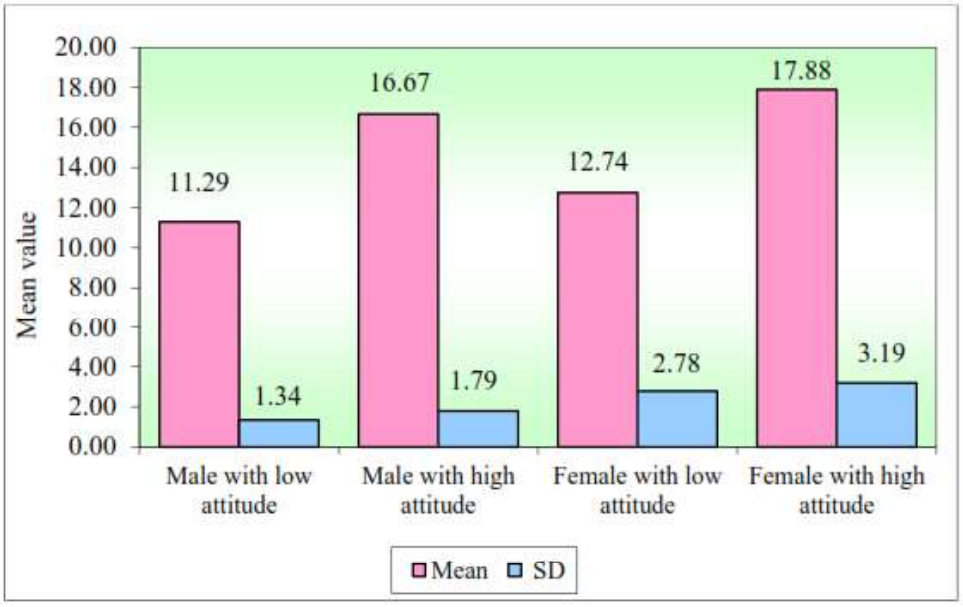
- The male bachelor of education (B.Ed. Female B.Ed. Trainees with a positive attitude At the 5% level of significance, trainees with a negative attitude vary considerably from those with a positive attitude in terms of learning skills in ICT scores. That is, the male B.Ed. Female B.Ed. Trainees with a positive attitude have significantly higher ICT results than female B.Ed. Trainees with a negative attitude.

- At the 5% level of significance, male B.Ed. Trainees with a positive attitude and female B.Ed. Trainees with a positive attitude differ considerably in learning skills in ICT scores. This suggests that female B.Ed. Students with a positive attitude have significantly greater learning skills in ICT scores than male B.Ed. Students with a positive attitude.

- At the 5% level of significance, female B.Ed. Trainees with a low attitude and female B.Ed. Trainees with a high attitude differ considerably in learning skills in ICT scores. This suggests that female B.Ed. Trainees with a positive attitude demonstrate significantly greater learning capabilities in ICT scores than

female B.Ed. Trainees with a negative attitude. The following figure also includes the mean scores.

Figure - 4.11: Comparison of interaction effects of gender (Male and Female) and attitude (low and high) on learning skills in ICT of B.Ed trainees



Hypothesis - 12:

There was no significant interaction between awareness (low and high) and attitude (low and high) on B.Ed. Trainees' ability to master ICT skills.

The two-factor analysis of variance was used to test the null hypothesis above, and the findings are provided in the accompanying table.

Table – 4.23

Results of two factor analysis of variance of interaction effect of awareness (low and high) and attitude (low and high) on learning skills in ICT of B.Ed. trainees

Sources of variation	Degrees of freedom	Sum of squares	Mean sum of squares	F-value	p-value
Main effects					
Awareness	1	192.14	192.14	33.5854	0.0001*
Attitude	1	2795.98	2795.98	488.7195	0.0001*
2-way interaction effects					
Awareness x Attitude	1	25.78	25.78	4.5059	0.0344*
Error	396	2265.53	5.72		
Total	399	5279.43			

*p<0.05

As a result of the results of the preceding table, it is clear that,

- The primary effect of awareness (low and high) on B.Ed. Trainees' ICT skill acquisition is determined to be statistically significant (F=33.5854, p0.05) at a 5% significance level. As a result, H0 is rejected, whereas H1 is not. This suggests that B.Ed. Students with low and high levels of ICT awareness have varying levels of learning capabilities as measured by ICT scores.

- The primary influence of attitude (low and high) on the acquisition of ICT skills by B.Ed. Trainees are statistically significant (F=488.7195, p0.05) at the 5% significance level. As a result, H0 is rejected, whereas H1 is not. This suggests that B.Ed. Students with a negative attitude toward ICT and those with a positive attitude toward ICT have significantly different learning abilities as measured by ICT scores.

- The interaction effects of awareness (low and high) and attitude (low and high) on B.Ed. Trainees' ICT learning skills are statistically significant (F=4.5059, p0.05) at the 5% significance level. As a result, H0 is rejected, whereas H1 is not. This suggests that B.Ed. Students with low and high levels of awareness and attitude toward ICT have varying levels of learning skills as measured by ICT scores.

Additionally, pairwise comparisons of the interaction effects of awareness (low and high) and attitude (low and high) on learning skills in ICT scores of B.Ed. Trainees were conducted using Tukey's multiple posthoc methods, with the following results:

Table – 4.24

Pair wise comparisons of interaction effects of awareness (low and high) and attitude (low and high) on learning skills in ICT of B.Ed. trainees by Tukeys multiple posthoc procedures

Interactions	Low awareness with low attitude	Low awareness with high attitude	High awareness with low attitude	High awareness with high attitude
Mean	11.52	16.40	12.41	18.34
SD	1.40	1.75	2.86	3.19
Low awareness with low attitude	-			
Low awareness with high attitude	p=0.0001*	-		
High awareness with low attitude	p=0.0800	p=0.0001*	-	
High awareness with high attitude	p=0.0001*	p=0.0001*	p=0.0001*	-

*p<0.05

As may be observed from the results of the preceding table,

- At a 5% level of significance, B.Ed. Trainees with low awareness and low attitude and B.Ed. Trainees with low awareness and low attitude differ considerably in learning skills in ICT scores. This suggests that B.Ed. Students who are low on awareness and low on attitude have significantly greater learning skills in ICT scores than B.Ed. Students who are low on awareness and low on attitude.

- At a 5% significance level, the B.Ed. Trainees with low awareness and poor attitude and those with high awareness and low attitude do not differ substantially in terms of learning skills in ICT scores. This suggests that B.Ed. Students who have low awareness, poor attitude, and high awareness and low attitude have equivalent learning skills as measured by ICT scores.

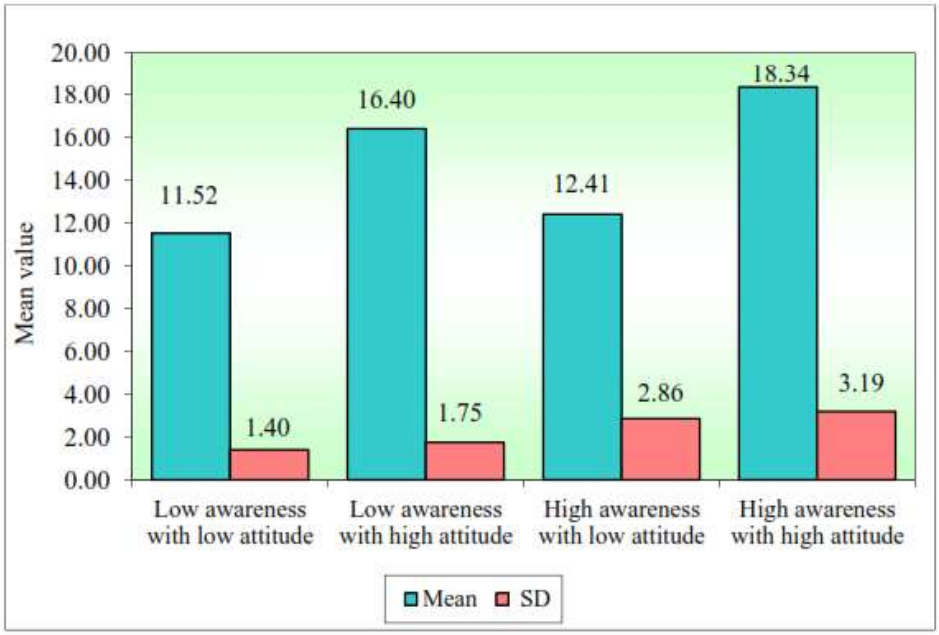
- At a 5% level of significance, B.Ed. Trainees with low awareness and low attitude and B.Ed. Trainees with high awareness and high attitudes differ considerably in learning skills in ICT scores. This suggests that B.Ed. Trainees with a high level of awareness and a positive attitude have significantly greater learning skills in ICT scores than B.Ed. Trainees with a low level of awareness and a negative attitude.

- At a 5% level of significance, B.Ed. Trainees with low awareness and high attitude and B.Ed. Trainees with high awareness and low attitudes differ considerably in learning skills in ICT scores. This suggests that B.Ed. Trainees with low awareness and a positive attitude have significantly greater learning skills in ICT scores than B.Ed. Trainees with high awareness and a negative attitude.

- At a 5% significance level, the B.Ed. Trainees with low awareness, high attitude, and high awareness and low attitude differ considerably in terms of learning skills in ICT scores. This means that B.Ed. Trainees with a high level of awareness and a positive attitude have significantly higher learning skills in ICT scores than B.Ed. Trainees with a low level of awareness and a positive attitude.

- At a 5% level of significance, B.Ed. Trainees with high awareness and a low attitude and B.Ed. Trainees with high awareness and a high attitude differ considerably in learning skills in ICT scores. This suggests that B.Ed. Trainees with a high level of awareness and a positive attitude have significantly greater learning skills in ICT scores than B.Ed. Trainees with a low level of awareness and a negative attitude. The following figure also includes the mean scores.

Figure - 4.12: Comparison of interaction effects of awareness (low and high) and attitude (low and high) on learning skills in ICT of B. Ed trainees



4.4 CORRELATION ANALYSIS

The present study used learning skills in ICT scores as a response variable and B.Ed. Trainees' awareness of and attitude toward ICT as explanatory variables. The correlation coefficients were calculated to determine the link between the response variable and the explanatory variables. Correlation coefficients are obtained using the Karl-product Pearson's moment correlation coefficient method and are represented mathematically as follows:

$$r = \frac{\sum XY - n\bar{x}\bar{y}}{\sqrt{(\sum X^2 - n\bar{x}^2)(\sum Y^2 - n\bar{y}^2)}}$$

If r = 0, no correlation exists between the two variables. If r is a positive value, it indicates that there is a positive correlation and the values of one variable increase as the value of another variable increase; if r is a negative value, it indicates that there is a negative correlation and the values of one variable increase as the value of another variable decrease. If r is a negative value, it indicates a negative correlation and the values of one variable increase as the value of another variable decrease.

Hypothesis – 13:

There is no substantial association between the acquisition of ICT skills, awareness of, and attitude toward ICT among B.Ed. Trainees.

Karl Pearson's correlation coefficient method was used to test the null hypothesis above, and the findings are provided in the accompanying table.

Table – 4.25

Relationships between learning skills in ICT, awareness and attitude towards ICT of B.Ed. trainees with r-value, t-value and p-value

Variables	Relationships between		
	r-value	t-value	p-value
Learning skills in ICT with Awareness of ICT	0.4149	9.0962	0.0001*
Learning skills in ICT with attitude towards ICT	0.8108	27.6365	0.0001*
Awareness with attitude towards ICT	0.3348	7.0891	0.0001*

*p<0.05

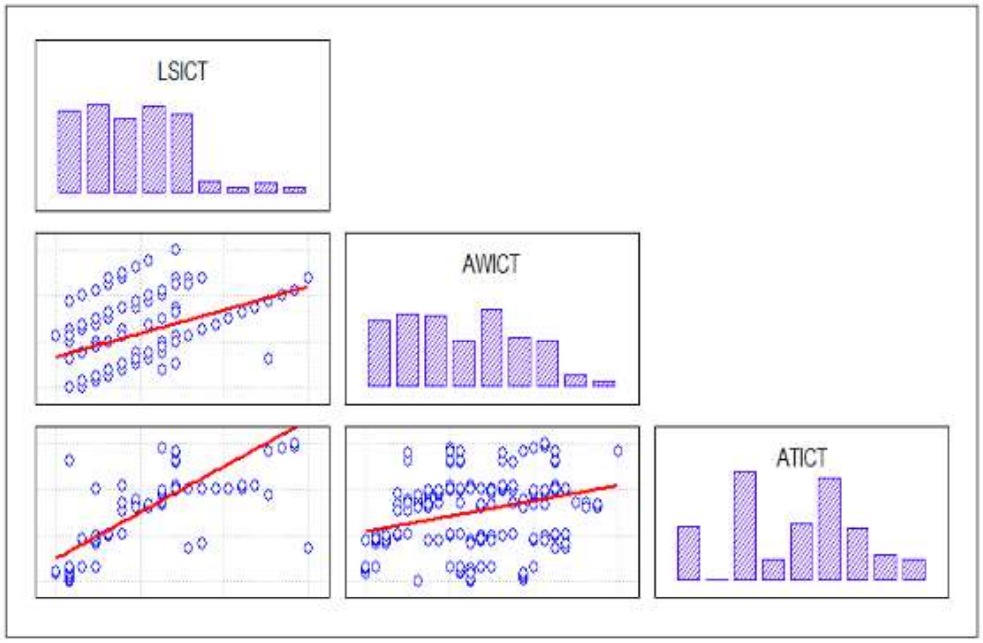
The results of the preceding table demonstrate unequivocally that,

- A substantial and positive link was established between B.Ed. Trainees' acquisition of ICT skills and awareness of ICT (r=0.4149, p0.05) at the 5% significance level. As a result, the null hypothesis is rejected in favor of the alternative hypothesis. This indicates that the ICT learning skills and awareness of B.Ed. Learners are interdependent. In other words, the learning skills in ICT scores grow or decrease in correlation with the increase or decline in B.Ed. Trainees' awareness of ICT.

- At the 5% significance level, a significant and positive association was identified between the acquisition of ICT abilities and the attitude toward ICT of B.Ed. trainees (r=0.8108, p0.05). As a result, the null hypothesis is rejected in favor of the alternative hypothesis. This suggests that B.Ed. Trainees' ICT learning skills and attitudes toward ICT are interdependent. In other words, the learning skills in ICT scores rise or decrease in correlation with the trainees' attitude toward ICT.

- At the 5% significance level, a significant and positive association was observed between B.Ed. Trainees' awareness of ICT and attitude toward ICT (r=0.3348, p0.05). As a result, the null hypothesis is discarded, and the alternative hypothesis is accepted. This suggests that the awareness of ICT and the attitude toward B.Ed. Students are interdependent. In other words, the attitude toward ICT scores grow or decrease as the attitude toward ICT of B.Ed. Trainees increases or decrease. Additionally, the correlations were depicted in the Scatter diagram below.

Figure – 4.13: Scatter diagram of relationships between learning skills in ICT, awareness and attitude towards ICT of B.Ed. trainees.



Hypothesis - 14:

There is no significant correlation between learning ICT skills and awareness of and attitude toward ICT among aided college B.Ed. Trainees.

Karl Pearson's correlation coefficient method was used to test the null hypothesis above, and the findings are provided in the accompanying table.

Table – 4.26

Relationships between learning skills in ICT, awareness and attitude towards ICT of aided college B.Ed. trainees with r-value, t-value and p-value

Variables	Relationships between		
	r-value	t-value	p-value
Learning skills in ICT with Awareness of ICT	0.3918	5.9917	0.0001*
Learning skills in ICT with attitude towards ICT	0.8665	24.4292	0.0001*
Awareness with attitude towards ICT	0.3142	4.6565	0.0001*

*p<0.05

The results of the preceding table demonstrate unequivocally that,

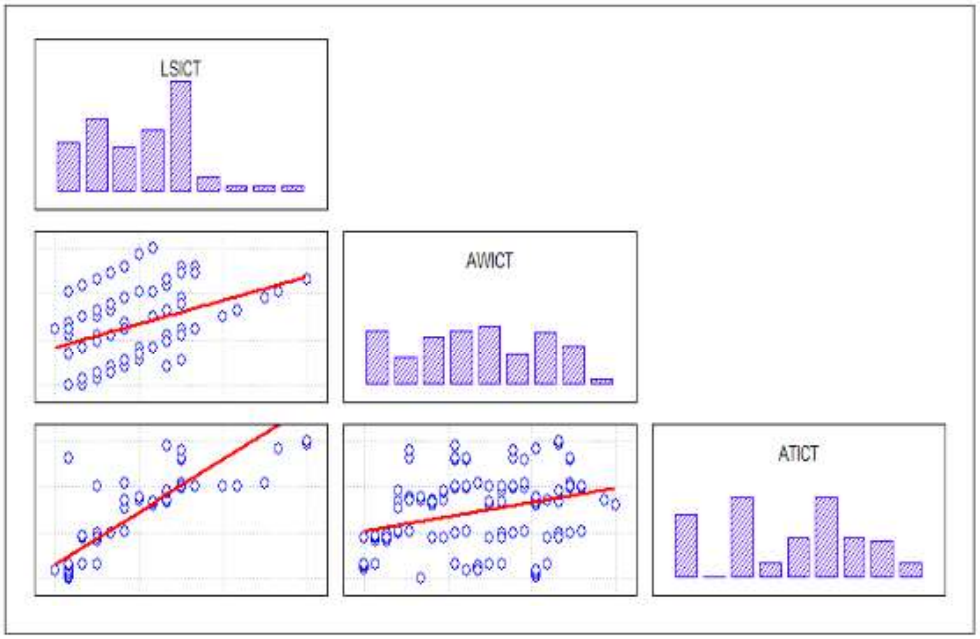
- At the 5% level of significance, a significant and positive link was discovered between the acquisition of ICT skills and awareness of B.Ed. trainees in aided colleges (r=0.3918, p0.05). As a result, the null hypothesis is rejected in favor of the alternative hypothesis. This indicates the acquisition of ICT skills and an understanding of ICT among B.Ed. Trainees at aided colleges are interdependent. In other words, the learning skills in ICT scores grow or decrease in correlation with the level of awareness of B.Ed. Trainees in aided colleges toward ICT.

- At the 5% significance level, a significant and positive association was discovered between the acquisition of ICT skills and the attitude toward ICT of B.Ed. trainees in aided colleges (r=0.8665, p0.05). As a result, the null hypothesis is rejected in favor of the alternative hypothesis. This suggests the acquisition of ICT skills and the attitude toward ICT of B.Ed. Trainees at aided colleges are interdependent. In other words, the learning skills in ICT scores rise or drop in correlation with the attitude toward ICT of aided college B.Ed. Trainees.

- At the 5% significance level, a significant and positive connection was discovered between awareness of ICT and attitude toward ICT among B.Ed. trainees in aided colleges (r=0.3142, p0.05). As a result, the null hypothesis is

rejected in favor of the alternative hypothesis. This suggests that the awareness of ICT and the attitude toward B.Ed. Students enrolled in aided colleges are interdependent. In other words, the awareness of ICT scores increases or falls in correlation with the attitude toward ICT of aided college B.Ed. Trainees. Additionally, the correlations were depicted in the scatter diagram below.

Figure – 4.14: Scatter diagram of relationships between learning skills in ICT, awareness and attitude towards ICT of B.Ed. trainees of aided colleges



Hypothesis - 15:

There is no substantial association between the acquisition of ICT skills, awareness of, and attitude toward ICT among unaided college B.Ed. Trainees.

Karl Pearson's correlation coefficient method was used to test the null hypothesis above, and the findings are provided in the accompanying table.

Table – 4.27

Relationships between learning skills in ICT, awareness and attitude towards ICT of unaided college B.Ed. trainees with r-value, t-value and p-value

Variables	Relationships between		
	r-value	t-value	p-value
Learning skills in ICT with Awareness of ICT	0.4485	7.0600	0.0001*
Learning skills in ICT with attitude towards ICT	0.7615	16.5317	0.0001*
Awareness with attitude towards ICT	0.3725	5.6476	0.0001*

*p<0.05

The results of the preceding table demonstrate unequivocally that,

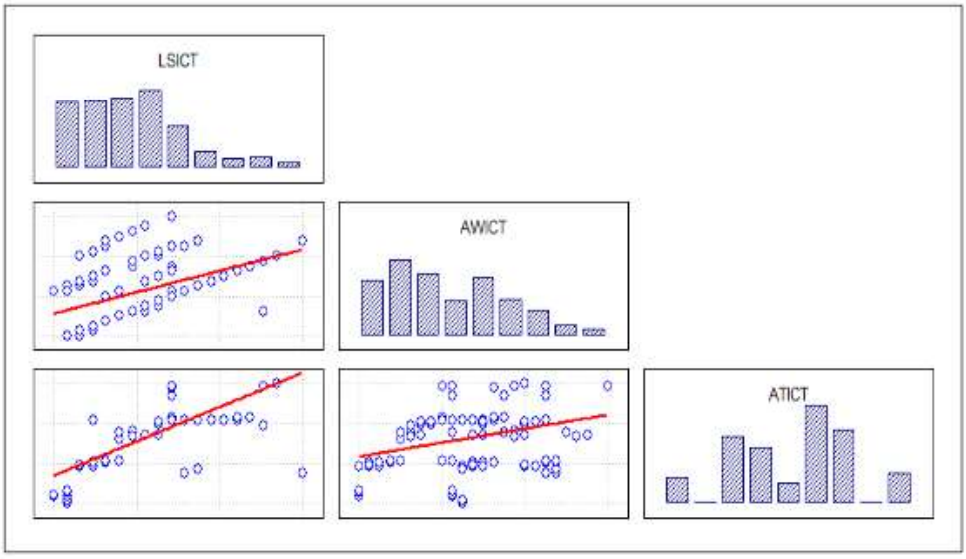
- At the 5% level of significance, a significant and positive link was discovered between the acquisition of ICT skills and awareness of B.Ed. trainees in unassisted colleges (r=0.4485, p0.05). As a result, the null hypothesis is rejected in favor of the alternative hypothesis. This suggests the acquisition of ICT skills and knowledge among unassisted college B.Ed. Trainees are interdependent. In other words, the learning skills in ICT scores grow or decrease in correlation with the level of awareness of B.Ed. Trainees in unassisted colleges toward ICT.

A substantial and favorable association was established between the acquisition of ICT skills and the attitude toward ICT of unaided college B.Ed. trainees (r=0.7615, p0.05) at the 5% level of significance. As a result, the null hypothesis is rejected in favor of the alternative hypothesis. This suggests the ICT learning capabilities and attitude toward ICT of unassisted college B.Ed. Learners are interdependent. In other words, the learning skills in ICT scores rise or decline in correlation with the attitude toward ICT of unaided college B.Ed. Trainees.

- At the 5% significance level, a significant and positive association was discovered between awareness of ICT and attitude toward ICT among B.Ed. trainees in unassisted colleges (r=0.3725, p0.05). As a result, the null hypothesis is

rejected in favor of the alternative hypothesis. This suggests the attitude toward ICT and the attitude toward ICT of unaided college B.Ed. Trainees are interdependent. In other words, the attitude toward ICT scores increase or drop in correlation with the attitude toward ICT of unaided college B.Ed. Trainees. Additionally, the correlations were depicted in the Scatter diagram below.

Figure – 4.15: Scatter diagram of relationships between learning skills in ICT, Awareness and attitude towards ICT of B. Ed. trainees of unaided colleges



Hypothesis - 16:

There is no substantial association between the acquisition of ICT skills, awareness of, and attitude toward ICT among arts-graduated B.Ed. Trainees.

Karl Pearson's correlation coefficient method was used to test the null hypothesis above, and the findings are provided in the accompanying table.

Table – 4.28

Relationships between learning skills in ICT, awareness and attitude towards ICT of arts graduated B.Ed. trainees with r-value, t-value and p-value

Variables	Relationships between		
	r-value	t-value	p-value
Learning skills in ICT with Awareness of ICT	0.4508	7.1056	0.0001*
Learning skills in ICT with attitude towards ICT	0.8723	25.1055	0.0001*
Awareness with attitude towards ICT	0.3971	6.0883	0.0001*

*p<0.05

As a result of the data in the preceding table, it is clear that,

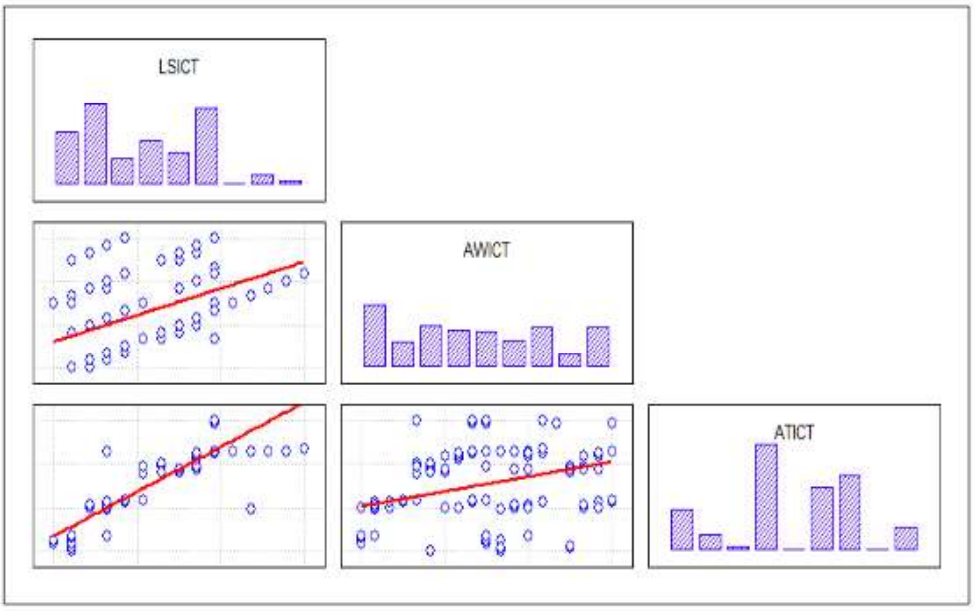
- A substantial and favorable link was identified between the acquisition of ICT skills and awareness of arts graduates with a B.Ed in education. at the 5% level of significance (r=0.4508, p0.05). As a result, the null hypothesis is rejected in favor of the alternative hypothesis. This indicates that arts graduates with a B.Ed. have acquired ICT skills and an awareness of ICT. Trainees are interdependent. In other words, the learning skills in ICT scores grow or decrease in proportion to the level of awareness of arts graduates with a B.Ed. In ICT. Trainees.

- At the 5% significance level, a significant and favorable association was established between learning ICT skills and attitudes toward ICT among arts-graduated B.Ed. trainees (r=0.8723, p0.05). As a result, the null hypothesis is rejected in favor of the alternative hypothesis. This suggests that the ICT learning abilities and attitudes of arts-graduated B.Ed. Trainees are interdependent. In other words, the learning skills in ICT scores rise or decrease in proportion to the trainees' attitude toward ICT after completing their B.Ed. In arts.

- At the 5% significance level, a significant and positive association was discovered between trainees' awareness of ICT and attitude toward ICT (r=0.3971, p0.05). As a result, the null hypothesis is rejected in favor of the alternative

hypothesis. This suggests that the attitude toward ICT and the attitude toward ICT of arts graduates pursuing a B.Ed. Are interdependent. In other words, the attitude toward ICT scores increases or drops in correlation with the attitude toward ICT of arts graduates enrolled in a B.Ed. Program. Additionally, the correlations were depicted in the scatter diagram below.

Figure – 4.16: Scatter diagram of relationships between learning skills in ICT, awareness and attitude towards ICT of arts graduated B.Ed. trainees



Hypothesis - 17:

There is no substantial association between the acquisition of ICT skills, awareness of, and attitude toward ICT among science-graduated B.Ed. Trainees.

Karl Pearson's correlation coefficient method was used to test the null hypothesis above, and the findings are provided in the accompanying table.

Table – 4.29

Relationships between learning skills in ICT, awareness and attitude towards ICT of science graduated B.Ed. trainees with r-value, t-value and p-value

Variables	Relationships between		
	r-value	t-value	p-value
Learning skills in ICT with Awareness of ICT	0.3043	4.4943	0.0001*
Learning skills in ICT with attitude towards ICT	0.7430	15.6216	0.0001*
Awareness with attitude towards ICT	0.1754	2.5063	0.0001*

*p<0.05

The results of the preceding table demonstrate unequivocally that,

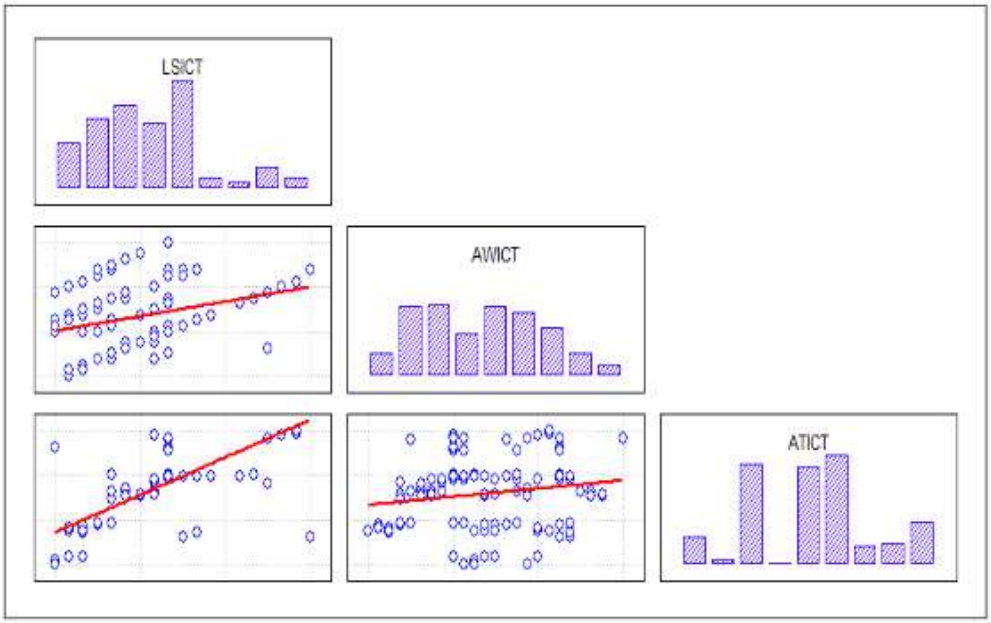
- At the 5% significance level, a significant and positive association was discovered between learning ICT skills and awareness of ICT among science B.Ed. trainees (r=0.3043, p0.05). As a result, the null hypothesis is rejected in favor of the alternative hypothesis. This suggests that the ICT learning skills and ICT awareness of Science B.Ed. Trainees are interdependent. In other words, the learning skills in ICT scores grow or decrease in correlation with the level of awareness of scientific B.Ed. Trainees about ICT.

- At the 5% significance level, a significant and favorable association was discovered between science B.Ed. Trainees' development of ICT abilities and attitude toward ICT (r=0.7430, p0.05). As a result, the null hypothesis is rejected, and an alternative hypothesis is formulated. This implies that the science B.Ed. Trainees' ICT learning abilities and attitudes toward ICT are interdependent. In other words, the scores for learning skills in ICT rise or decrease in correlation with the trainees' attitude toward ICT.

- At the 0.05 level of significance, a significant and positive association was discovered between science B.Ed. Trainees' awareness of ICT and attitude toward ICT (r=0.1754, p0.05). As a result, the null hypothesis is rejected in favor of the alternative hypothesis. This suggests that science B.Ed. Trainees' awareness of

and attitude toward ICT are interdependent. In other words, the attitude toward ICT scores increases or decreases as the attitude toward ICT of science B.Ed. Trainees increases or drop. Additionally, the correlations were depicted in the scatter diagram below.

Figure – 4.17: Scatter diagram of relationships between learning skills in ICT, awareness and attitude towards ICT of Science graduated B.Ed. trainees



Hypothesis - 18:

There is no significant association between the acquisition of ICT skills, awareness, and attitude toward ICT among male B.Ed. Trainees.

Karl Pearson's correlation coefficient method was used to test the null hypothesis above, and the findings are provided in the accompanying table.

Table – 4.30

Relationships between learning skills in ICT, awareness and attitude towards ICT of male B.Ed. trainees with r-value, t-value and p-value

Variables	Relationships between		
	r-value	t-value	p-value
Learning skills in ICT with Awareness of ICT	0.3792	5.7672	0.0001*
Learning skills in ICT with attitude towards ICT	0.8993	28.9303	0.0001*
Awareness with attitude towards ICT	0.3045	4.4981	0.0001*

*p<0.05

The results of the preceding table demonstrate unequivocally that,

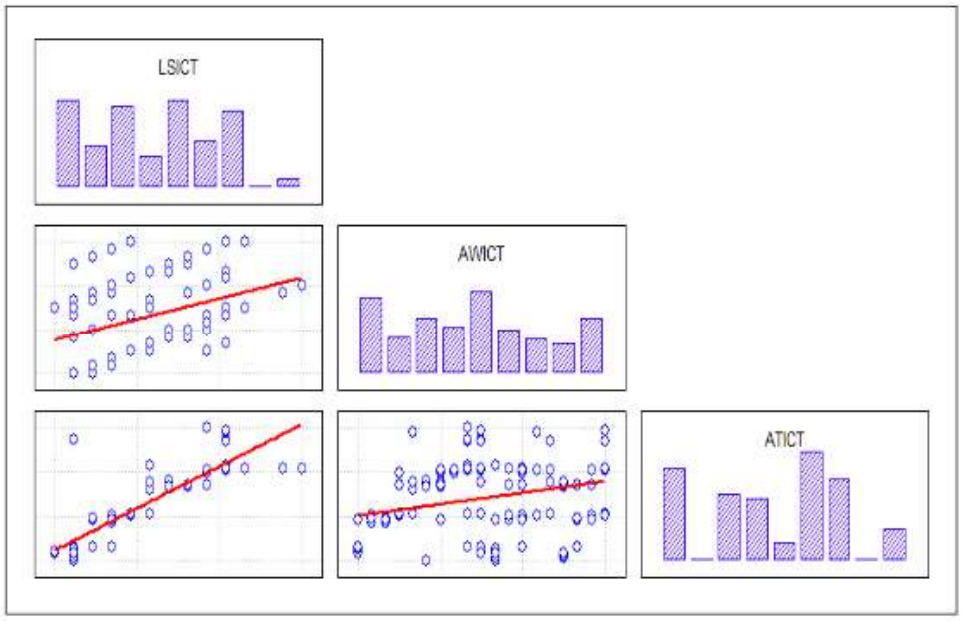
- A substantial and favorable link was established between male B.Ed. Trainees' acquisition of ICT skills and awareness of ICT (r=0.3792, p0.05) at the 5% significance level. As a result, the null hypothesis is rejected in favor of the alternative hypothesis. This suggests that the ICT learning skills and awareness of male B.Ed. Trainees are interdependent. In other words, the learning skills in ICT scores grow or decrease in correlation with male B.Ed. Trainees' increased or decreased awareness of ICT.

- At the 5% significance level, a significant and positive association was discovered between learning ICT skills and attitude toward ICT among male B.Ed. trainees (r=0.8993, p0.05). As a result, the null hypothesis is discarded, and the alternative hypothesis is accepted. This suggests that male B.Ed. Trainees' ICT learning skills and attitudes toward ICT are interdependent. In other words, the learning skills in ICT scores grow or decrease in correlation with the male B.Ed. Trainees' attitude toward ICT.

- At the 5% significance level, a significant and positive association was discovered between male B.Ed. Trainees' awareness of ICT and attitude toward ICT (r=0.3045, p0.05). As a result, the null hypothesis is rejected in favor of the

alternative hypothesis. This implies the attitude toward ICT and the attitude toward ICT of male B.Ed. Trainees are mutually reinforcing. In other words, the attitude toward ICT scores increases or drops in proportion to the male B.Ed. Trainees' attitude toward ICT. Additionally, the correlations were depicted in the scatter diagram below.

Figure – 4.18: Scatter diagram of relationships between learning skills in ICT, awareness and attitude towards ICT of male B.Ed. trainees



Hypothesis - 19:

There is no significant association between the acquisition of ICT skills, awareness of ICT, and attitude toward ICT among female B.Ed. Trainees.

Karl Pearson's correlation coefficient method was used to test the null hypothesis above, and the findings are provided in the accompanying table.

Table – 4.31

Relationships between learning skills in ICT, awareness and attitude towards ICT of female B.Ed. trainees with r-value, t-value and p-value

Variables	Relationships between		
	r-value	t-value	p-value
Learning skills in ICT with Awareness of ICT	0.3748	5.6885	0.0001*
Learning skills in ICT with attitude towards ICT	0.7303	15.0440	0.0001*
Awareness with attitude towards ICT	0.2937	4.3227	0.0001*

*p<0.05

The results of the preceding table demonstrate unequivocally that,

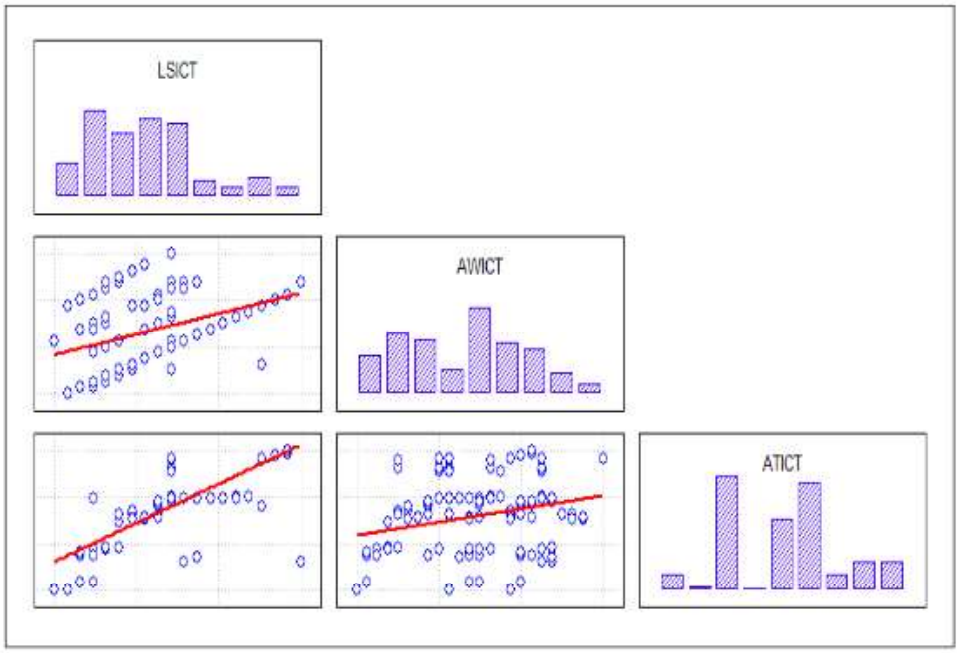
- A substantial and positive association was identified between female B.Ed. Trainees' acquisition of ICT skills and awareness of ICT (r=0.3748, p0.05) at the 5% significance level. As a result, the null hypothesis is rejected in favor of the alternative hypothesis. This suggests that female B.Ed. Trainees' ICT learning capabilities and awareness of ICT are interdependent. In other words, the learning skills in ICT scores grow or decrease as female B.Ed. Trainees' awareness of ICT increases or declines.

- At the 5% significance level, a significant and positive association was established between the acquisition of ICT skills and the attitude toward ICT of female B.Ed. trainees (r=0.7303, p0.05). As a result, the null hypothesis is discarded, and the alternative hypothesis is accepted. This suggests that female B.Ed. Trainees' ICT learning skills and attitudes toward ICT are interdependent. In other words, the learning skills in ICT scores rise or decrease in correlation with the female B.Ed. Trainees' attitude toward ICT.

- At the 5% significance level, a significant and positive association was discovered between female B.Ed. Trainees' awareness and attitude toward ICT (r=0.2937, p0.05). As a result, the null hypothesis is rejected in favor of the alternative hypothesis. That is the attitude toward ICT and the attitude toward ICT

of female B.Ed. Trainees are mutually reinforcing. In other words, the attitude toward ICT scores grows or drops as the attitude toward ICT of female B.Ed. Trainees increases or decrease. Additionally, the correlations were depicted in the Scatter diagram below.

Figure – 4.19: Scatter diagram of relationships between learning skills in ICT, awareness and attitude towards ICT of female B.Ed. trainees



4.5 REGRESSION ANALYSIS

Regression is a statistical technique that predicts unknown values for one variable based on the known values for other variables. The deviation of a suitable mathematical expression of the functional relationship between variables is the subject of regression analysis. This phrase is used to forecast the values of a dependent variable based on the values of the independent variables. Thus, regression analysis is used to investigate the relationship between a variable Y and a set of other variables X1, X2, X3,....., Xn.

Mathematical equations can investigate the relationship between the response variable (Y) and the explanatory variables (X). The most often occurring linear equation is

$$Y=b1X1 + b2X2 + \ldots + bnXn + bo$$

Here, Y is the dependent variable to be predicted, X1, X2, X3,..., Xn are the known variables to be forecasted, b1, b2,..., bn are the regression coefficients for the X1, X2, X3,..., Xn variables obtained from the observed data, and b0 is the constant (Y-intercept).

In this study, the response variable is the learning capabilities in ICT of B.Ed. Trainees (Y). Two variables were used as explanatory variables: awareness of ICT (X1) and attitude toward ICT (X2).

As a result, the model of multiple linear regression becomes

$$Y=b0+b1X1 + b2X2$$

Where,

X1= Awareness of ICT

X2= Attitude towards ICT

Hypothesis - 20:

B.Ed. Students' awareness of ICT and attitude toward ICT are not significant predictors of learning skills in ICT scores.

Multiple linear regression analysis was used to test or validate the hypothesis above, and the findings are reported in the table below.

Table – 4.32

Multiple linear regression of learning skills in ICT scores of B.Ed. trainees with regression coefficient, standard error and t-value as a whole

Independent variables	Regression coefficient	Std. Error Regression coefficient	t-value	p-level
Intercept	1.0616	0.5086	2.0874	0.0375*
Awareness of ICT (X1)	0.1029	0.0192	5.3642	0.0001*
Attitude towards ICT (X2)	0.1994	0.0079	25.1384	0.0001*
$R=0.8249$, $R^2=0.6805$, $F(2,397)=422.92$ $p<0.05$, S, Std. Error of estimate: 2.0835				

The findings imply that,

- The combined effect of awareness of ICT (X1) on learning skills is positive and statistically significant at the 5% level of significance for B.Ed. Trainees' ICT scores. This suggests that the learning skills measured in the ICT scores of B.Ed. Students are influenced by their overall awareness of ICT (X1).

The combined effect of attitude toward ICT (X2) on learning skills in B.Ed. Trainees' ICT scores are favorable and statistically significant at the 5% level of significance. This suggests that the learning skills measured in the ICT scores of B.Ed. Students are influenced by their overall attitude toward ICT (X2).

Thus, the multiple linear regression equation relating learning skills in ICT scores of B.Ed. trainees (Y) to their overall awareness of and attitude toward ICT (X1) and attitude toward ICT (X2) was shown to be negative:

Learning skills in ICT (Y) = 1.0616+0.1029X1+0.1994X2

The linear regression equation's multiple R is 0.8249. The F-ratio (422.92) was significant at the 5% level when used to assess multiple correlation coefficients.

As a result, the null hypothesis is discarded, and the alternative hypothesis is accepted. Significant R indicates that estimate of learning abilities in B.Ed. ICT scores are achievable based on the predictors, namely awareness of ICT (X1) and attitude toward ICT (X2) (X2). Additionally, the regression equation demonstrates that knowledge of ICT (X1) and attitude toward ICT (X2) can be used to predict learning skills in B.Ed. ICT scores. Trainees together.

R2 has a multiple determination coefficient of 0.6805. Thus, roughly 68.05 percent of the difference in learning skills in ICT scores of B.Ed. Trainees for whatever is measured is accounted for by awareness of ICT (X1) and attitude toward ICT (X2). The regression equation's SEest is 2.0835. This means that the regression equation for the sample is used to predict learning abilities in ICT scores of B.Ed. Trainees, the regression equation for the sample is multiplied by 2.0835.

R2 has a multiple determination coefficient of 0.6805. Thus, roughly 68.05 percent of the difference in learning skills in ICT scores of B.Ed. Trainees for whatever is measured is accounted for by awareness of ICT (X1) and attitude toward ICT (X2). The regression equation's SEest is 2.0835. This means that the regression equation for the sample is used to predict learning abilities in ICT scores of B.Ed. Trainees, the regression equation for the sample is multiplied by 2.0835.

Table – 4.33

Relative contribution of awareness of ICT (X1) and attitude towards ICT (X2) on learning skills in ICT scores of B.Ed. trainees as a whole

Independent variables	Beta value	r-value	Beta x r	% of contribution
Awareness of ICT (X1)	0.1615	0.4149	0.0670	6.70
Attitude towards ICT (X2)	0.7567	0.8108	0.6136	61.36
			0.6806	68.06

As indicated in the preceding table, variance accounts for 68.06 percent of the variance in the criterion variable, with 6.70 percent in the variable awareness of ICT (X1) and 61.36 percent in the variable attitude toward ICT (X2), accounting for learning skills in ICT scores of B.Ed. Trainees. Thus, data appears that an attitude toward ICT (X2) contributes more to acquiring skills in B.Ed. Trainees' ICT scores than a general awareness of ICT (X1).

Hypothesis - 21:

The awareness of ICT and the attitude of aided colleges toward ICT B.Ed. Students would not be major predictors of ICT score learning skills.

Multiple linear regression analysis was used to test or validate the hypothesis above, and the findings are reported in the table below.

Table – 4.34

Multiple linear regression of learning skills in ICT scores of aided college B.Ed. trainees with regression coefficient, standard error and t-value

Independent variables	Regression coefficient	Std. Error Regression coefficient	t-value	p-level
Intercept	1.7317	0.5731	3.0214	0.0028*
Awareness of ICT (X1)	0.0819	0.0224	3.6591	0.0003*
Attitude towards ICT (X2)	0.1931	0.0085	22.7573	0.0001*
$R=0.8756$, $R^2=0.7667$, $F(2,197)=323.76$ $p<0.05$, S, Std. Error of estimate: 1.7220				

- The combined effect of ICT awareness (X1) on learning skills is favorable and statistically significant at the 5% level of significance for aided college B.Ed. Trainees' ICT scores. This suggests that their awareness of ICT affects their learning skills in ICT scores for aided college B.Ed. Trainees (X1).

- The combined effect of attitude toward ICT (X2) on ICT scores of aided college B.Ed. Trainees are favorable and statistically significant at the 5% level of significance. This suggests that the attitude of aided college B.Ed. Trainees toward ICT affect their learning skills in ICT scores (X2).

Thus, the multiple linear regression equation describing the learning skills in ICT scores of aided college B.Ed. Trainees (Y) in terms of ICT awareness (X1) and attitude toward ICT (X2) was shown to be negative:

Learning skills in ICT (Y) = 1.7317+0.0819X1+0.1931X2

The linear regression equation's multiple R is 0.8756. The F-ratio (323.76) was significant at the 5% level when used to assess multiple correlation coefficients. Thus, the null hypothesis is rejected in favor of the alternative hypothesis. Significant R indicates that it is possible to estimate learning skills in ICT scores

of aided college B.Ed. Trainees use the predictors, namely awareness of ICT (X1) and attitude toward ICT (X2) (X2). Additionally, the regression equation demonstrates that knowledge of ICT (X1) and attitude toward ICT (X2) may be used to predict learning abilities in ICT scores of aided college B.Ed. Trainees.

R2 has a multiple determination coefficient of 0.7667. Thus, roughly 76.67 percent of the difference in ICT scores of aided college B.Ed. Trainees for whatever is measured is due to awareness of ICT (X1) and attitude toward ICT (X2). The regression equation's SEest is 1.7220. This means that the regression equation for the sample is used to predict learning skills in ICT scores of aided college B.Ed. Trainees, the regression equation for the sample is multiplied by 1.7220.

The relative contributions of independent factors, namely awareness of ICT (X1) and attitude toward ICT (X2), to the acquisition of skills in ICT scores of aided college B.Ed. Trainees were determined and are summarised in the accompanying table.

Table – 4.35

Relative contribution of awareness of ICT (X1) and attitude towards ICT (X2) on learning skills in ICT scores of aided college B.Ed. trainees

Independent variables	Beta value	r-value	Beta x r	% of contribution
Awareness of ICT (X1)	0.1326	0.3918	0.0520	5.20
Attitude towards ICT (X2)	0.8249	0.8665	0.7148	71.48
			0.7667	76.67

As shown in the preceding table, variance accounts for 5.20 percent of the variance in the criterion variable, with 6.70 percent in the variable awareness of ICT (X1) and 71.48 percent in the variable attitude toward ICT (X2), accounting for learning skills in ICT scores of aided college B.Ed. Trainees. Thus, research appears that attitude toward ICT (X2) has a greater impact on acquiring skills in ICT scores of aided college B.Ed. Trainees than awareness of ICT (X1).

Hypothesis - 22:

The awareness of ICT and attitude toward ICT of unassisted college B.Ed. Students would not be significant predictors of ICT scores for learning skills.

Multiple linear regression analysis was used to test or validate the hypothesis above, and the findings are reported in the table below.

Table – 4.36

Multiple linear regression of learning skills in ICT scores of unaided college B.Ed. trainees with regression coefficient, standard error and t-value

Independent variables	Regression coefficient	Std. Error Regression coefficient	t-value	p-level
Intercept	0.2635	0.8715	0.3024	0.7627
Awareness of ICT (X1)	0.1262	0.0316	3.9987	0.0001*
Attitude towards ICT(X2)	0.2073	0.0144	14.4228	0.0001*
$R=0.7819$, $R^2=0.6114$, $F(2,197)=154.99$ $p<0.05$, S, Std. Error of estimate: 2.3836				

- The combined effect of ICT knowledge (X1) on learning skills is favorable and statistically significant at the 5% level of significance for unaided college B.Ed. Trainees' ICT scores. This suggests that their awareness of ICT affects their learning skills in ICT scores for unaided college B.Ed. Trainees (X1).

- The combined effect of attitude toward ICT (X2) on ICT scores of unaided college B.Ed. Trainees are favorable and statistically significant at the 5% level of significance. This suggests that the attitude of unaided college B. Ed. trainees toward ICT affect their learning skills in ICT scores (X2).

Thus, the multiple linear regression equation describing the learning skills in ICT scores of unassisted college B.Ed. Trainees (Y) in terms of ICT awareness (X1) and attitude toward ICT (X2) was determined to be as follows:

Learning skills in ICT (Y) = 0.2635+0.1262X1+0.2073X2

The linear regression equation's multiple R is 0.7819. The F-ratio (154.99) was significant at the 5% level when used to evaluate multiple correlation coefficients. As a result, the null hypothesis is discarded, and the alternative hypothesis is accepted. Significant R indicates that it is possible to estimate learning skills in ICT scores of unassisted college B.Ed. Trainees use the predictors, namely awareness of ICT (X1) and attitude toward ICT (X2) (X2). Additionally, the regression equation demonstrates that awareness of ICT (X1) and attitude toward ICT (X2) may be used to predict learning abilities in unaided college B.Ed. Trainees' ICT scores.

R2 has a multiple determination coefficient of 0.6114. Thus, roughly 61.14 percent of the variation in ICT scores of unassisted college B.Ed. Trainees for whatever is measured is due to awareness of ICT (X1) and attitude toward ICT (X2). The regression equation's SEest is 2.3836. This means that the regression equation for the sample is used to forecast the learning skills in ICT scores of unaided college B.Ed. Trainees, the regression equation for the sample is multiplied by 2.3836.

The relative contributions of independent factors, namely awareness of ICT (X1) and attitude toward ICT (X2), to acquiring skills in ICT scores of unassisted college B.Ed. Trainees were determined and are summarised in the accompanying table.

Table – 4.37

Relative contribution of awareness of ICT (X1) and attitude towards ICT (X2) on learning skills in ICT scores of unaided college B.Ed. Trainees

Independent variables	Beta value	r-value	Beta x r	% of contribution
Awareness of ICT (X1)	0.1914	0.4485	0.0858	8.58
Attitude towards ICT (X2)	0.6902	0.7615	0.5256	52.56
			0.6114	61.14

The above table indicates that variation accounts for 61.14 percent of the variance in the criterion variable, with 8.58 percent in the variable knowledge of ICT (X1) and 52.56 percent in the variable attitude toward ICT (X2). Thus, data shows that attitude toward ICT (X2) has a greater effect on acquiring skills in the ICT scores of unassisted college B.Ed. Trainees than awareness of ICT (X1).

Hypothesis - 23:

Graduated artists' awareness of and attitude toward ICT B.Ed. Students would not be major predictors of ICT score learning skills.

Multiple linear regression analysis was used to test or validate the hypothesis above, and the findings are reported in the table below.

Table – 4.38

Multiple linear regression of learning skills in ICT scores of arts graduated B.Ed. trainees with regression coefficient, standard error and t-value

Independent variables	Regression coefficient	Std. Error Regression coefficient	t-value	p-level
Intercept	1.9403	0.4943	3.9252	0.0001*
Awareness of ICT (X1)	0.0707	0.0211	3.3564	0.0009*
Attitude towards ICT (X2)	0.1913	0.0086	22.2981	0.0001*
R=0.8797, R^2=0.7738,F(2,197)=337.11 p<0.05, S, Std. Error of estimate: 1.5093				

- The combined effect of ICT awareness (X1) on learning skills as measured by ICT scores of arts graduates pursuing a B.Ed. It is shown to be positive and statistically significant at the 5% significance level. This suggests that their awareness of ICT affects their learning skills in ICT scores as arts graduates pursuing a B.Ed (X1).

- The combined effect of attitude toward ICT (X2) on learning skills as measured by ICT scores of arts graduates pursuing a B.Ed. It is shown to be favorable and statistically significant at the 5% significance level. This suggests that the attitude of arts graduates' B.Ed. Trainees toward ICT affect their learning capabilities in ICT scores (X2).

As a result, the multiple linear regression equation for learning skills in ICT scores of arts-graduated B.Ed. Trainees (Y) in terms of ICT awareness (X1) and attitude toward ICT (X2) was determined to be as follows:

Learning skills in ICT (Y) = 1.9403+0.0707X1+0.1913X2

The linear regression equation's multiple R is 0.8797. The F-ratio (337.11) was significant at the 5% level when used to assess multiple correlation coefficients.

As a result, the null hypothesis is discarded, and the alternative hypothesis is accepted. Significant R indicates that estimation of learning abilities in ICT scores of arts graduates pursuing a B.Ed. It is possible to use the predictors, namely awareness of ICT (X1) and attitude toward ICT (X2) (X2). Additionally, the regression equation demonstrates that knowledge of ICT (X1) and attitude toward ICT (X2) can be used to predict learning abilities in ICT scores for arts graduates pursuing a B.Ed.

R2 has a multiple determination coefficient of 0.7738. Thus, roughly 77.38 percent of the difference in ICT scores of arts-graduated B.Ed. Trainees for whatever is measured is due to awareness of ICT (X1) and attitude toward ICT (X2). SEest is 1.5093 for the regression equation. This means that the regression equation for the sample is used to predict learning skills in ICT scores of arts-graduated B.Ed. Trainees, the regression equation for the sample is multiplied by 1.5093.

The relative contributions of independent factors, namely awareness of ICT (X1) and attitude toward ICT (X2), to acquiring skills in ICT scores of arts-graduated B.Ed. Trainees were determined and are summarised in the accompanying table.

Table – 4.39

Relative contribution of awareness of ICT (X1) and attitude towards ICT (X2) on learning skills in ICT scores of arts graduated B.Ed. trainees

Independent variables	Beta value	r-value	Beta x r	% of contribution
Awareness of ICT (X1)	0.1239	0.4508	0.0558	5.58
Attitude towards ICT (X2)	0.8231	0.8723	0.7180	71.80
			0.7739	77.39

As indicated in the preceding table, variance accounts for 77.39 percent of the variance in the criterion variable, with 5.58 percent in the variable awareness of

ICT (X1) and 71.80 percent in the variable attitude toward ICT (X2), accounting for learning skills in ICT scores of arts graduated B.Ed. Trainees. Thus, it appears that attitudes toward ICT (X2) contribute more to the acquisition of abilities in ICT scores of arts graduates pursuing a B.Ed. Then awareness of ICT (X1).

Hypothesis - 24:

Graduated in terms of awareness of ICT and attitude toward ICT in science. B.Ed. Students would not be major predictors of ICT score learning skills.

Multiple linear regression analysis was used to test or validate the hypothesis above, and the findings are reported in the table below.

Table – 4.40

Multiple linear regression of learning skills in ICT scores of science graduated B.Ed. trainees with regression coefficient, standard error and t-value

Independent variables	Regression coefficient	Std. Error Regression coefficient	t-value	p-level
Intercept	0.3807	1.0134	0.3757	0.7076
Awareness of ICT (X1)	0.1244	0.0324	3.8421	0.0002*
Attitude towards ICT (X2)	0.2054	0.0135	15.2313	0.0001*
$R=0.7637$, $R^2=0.5832$, $F(2,197)=137.88$ $p<0.05$, S, Std. Error of estimate: 2.5175				

As may be observed from the results of the preceding table,

- The combined effect of ICT awareness (X1) on ICT scores of science-graduated B.Ed. Trainees are positive and statistically significant at the 5% level of significance. This suggests that their awareness of ICT affects their learning skills in ICT scores as science-graduated B.Ed. trainees (X1).

- The combined effect of attitude toward ICT (X2) on ICT scores of science-graduated B.Ed. Trainees are favorable and statistically significant at the 5% level of significance. This suggests that the attitude of science-graduated B.Ed. Trainees toward ICT affect their learning capabilities in ICT scores (X2).

As a result, the multiple linear regression equation for the learning skills in ICT scores of science-graduated B.Ed. Trainees (Y) in terms of ICT awareness (X1) and attitude toward ICT (X2) were determined to be negative.

Learning skills in ICT (Y) = 0.3807+0.1244X1+0.2054X2

The linear regression equation's multiple R is 0.7637. The F-ratio (137.88) was significant at the 5% level when used to assess multiple correlation coefficients. As a result, the null hypothesis is discarded, and the alternative hypothesis is accepted. Significant R indicates that it is possible to estimate learning skills in ICT scores of science-graduated B.Ed. Trainees use the predictors, namely awareness of ICT (X1) and attitude toward ICT (X2) (X2). Additionally, the regression equation demonstrates that knowledge of ICT (X1) and attitude toward ICT (X2) may be used to predict learning abilities in ICT scores of science-graduated B.Ed. Trainees.

R2 has a multiple determination coefficient of 0.5832. Thus, nearly 58.32 percent of the variation in learning skills in ICT scores of science-graduated B. Ed. trainees for whatever is measured awareness of ICT (X1) and attitude toward ICT (X2) taken together accounts for nearly 58.32 percent of the variation in learning skills in ICT scores of science-graduated B. Ed. trainees for whatever is measured. The regression equation's SEest is 2.5175. This means that the regression equation for the sample is used to predict the learning skills in ICT scores of science-graduated B.Ed. Trainees, the regression equation for the sample is multiplied by 2.5175.

The relative contributions of independent factors, namely awareness of ICT (X1) and attitude toward ICT (X2), to the acquisition of skills in ICT scores of science-

graduated B.Ed. Trainees were determined and are summarised in the accompanying table.

Table – 4.41

Relative contribution of awareness of ICT (X1) and attitude towards ICT (X2) on learning skills in ICT scores of science graduated B.Ed. trainees

Independent variables	Beta value	r-value	Beta x r	% of contribution
Awareness of ICT (X1)	0.1795	0.3043	0.0546	5.46
Attitude towards ICT (X2)	0.7115	0.7430	0.5287	52.87
			0.5833	58.33

As shown in the preceding table, variance accounts for 58.33 percent of the variance in the criterion variable, with 5.46 percent in the variable awareness of ICT (X1) and 52.87 percent in the variable attitude toward ICT (X2), accounting for learning skills in ICT scores of science-graduated B.Ed. Trainees. Thus, it appears that attitude toward ICT (X2) has a greater impact on the acquisition of skills in ICT scores of science-graduated B.Ed. Trainees than awareness of ICT (X1).

Hypothesis - 25:

Male B.Ed. Trainees' awareness of and attitude toward ICT would not significantly predict learning skills in ICT scores.

Multiple linear regression analysis was used to test or validate the hypothesis above, and the findings are reported in the table below.

Table – 4.42

Multiple linear regression of learning skills in ICT scores of male B.Ed. trainees with regression coefficient, standard error and t-value

Independent variables	Regression coefficient	Std. Error Regression coefficient	t-value	p-level
Intercept	2.0019	0.4425	4.5243	0.0001*
Awareness of ICT (X1)	0.0671	0.0183	3.6710	0.0003*
Attitude towards ICT (X2)	0.1900	0.0070	27.2937	0.0001*
$R=0.9060$, $R^2=0.8209$, $F(2,197)=451.59$ $p<0.05$, S, Std. Error of estimate: 1.3301				

As may be observed from the results of the preceding table,

- The combined effect of ICT awareness (X1) on ICT scores of male B.Ed. Trainees are positive and statistically significant at the 5% level of significance. This suggests that their awareness of ICT affects their learning skills in ICT scores for male B.Ed. trainees (X1).

- The combined effect of attitude toward ICT (X2) on ICT scores of male B.Ed. Trainees are favorable and statistically significant at the 5% level of significance. This suggests that the learning abilities of male B.Ed. As measured by their ICT scores, students are influenced by their attitude toward ICT (X2).

As a result, the multiple linear regression equation describing the learning skills in ICT scores of male B.Ed. trainees (Y) in terms of ICT awareness (X1) and attitude toward ICT (X2) was shown to be negative:

Learning skills in ICT (Y) = 2.0019+0.0671X1+0.1900X2

The linear regression equation's multiple R is 0.9060. The F-ratio (451.59) was significant at the 5% level when used to assess multiple correlation coefficients. As a result, the null hypothesis is discarded, and the alternative hypothesis is accepted. Significant R indicates that estimation of learning skills in male B.Ed. Trainees' ICT scores are possible using the predictors, namely awareness of ICT (X1) and attitude toward ICT (X2) (X2). Additionally, the regression equation demonstrates that knowledge of ICT (X1) and attitude toward ICT (X2) can be used to predict learning abilities in male B.Ed. Trainees' ICT scores.

R2 has a multiple determination coefficient of 0.8209. Thus, roughly 82.09 percent of the variation in ICT scores of male B.Ed. Trainees for whatever is measured is due to awareness of ICT (X1) and attitude toward ICT (X2). The regression equation's SEest is 1.3301. This indicates that the regression equation for predicting learning skills in ICT scores of male B.Ed. Trainees are employed, the regression equation is multiplied by 1.3301.

The relative contributions of independent factors, namely awareness of ICT (X1) and attitude toward ICT (X2), to acquiring skills in ICT scores of male B.Ed. Trainees were determined and are summarised in the accompanying table.

Table – 4.43

Relative contribution of awareness of ICT (X1) and attitude towards ICT (X2) on learning skills in ICT scores of male B.Ed. trainees

Independent variables	Beta value	r-value	Beta x r	% of contribution
Awareness of ICT (X1)	0.1162	0.3792	0.0441	4.41
Attitude towards ICT (X2)	0.8639	0.8993	0.7769	77.69
			0.8209	82.09

As shown in the preceding table, variance accounts for 82.09 percent of the variance in the criterion variable, with 4.41 percent in the variable awareness of ICT (X1) and 77.69 percent in the variable attitude toward ICT (X2), accounting for learning skills in ICT scores of male B.Ed. Trainees. Thus, data shows that attitudes toward ICT (X2) relate more to acquiring skills in male B.Ed. Trainees' ICT scores than awareness of ICT (X1).

Hypothesis - 26:

Female B.Ed. Trainees' awareness of and attitude toward ICT would not significantly predict learning skills in ICT scores.

Multiple linear regression analysis was used to test or validate the hypothesis above, and the findings are reported in the table below.

Table – 4.44

Multiple linear regression of learning skills in ICT scores of female B.Ed. trainees with regression coefficient, standard error and t-value

Independent variables	Regression coefficient	Std. Error Regression coefficient	t-value	p-level
Intercept	0.6612	1.0081	0.6559	0.5127
Awareness of ICT (X1)	0.1178	0.0331	3.5551	0.0005*
Attitude towards ICT (X2)	0.2046	0.0149	13.7534	0.0001*
$R=0.7493$, $R^2=0.5615$, $F(2,197)=126.13$ $p<0.05$, S, Std. Error of estimate: 2.6025				

As may be observed from the results of the preceding table,

- The combined effect of ICT awareness (X1) on learning skills in female B.Ed. Trainees' ICT scores are favorable and statistically significant at the 5% level of significance. This suggests that the learning abilities of female B.Ed. As

measured by their ICT scores, students are influenced by their awareness of ICT (X1).

- The combined effect of attitude toward ICT (X2) on ICT scores of female B.Ed. Trainees are favorable and statistically significant at the 5% level of significance. This suggests that the learning abilities of female B.Ed. As measured by their ICT scores, students are influenced by their attitude toward ICT (X2).

Thus, the multiple linear regression equation describing the learning skills in ICT scores of female B.Ed. trainees (Y) in terms of ICT awareness (X1) and attitude toward ICT (X2) was determined to be as follows:

Learning skills in ICT (Y) = 0.6612+0.1178X1+0.2046X2

The linear regression equation's multiple R is 0.7493. The F-ratio (126.13) was significant at the 5% level when used to assess multiple correlation coefficients. Thus, the null hypothesis is rejected in favor of the alternative hypothesis. Significant R indicates that estimation of learning skills in female B.Ed. Trainees' ICT scores are possible using the predictors, namely awareness of ICT (X1) and attitude toward ICT (X2) (X2). Additionally, the regression equation demonstrates that awareness of ICT (X1) and attitude toward ICT (X2) can be used to predict learning abilities in female B.Ed. Trainees' ICT scores.

R2 has a multiple determination coefficient of 0.5615. Thus, roughly 56.15 percent of the variation in learning skills in ICT scores of female B.Ed. Trainees for whatever is measured may be attributed to ICT awareness (X1) and attitude toward ICT (X2). The regression equation's SEest is 2.6025. This means that the regression equation for the sample is used to predict learning skills in the ICT scores of female B.Ed. Trainees, the regression equation for the sample is multiplied by 2.6025.

The relative contributions of independent factors, namely awareness of ICT (X1) and attitude toward ICT (X2), to learning skills in ICT scores of female B.Ed. Trainees were determined in terms of the proportions of variance predicted by each.

Table – 4.45

Relative contribution of awareness of ICT (X1) and attitude towards ICT (X2) on learning skills in ICT scores of female B.Ed. trainees

Independent variables	Beta value	r-value	Beta x r	% of contribution
Awareness of ICT (X1)	0.1755	0.3748	0.0658	6.58
Attitude towards ICT (X2)	0.6788	0.7303	0.4957	49.57
			0.5615	56.15

As shown in the above table, variation accounts for 56.15 percent of the variance in the criterion variable, including 6.58 percent in the variable knowledge of ICT (X1) and 49.57 percent in the variable attitude toward ICT (X2). Thus, data shows that an attitude toward ICT (X2) correlates more to acquiring skills in female B.Ed. Trainees' ICT scores than awareness of ICT (X1).

CHAPTER 5

SUMMARY AND CONCLUSIONS

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5.1 I N T R O D U C T I O N

The inclusion of ICT in professional training institutions is a significant step toward utilizing ICT to prepare the next generation of workers. ICT is the most significant difficulty that teachers, schools, and teacher educators are currently facing. As a pivotal figure in the process of teaching and learning, a teacher's understanding of ICT and ability to use it effectively in teaching-learning has grown in importance for today's teacher.

In the twenty-first century, educational competencies are increasingly considered as being aligned with information and communication technology (ICT). According to Dr. Abdul Kalam, the entire objective of education in a country is to develop and expand human resources' potential and gradually transform it into a knowledgeable society. Each country wishes to develop students who will eventually become knowledge workers in their economy and hence global citizens. There is a requirement for transformation in every aspect of society to accommodate ICT. It possesses the potential to accelerate every sort of development in society. Education is the only way to integrate ICT into society's developmental features. ICT may be utilized to enhance the quality of education, thereby preparing society and its workforce to meet future challenges. It takes sufficient staff to manage and utilize ICT effectively in schools. Emerging technologies can fundamentally alter India's educational system. Only a creative and enthusiastic teacher can successfully integrate contemporary developments in ICT into the classroom.

All educators must recognize that in today's rapidly changing world, pupils must be equipped to deal sensibly with social, economic, and technological developments. The educational environment is changing rapidly and will continue to do so as a result of ICT.

Information and Communication Technologies (ICT) are electronic and/or computerized technologies, as well as linked human interactive materials, that enable users to use them for a variety of teaching and learning processes, as well as for personal usage. Worldwide, educational systems are under increasing pressure to incorporate new information and communication technologies into their curricula to teach students the knowledge and skills necessary for the twenty-first century. The teaching profession is changing away from teacher-centered, lecture-based instruction toward student-centered, interactive learning settings as new technologies emerge.

From a contemporary ICT perspective, exposing student teachers to various components of ICT and their application aspects, with a particular emphasis on educational technology, would ensure that they not only acquire the necessary skills and competencies but also develop a desirable attitude and love for the profession.

If B.Ed students are proficient in the use of ICT, they may use it effectively and efficiently to accomplish curricular objectives. Positive academic experiences will help B.Ed., learners increase their self-efficacy and teaching proficiency. Thus, incorporating technology into the classroom redefines established teacher-student relationships and instructional techniques. Thus, the researcher's objective in this study is to analyze and determine the relationship between the acquisition of skills, awareness, and attitude toward ICT among B.Ed., trainees.

5.2 NEED AND IMPORTANCE OF THE STUDY

Teachers are critical in building today's society and defining the future of educational quality. The development of a country's various sectors is highly dependent on the quality of its instructors. Thus, education systems worldwide are under increasing pressure to leverage new information and communication technologies to impart to pupils the knowledge and skills necessary for success in the twenty-first century.

The teacher's awareness of ICT enables him or her to appreciate and adapt evolving communication technologies and practices. It serves as a guide for developing a high-quality strategy and technology plan. It enables teachers to stay current on new knowledge and skills related to the usage of new digital technologies and resources. As a result, ICT research is required.

ICT encompasses electronic networks comprised of sophisticated hardware and software that are connected via a plethora of technical protocols. ICT is defined as "everything that enables us to obtain information, connect, or maintain an efficient environment through the use of electronic or digital technology." While some authors refer to them as learning technologies, others simply refer to them as technology. ICT is becoming an increasingly pervasive component of the physical and social worlds that young children inhabit. It plays a significant role in the private and professional life of the majority of people, including those who assist the learning and development of young children, whether as parents, family members, caregivers, or early childhood educators. The teacher can interact with pupils of various ages, from infants to adults, as well as with students who have varying abilities and learning difficulties. If a pupil is to be prepared for the future, the instructor must be knowledgeable of current global realities in psychology and technology. Then and only then can teacher trainees mold the next generation. This is where the importance of ICT and attitude among B.Ed trainees come into play.

Any project aimed at enhancing the teaching and learning process must include the teacher. Additionally, if teachers are not actively involved in all phases of ICT integration into the curriculum, they will have minimal influence. Teachers are responsible for determining the most effective instructional uses of ICT in the classroom. In other words, instructors' skills and expertise in the field of ICT, as well as in other academic areas, must be upgraded. Teacher trainees will eventually become teachers, thus it is critical to provide them with ICT skills so they can teach more effectively. As a result, ICT awareness and abilities are becoming increasingly important among B.Ed students.

The role of classroom instruction in the new technology era is shifting toward ICT. Thus, it is desirable for teachers to possess learning abilities, a favorable attitude toward ICT, and an awareness of ICT. In light of this, the researcher conducted a study to determine the relationship between awareness and attitude toward ICT and the acquisition of ICT skills.

5.3 RESTATEMENT OF THE PROBLEM

The problem of the present investigation is "EVALUATION OF UNDERSTANDING AND MINDSET TOWARD ICT ABOUT LEARNING ICT SKILLS AMONG B.ED TRAINEES ".

5.4 OBJECTIVES OF THE STUDY

- To investigate the ICT-related learning abilities, awareness, and attitude toward ICT of B.Ed., trainees.
- To determine the differences in ICT learning capabilities, awareness, and attitude toward ICT between aided and unassisted college B.Ed trainees.
- To ascertain the differences in ICT learning skills, awareness, and attitude toward ICT between Arts and Science degree B.Ed. trainees.
- To determine the differences between male and female B.Ed. students in terms of their ICT learning skills, awareness, and attitude toward ICT.
- To ascertain the difference between B.Ed. trainees who have a low or a high awareness of ICT about their ability to learn ICT skills.
- To ascertain the difference in learning skills in ICT between B.Ed. trainees with a low and a good attitude toward ICT.
- The purpose of this study was to determine the two-way interaction effect of the independent factors (awareness, attitude) on the acquisition of ICT skills by B.Ed. trainees.

- To determine the interaction effect of management type, degree, and gender on the level of awareness (low and high) and attitude (low and high) of B.Ed. trainees' ICT learning skills.
- To ascertain the relationship between the acquisition of ICT skills, awareness, and attitude toward ICT among B.Ed. students.
- To determine the effect of management style (aided and unaided), degree (arts and science), and gender (male and female) on ICT awareness and attitude toward learning.
- To build a regression equation for the acquisition of ICT skills, we used awareness and attitude toward ICT as response factors and awareness and attitude toward ICT as explanatory variables.
- To ascertain the percentage contribution of predictor variables to the growth and acquisition of ICT skills by B.Ed trainees.

5.5 HYPOTHESES TESTED

The following hypotheses have been evaluated using appropriate statistical techniques.

- There is no substantial difference between aided and unassisted college B.Ed trainees in terms of ICT skills acquisition, awareness, and attitude toward ICT.
- There is no substantial difference between Arts and Science graduates of the B.Ed. program in terms of learning ICT skills, awareness, and attitude toward ICT.
- There is no statistically significant difference between male and female B.Ed. trainees in terms of ICT skill acquisition, awareness, and attitude toward ICT.
- There is no significant difference between B.Ed. trainees with low and high awareness of ICT in terms of ICT skill acquisition.
- There is no substantial difference between B.Ed. trainees with a low or a high attitude toward ICT in terms of developing ICT skills.

- There was no significant interaction effect between management styles (assisted and unassisted) and levels of awareness (low and high) on the acquisition of ICT skills by B.Ed. trainees.
- There was no significant interaction effect between degree (Arts and Science) and awareness (low and high) on B.Ed. trainees' acquisition of ICT abilities.
- There was no significant interaction effect between gender (male and female) and awareness (low and high) on B.Ed. trainees' acquisition of ICT abilities.
- There was no significant interaction effect between management styles (Aided and Unaided) and attitudes (low and high) on B.Ed. trainees' ICT skill acquisition.
- There was no significant interaction effect between degree (Arts and Science) and attitude (low and high) on B.Ed. trainees' acquisition of ICT capabilities.
- There was no significant interaction effect between gender (male and female) and attitude (low and high) on B.Ed. trainees' acquisition of ICT skills.
- There was no significant interaction effect between awareness (low and high) and attitude (low and high) on B.Ed. trainees' ability to master ICT skills.
- There is no substantial association between the acquisition of ICT skills, awareness, and attitude toward ICT among B.Ed. trainees.
- There is no substantial association between the acquisition of ICT skills, ICT awareness, and ICT attitudes of aided colleges. Trainees in the B.Ed. program.
- There is no substantial association between the acquisition of ICT skills, awareness, and attitude toward ICT in unaided colleges. Trainees in the B.Ed. program.
- There is no substantial correlation between learning ICT skills, awareness of ICT, and attitude toward ICT among Arts graduates. Trainees in the B.Ed. program.

- There is no substantial association between the acquisition of ICT skills, awareness, and attitude toward ICT among science graduates. Trainees in the B.Ed. program.
- There is no significant association between the acquisition of ICT skills, awareness, and attitude toward ICT among male B.Ed. trainees.
- There is no substantial association between the acquisition of ICT skills, awareness, and attitude toward ICT among female B.Ed. trainees.
- B.Ed. trainees' awareness of ICT and attitude toward ICT are not significant determinants of ICT skill acquisition.
- ICT Awareness and Attitudes of Aided Colleges Trainees in the B.Ed. the program would not be a major predictor of ICT skill acquisition.
- Unaided college students' awareness of and attitude toward ICT Trainees in the B.Ed. the program would not be a major predictor of ICT skill acquisition.
- Arts graduates' awareness of ICT and attitude toward ICT Trainees in the B.Ed. the program would not be a major predictor of ICT skill acquisition.
- Graduated in ICT Awareness and Attitude Towards ICT in Science Trainees in the B.Ed. the program would not be a major predictor of ICT skill acquisition.
- Male B.Ed. trainees' awareness of ICT and attitude toward ICT are not significant determinants of ICT skill acquisition.
- Female B.Ed. trainees' awareness of ICT and attitude toward ICT are not significant determinants of ICT skill acquisition.

5.6 VARIABLES OF THE STUDY

The factors in this study are categorized as Independent, Dependent, and Moderator.

1. Independent Variables

a. Awareness of ICT

b. Attitude towards ICT.

2. Dependent Variable

a. Learning Skills in ICT

3. **Moderator Variables**

a. Gender: It includes both male and female B.Ed trainees.

b. Type of colleges: It includes aided and unaided B.Ed colleges.

c. Degree: It includes Arts and Science B.Ed trainees.

5.7 METHODOLOGY

The descriptive correlation method was applied in this investigation. The link between two or more variables was explored, specifically the extent to which variation in one variable is connected with variation in other variables. Correlation analysis is used to ascertain the relationships between two or more variables. Data are acquired from numerous variables and then analyzed using correlational statistical approaches. The significant factors are selected, and the relationships between them are studied. Correlational research examines a variety of aspects, including the nature of the link between two or more variables, and the theoretical model produced and tested to account for the observed correlation does not imply causality. Thus, correlational research enables the researcher to make only rudimentary causal inferences at most.

5.8 SAMPLING

The current study sampled B.Ed students enrolled in several colleges of education at Chatrapati Sahu Ji Maharaj University Kanpur. A proportionate stratified random sampling procedure was used to choose the sample. The investigator sampled four aided and six unaided B.Ed colleges from a total of 32. A total of 400 B.Ed. students were included in the sample. Which covers both male and female graduate B.Ed trainees in the arts and sciences.

5.9 TOOLS USED FOR COLLECTION OF DATA

The researcher utilized the following tools to collect data in the current study:

1. ICT awareness scale: Developed and standardized by the investigator.

To begin developing the tool titled Information Communication Technology Awareness, the researcher consulted pertinent books and journals and spoke with experts in educational psychology, educational technology, and ICT. Using this background, up to 60 multiple choice test items were developed, as well as specific directions for administering the test, including a time limit. A preliminary test worth 60 points was designed and presented to 100 randomly selected B,Ed trainees. The pupils took around 40 minutes to complete the test. The answer sheets were classified into three categories: high, average, and low. Item analysis was conducted on the High and Low groups. Individual test items are assigned an item difficulty index and item discrimination coefficients. As a result of these two analyses, the following items were deleted: 1,6,9,11,14,17,19,20,23,25,30,32,34,38,40,41,46,49,50, and 57. The final 40 items comprised the test. Additionally, items that were deemed excessively simple or too challenging, as well as those with coefficients less than 0.25, were eliminated. The final test items were ordered according to their degree of difficulty.

The dependability of a test refers to its capacity to produce consistent results across multiple sets of measures. It refers to the degree to which a measuring device produces consistent results when used. The reliability of consistency was calculated using the split-half method and found to be 0.75 (n=100). The test, experts believe, has content validity. The final version of the tool dubbed the information communication technology awareness scale, contains 40 elements, each of which is assigned a single point. Each scoring method offered one point for a correct answer and zero points for an incorrect answer. The maximum possible score is 40, while the least possible score is "0."

2. Attitude towards ICT scale: Attitude towards the ICT scale developed by J. Samuel Gnanamuthu and R. Krishna Kumar was used by the researcher.

3. Learning skills in ICT scale: By the investigator, developed and standardized. To begin developing the tool entitled Learning skills in ICT, the researcher consulted relevant books and journals and spoke with experts in educational psychology, educational technology, and ICT. Using this background, up to 40 multiple choice test items were developed, as well as specific directions for administering the test, including a time limit. A preliminary test worth 40 points was designed and presented to 100 randomly selected B,Ed trainees. The pupils took around 30 minutes to complete the test. The answer sheets were classified into three categories: high, average, and low. Item analysis was conducted on the High and Low groups. Individual test items are assigned an item difficulty index and item discrimination coefficients. The entries numbered 1, 2, 4, 8, 13, 14,17, and 18 were removed as a result of these two analyses. The remaining 32 items comprised the final examination. Additionally, items that were deemed excessively simple or too challenging, as well as those with coefficients less than 0.25, were eliminated. The final test items were ordered according to their degree of difficulty.

The dependability of a test refers to its capacity to produce consistent results across multiple sets of measures. It is a term that relates to the degree to which a measuring device produces consistent results when used. The reliability of consistency was calculated using the split-half method and found to be 0.69 (n=100). The test, experts believe, has content validity. The final version of the tool, dubbed the Learning skills in ICT scale, contains 32 components, each of which carries a single point. Each scoring method offered one point for a correct answer and zero points for an incorrect answer. The maximum possible score is 32, and the minimum possible score is "0."

5.10 STATISTICAL TECHNIQUES USED FOR THE ANALYSIS OF DATA

The investigator gathered data and processed it statistically using the SPSS 20.0 software suite.

- **t-test:** This is used to find out the mean difference between two groups.
- **Two-way ANOVA:** This is used to find out the interaction effect of independent variables on the dependent variable. Two-factor analysis of variance followed by Tukey's multiple posthoc procedures for comparisons of different groups.
- **Correlation analysis:** This is used to find out the relationship between Independent and Dependent variables.
- **Multiple regression analysis:** This is used to find out the influence of independent variables on the dependent variable.

5.11 FINDINGS OF THE STUDY

- There is no discernible difference between assisted and unaided colleges. B.Ed. students in terms of their ICT learning abilities, awareness, and attitude toward ICT
- There is a substantial difference between arts and science graduates of the B.Ed program in terms of their ICT learning abilities, awareness, and attitude toward ICT.
- There is a considerable difference between male and female B.Ed students in terms of ICT skill acquisition, awareness, and attitude toward ICT.
- There is a considerable difference between B.Ed trainees who have a poor understanding of ICT and those who have a high awareness of ICT in terms of their ICT learning skills.
- There is a considerable difference in learning capabilities in ICT between B.Ed trainees with a low and a high attitude toward ICT.
- There is a substantial interaction effect between management styles (Aided and Unaided) and awareness levels (low and high) on B.Ed. trainees' acquisition of ICT abilities.
- There is a strong interaction effect between degree (Arts and Science) and awareness (low and high) on B.Ed. trainees' acquisition of ICT abilities.
- There is a substantial interaction effect between gender (male and female) and awareness (low and high) on B.Ed. trainees' ability to master ICT skills.
- There is a substantial interaction effect between management styles (Aided and Unaided) and attitudes (low and high) on B.Ed. trainees' ICT skill acquisition.
- There is a substantial interaction effect between degree (Arts and Science) and attitude (low and high) on B.Ed. trainees' acquisition of ICT abilities.

- There is a substantial interaction effect between gender (male and female) and attitude (low and high) on B.Ed. trainees' ability to master ICT skills.
- There is a substantial interaction effect between awareness (low and high) and attitude (low and high) on B.Ed. trainees' ability to learn ICT skills.
- There is a considerable and favorable association between the acquisition of ICT skills, awareness, and attitude toward ICT among B.Ed. students.
- A significant and favorable association exists between the acquisition of ICT skills, as well as the awareness and attitude of aided college students toward ICT. Trainees in the B.Ed. program.
- A significant and favorable association exists between the acquisition of ICT skills, awareness of ICT, and an unaided college's attitude toward ICT. Trainees in the B.Ed. program.
- There is a considerable and favorable association between the acquisition of ICT skills, awareness, and attitude toward ICT among Arts graduates with a B.Ed.
- A significant and favorable association exists between the acquisition of ICT skills and the graduate's awareness and attitude toward ICT. Trainees in the B.Ed. program.
- A significant and positive association exists between male B.Ed. trainees' acquisition of ICT skills, awareness, and attitude toward ICT.
- There is a substantial and favorable association between gaining ICT skills, awareness of ICT, and female B.Ed. trainees' attitude toward ICT.
- B.Ed. students' awareness of and attitude toward ICT were found to be favorable and significant predictors of ICT skill acquisition.
- ICT Awareness and Attitudes of Aided Colleges B.Ed. students were found to be both positive and significant predictors of ICT skill acquisition.

- Unaided college students' awareness of and attitude toward ICT B.Ed. students were found to be both positive and significant predictors of ICT skill acquisition.
- The awareness of ICT and the attitude toward ICT of Arts-graduated B.Ed. trainees were found to be significant predictors of ICT skill acquisition.
- The awareness of ICT and the attitude toward ICT of science-graduated B.Ed. trainees were found to be important predictors of ICT skill acquisition.
- Male B.Ed. trainees' awareness of ICT and attitude toward ICT were found to be favorable and significant determinants of ICT skill acquisition.
- Female B.Ed. trainees' awareness of ICT and attitude toward ICT were found to be favorable and significant determinants of ICT skill acquisition.

5.12 CONCLUSIONS

The researcher has drawn the following conclusions based on the findings of the study:

B.Ed. students in aided and unaided universities demonstrate comparable learning abilities, awareness of, and attitudes toward ICT. In comparison to B.Ed trainees with an arts degree, those with a science degree demonstrate significantly greater levels of learning capabilities, awareness, and attitude toward ICT. Female B.Ed students have much greater levels of learning capabilities, awareness, and attitude toward ICT than male B.Ed students.

B.Ed trainees with a high level of awareness and a positive attitude toward ICT have significantly superior learning skills in ICT than B.Ed trainees with a low level of awareness and a negative attitude toward ICT. B. Ed. trainees with low and high awareness of ICT (gender, type of college, and type of degree) have varying levels of ICT learning skills; B. Ed. trainees with low and high attitude

toward ICT have varying levels of ICT learning skills, and B. Ed. trainees with low and high awareness and attitude toward ICT have varying levels of ICT learning skills.

Significant and favorable relationships were discovered between the acquisition of skills and the awareness and attitude toward ICT of B.Ed trainees. Between assisted and unaided B.Ed trainees, a significant and favorable link was discovered in terms of ICT learning skills, awareness, and attitude toward ICT. Between arts and science-graduated B.Ed trainees, a significant and favorable association was discovered in terms of ICT skill acquisition, awareness, and attitude toward ICT. Between male and female B.Ed trainees, a significant and favorable link was discovered regarding the acquisition of ICT abilities, awareness, and attitude toward ICT. As a result of this, we can deduce that as awareness and attitude rise, so do learning abilities among B.Ed., trainees.'

Awareness of ICT and attitude toward ICT are the best predictors of B.Ed trainees' learning skills in ICT in aided and unassisted institutions and attitude toward ICT contributes more to B.Ed trainees' learning skills in ICT than awareness of ICT. Awareness of ICT and an attitude toward ICT are the best indicators of arts and science graduates' ability to acquire ICT skills. B.Ed trainees and their attitude toward ICT contribute more to the development of ICT skills in arts and science graduates than does awareness of ICT. Male and female students' awareness of ICT and attitude toward ICT are the best predictors of their ability to develop ICT skills. Male and female B.Ed trainees' attitudes toward ICT relate more to their ability to gain ICT skills than their awareness of ICT.

5.13 EDUCATIONAL IMPLICATIONS

The following educational implications may be suggested in light of the study's findings. The following are some guidelines and suggestions for teacher educators and educational institutions to consider in this regard.

ICT awareness

- As part of their pre-service training, B.Ed. learners will receive an ICT course.
- During their practice teaching, teacher trainees should be provided opportunities to use PowerPoint presentations or multimedia presentations.
- The establishment of proper instructional and physical facilities for ICT integration should be made mandatory in all teacher education institutes.
- The practicum on integrating ICT into teaching and learning may be incorporated in all stages of teacher education.
- More ICT-related courses should be offered to aspiring teachers, and each ICT-related course should be practice-based.
- Teachers must have enough access to functional computers and receive suitable technical support to properly use them. The majority of academic professionals require an ICT-enabled teaching environment.
- Teacher educators should be adequately taught through certified in-service opportunities, and learning settings should be fully equipped with the bare minimum technological resources essential.
- Each trainee should have the opportunity to work with ICT devices.
- Allow students to utilize ICT equipment for their project work.
- Introduce a variety of software applications to computers and other electronic devices.
- They should be aware of useful websites for their project work, assignments, and so forth.
- B.Ed students must be taught how to use significant search engines and websites to research their academic papers.
- To the benefit of persons with impairments, information will be delivered in a dual communication method.
- To encourage open learning systems to offer information technology-related courses to people with disabilities.
- Special attention and further coaching can be provided to B.Ed students to increase their awareness of ICT.

- Physical and infrastructure facilities for enhancing ICT knowledge among B.Ed trainees may be provided at B.Ed colleges.
- Provision should be made for B.Ed trainees to manage educational resources such as the internet, e-mail, and video conferencing.
- Motivate them to attend various seminars and workshops on the incorporation of ICT into the curriculum.

2. Attitude towards ICT

- Training institutions should offer ICT workshops and use creative teaching approaches to foster a positive attitude toward technology.
- Teacher educators should be able to include ICT into their instruction to foster a good attitude toward ICT among B.Ed trainees.
- Teacher educators and administrators should create a good attitude toward ICT in preservice teachers.
- Expose them to a positive global competitive environment that fosters quality-based attitudes in their future teaching processes.
- Crash courses, particularly in ICT applications, might be conducted to help B.Ed trainees develop a more positive attitude.
- Workshops on contemporary ICT tools may be conducted to familiarise teacher trainees with various creative ideas and methodologies, hence improving their attitude toward ICT.

3. Learning skills in ICT

- Teacher educators must provide opportunities for teacher trainees to create PowerPoint presentations on assigned topics, which may motivate them to improve their learning skills.
- All teacher training centers should have access to online learning. It will improve B.Ed trainees' positive attitudes and learning abilities.
- A session on modern ICT tools should be held for B.Ed students to help them improve their learning skills.

- Teachers' training institutions should provide ICT labs to assist trainees in developing their learning skills.
- Using ICT will aid in the development of self-directed learning skills among B.Ed students.
- Teacher education institutions must provide leadership for pre-and in-service teachers and serve as role models for innovative pedagogies and learning tools.
- Colleges should offer orientation training sessions regularly to ensure that the maximum number of users can increase their excellence or proficiency in the use of ICT for academic purposes.
- Teacher education curriculum content should be world-class and globally relevant, combining world-class resources and instructional strategies for learning and teaching and maximizing global relevance and exposure in various development areas.

5.14 LIMITATIONS OF THE STUDY

- The study focused exclusively on B.Ed students at Chatrapati Sahu Ji Maharaj University Kanpur.
- The study was limited to Chatrapati Sahu Ji Maharaj University Kanpur's aided and unaided B.Ed colleges.
- The study enrolled 400 B.Ed. students from Chatrapati Sahu Ji Maharaj University Kanpur.
- The study examined only three variables: awareness of ICT, attitude toward ICT, and acquisition of ICT skills.
- The study considers the gender, kind of college, and degree (arts or science) of B.Ed trainees as moderate variables.

5.15 SUGGESTIONS FOR FURTHER RESEARCH

- A comparable study might be conducted with primary and secondary school teachers, university lecturers, B.Ed teachers, M.Ed students, and university professors.

- Additionally, the study can be expanded to include demographic characteristics such as location, socioeconomic level, and so on.
- A similar study might be conducted on government college B.Ed students.
- The study may be reproduced with a larger sample size by taking into account additional characteristics such as location, socioeconomic position, and personality.
- Comparative analyses of several professional courses are possible.
- Experimental studies may be conducted to aid in the development of ICT-related learning skills.
- Multimedia packages on ICT can be used to conduct studies.
- Comparative research on online and offline learning with ICT may be conducted.

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