Essentials of Educational Technology

Meena Kumari

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TABLE OF CONTENTS

List of Figures ..... *xi*
List of Tables ..... *xiii*
List of Abbreviations ..... *xv*
Preface ..... *xvii*

Chapter 1 Introduction of Educational Technology: Meaning, Nature, and Scope 1
1.1. Introduction 2
1.2. Origin and History 3
1.3. Educational Technology (ET): Meaning and Definitions 4
1.4. Nature and Characteristics of Educational Technology (ET) 8
1.5. Scope of Educational Technology (ET) 10
1.6. Significance of Educational Technology (ET) 14
1.7. Components of Educational Technology (ET) 18
1.8. Three Types of Educational Technology (ET) 20
1.9. Educational Technology (ET) Trends 21
1.10. How Important Is Technology in Education? 24
1.11. What Is Instructional Technology? 28

Chapter 2 Concept of Communication and Instruction 33
2.1. Introduction 34
2.2. Concepts of Communication 34
2.3. Definition 36
2.4. Nature of Communication 37
2.5. Purpose of Communication 40
2.6. Importance of Communication 42
2.7. Principles of Communication 43
2.8. Process of Communication 44
2.9. Communication Models 47

2.10. Educational Communication 54
2.11. Business Communication Channels 57
2.12. Barriers of Communication 60
2.13. Overcoming Communication Barriers 65
2.14. Classroom Communication 67

Chapter 3 Concepts of Teaching-Learning 73
3.1. Introduction 74
3.2. Concept of Teaching 74
3.3. Theories of Teaching 78
3.4. Models of Teaching 82
3.5. Concept of Learning 86
3.6. Learning Process 93
3.7. Principles of Learning 100
3.8. Difference Between Teaching and Learning 102

Chapter 4 Micro-Teaching 107
4.1. Introduction 108
4.2. Meaning of Micro-Teaching 108
4.3. Definition and Basic Concepts 110
4.4. Procedure of Micro-Teaching 112
4.5. Micro-Teaching Phases 114
4.6. Steps and Requirements of Micro-Teaching 115
4.7. Key Strengths of Micro-Teaching 118
4.8. Some Characteristics of Micro-Teaching 121
4.9. Underlying Principles of Micro-Teaching 122
4.10. Merits and Demerits of Micro-Teaching 124

Chapter 5 Use of ICT in Education 127
5.1. Introduction 128
5.2. Significance of ICT in Education 128
5.3. Benefits of ICT in Education 130
5.4. Role of ICT in 21st Century's Teacher Education 136
5.5. Barriers and Solutions 142
5.6. Factors Influencing the Use of ICT 146

5.7. Teacher Attitudes, Perceptions, and Confidence in ICT Use 147
5.8. Role of ICT in Improving Quality of Education 149
5.9. Role of ICT in Improving Quality of Higher Education 160

Chapter 6 E-Learning and Virtual Classrooms 167
6.1. Introduction 168
6.2. Meaning of E-Learning 168
6.3. Types of E-Learning 171
6.4. Advantages and Disadvantages of E-Learning 172
6.5. Benefits of E-Learning for Learners, Instructors, and Managers 175
6.6. E-Learning-Success Factors for Organizations Using E-Learning 179
6.7. E-Learning: A Panacea in the Time of COVID-19 Crisis 180
6.8. Virtual Classrooms 189

Chapter 7 Distance Education 195
7.1. Introduction 196
7.2. What Do We Mean by Distance Education? 196
7.3. Defining Distance Education 199
7.4. Distance Education: Generations 201
7.5. Key Concepts and Trends in Distance Education 205
7.6. Learner in Distance Education 216
7.7. Culture in Distance Education 217
7.8. Advantages and Disadvantages of Distance Learning 220
7.9. Distance Education: The Future 223

Bibliography 227

Index 231

LIST OF FIGURES

Figure 1.1. Educational technology is the science of tactics and procedures for achieving educational goals

Figure 1.2. Distance education

Figure 1.3. Collection of information

Figure 1.4. The section of collaborative learning

Figure 1.5. High-tech approaches to teaching

Figure 1.6. Instructional technology can include anything from electronic whiteboards to online courses and even virtual reality classes

Figure 1.7. Applications of instructional technology

Figure 2.1. Communication necessitates a thorough awareness of the sender's and receiver's behavior, as well as any potential hurdles

Figure 2.2. Communication aids in better understanding individuals by eradicating misunderstandings and promoting clarity of ideas and speech

Figure 2.3. Purpose of communication

Figure 2.4. Communication process

Figure 2.5. The transmission model of communication

Figure 2.6. The interaction model of communication

Figure 2.7. The transaction model of communication

Figure 2.8. Diverse modes of communication have varied levels of channel richness

Figure 3.1. Teaching and learning are inextricably related

Figure 3.2. Training is used much less frequently than conditioning or indoctrination

Figure 3.3. Learning is a passive process of memorizing information that requires an external reward

Figure 3.4. Characteristics of learning

Figure 4.1. Micro-teaching is a mechanism for training inexperienced or experienced teachers in the art of teaching by practicing certain skills through "scaled down teaching encounters," i.e., minimizing the difficulties of real typical teaching in terms of class size, duration, and material

Figure 4.2. Role of feedback in micro-teaching

Figure 4.3. Procedure of micro-teaching

Figure 4.4. Phases of micro-teaching

Figure 4.5. Various phases involved in a micro-teaching activity

Figure 4.6. Teaching ladder-10 steps to make effective teaching

Figure 4.7. Steps in a micro-teaching cycle

Figure 5.1. The advancements in ICT have resulted in advancements in the execution of tasks and activities

Figure 5.2. There is a need to raise the bar for ICT infrastructure in schools, particularly in rural areas

Figure 5.3. Role of ICT in 21st century education

Figure 5.4. With the advancement of technology, students, and teachers have developed a greater capacity for rational and logical thought

Figure 5.5. ICT in teacher education

Figure 5.6. Role of ICT in improving higher education

Figure 6.1. E-learning

Figure 6.2. Agriculture, medicine, education, services, business, and government establishments are all adapting to the concept of E-learning, which aids in the advancement of a nation

Figure 6.3. Types of e-learning

Figure 6.4. SWOC analysis

Figure 7.1. Distance education is now available online, on-demand, and to anyone

Figure 7.2. Distance education in the first generation sought to broaden the scope of education by including those who were less fortunate and lacked access to educational resources and institutions (Anderson and Simpson, 2012)

Figure 7.3. Power is a psychological construct that is related to and influenced by learner variables such as attitude, emotional maturity, cognitive style, self-concept, and motivational level

Figure 7.4. Social presence in distance education

Figure 7.5. Theory of connectivism

Figure 7.6. Open educational resources (OERs) movement

Figure 7.7. Learning analytics (LA) can assist administrators and policymakers in identifying areas for improvement and making more informed resource allocation decisions

Figure 7.8. Culture in distance education

Figure 7.9. Challenges of distance learning

LIST OF TABLES

Table 2.1. Major types of business communication channels
Table 3.1. Models of information processing
Table 3.2. Social models
Table 3.3. Personal models
Table 3.4. Models in the behavior family
Table 3.5. Comparison between teaching and learning
Table 6.1. An overview of natural disaster that affected teaching-learning badly

LIST OF ABBREVIATIONS

AECT	Association for Educational Communications and Technology
AR	Augmented Reality
CBT	Computer-Based Training
CCTV	Closed Circuit Television
CMC	Computer-Mediated Communication
CSCL	Computer-Supported Collaborative Learning
ET	Educational Technology
HOT	Higher Order Thinking
LA	Learning Analytics
MIS	Management Information Systems
NCL	Networked Collaborative Learning
OER	Open Educational Resources
WBT	Web-Based Training

PREFACE

The way we live has undoubtedly altered as a result of technological advancements. It has touched numerous elements of life and changed what it means to live. Without a doubt, technology plays a significant influence in every aspect of life. Numerous manual chores can be mechanized as a result of technological advancements. Additionally, many complicated and crucial tasks may be completed more easily and efficiently with the aid of contemporary technology. Living has changed for the better as a result of the application of technology. Education has been transformed by technological advancements. The significance of technology in education cannot be overstated. Indeed, with the advent of computers in education, both teachers and students have found it easier to transfer knowledge. The use of technology has enhanced the enjoyment of teaching and learning.

Today, more than ever, educational technology (ET) plays a critical role in teaching, owing to the widespread use of information and communication technologies. They recognize the value of educational technology through the use of various distant education applications, the Internet, teachers, and students themselves. The question is whether schools and teachers are prepared for and aware of the benefits of technology in education.

This book will provide an overview of the value and application of educational technology. Educational technology is becoming more prevalent in the classroom. The new generation of children is prepared to work with these new technologies, which play a critical role in children's learning and acquisition of diverse cognitive information, necessitating the incorporation of educational technology into future curriculum. The use of instructional technology improves students' abilities and cognitive traits. With the aid of new technology, there has been an explosion of learning and knowledge acquisition, particularly on mobile devices. In recent years, teachers have incorporated new technologies into the classroom. However, the development and deployment of new technology continue to accelerate, raising the question of whether teachers are adequately prepared to keep up.

The purpose of this book is to equip students with the information and skills necessary to comprehend the organizational and institutional demands and requirements for educational technology. The book will serve as a reference for educators and a textbook for a certificate, master's, and doctoral programs in educational technology, instructional systems, and learning design.

Chapter 1

Introduction of Educational Technology: Meaning, Nature, and Scope

CONTENTS

1.1. Introduction 2
1.2. Origin and History 3
1.3. Educational Technology (ET): Meaning and Definitions 4
1.4. Nature and Characteristics of Educational Technology (ET) 8
1.5. Scope of Educational Technology (ET) 10
1.6. Significance of Educational Technology (ET) 14
1.7. Components of Educational Technology (ET) 18
1.8. Three Types of Educational Technology (ET) 20
1.9. Educational Technology (ET) Trends 21
1.10. How Important Is Technology in Education? 24
1.11. What Is Instructional Technology? 28

1.1. INTRODUCTION

This is a technological era in which we are applying scientific techniques to solve problems and improve our lives. However, we are utilizing technology to make teaching and learning easier, simpler, and more comprehensive. This technology is referred to as educational technology (ET), and it helps learners advance by saving time and energy and supporting them gradually.

ET is a topic of study that focuses on the process of assessing, designing, developing, implementing, and evaluating the educational environment and instructional materials with the goal of enhancing teaching and learning. It is critical to remember that ET (also known as instructional technology) exists to improve education. Additionally, instructional technology can be viewed as a technique for resolving educational difficulties and concerns, which may include motivation, discipline, the dropout rate, school violence, fundamental skills, and critical thinking, among others. To begin, the problem is identified; then, the problem's elements are analyzed; and finally, viable solutions to the problem are provided. Following that, the student population and curriculum are assessed. The following stage is to determine the most effective instructional tactics for the given situation. Following that, instructional materials and resources are chosen that are appropriate for the curriculum and method of instruction. Finally, the program is implemented, assessed, and amended as necessary to ensure that it achieves the specified school development goals.

Today's educational materials have significantly expanded as a result of numerous technology advancements. Instructional materials include more traditional items such as the blackboard, overhead projectors, televisions, VCRs, overhead projectors, slide projectors, and opaque projectors, as well as more modern items such as the computer, varied software applications, LCD projectors, camcorders, digital cameras, scanners, the Internet, satellite, interactive television, audio, and video conferencing, and artificial intelligence, and so on.

Teachers in public schools and university faculty members must understand the types of materials viable, how to use them, why they should be used, when they should be used, and how to integrate them into the teaching/learning environment in order to achieve the ultimate goal of improving education. Additionally, teachers must consider the impact that these newer materials may have on what and how we learn and teach. Technology can be used to sustain a teacher-led, knowledge-based approach to learning or to assist us in implementing a student-centered, constructivist,

and progressive approach. We need to assist teachers in grasping the broader picture of how technology has the potential to revolutionize education. Simply instructing teachers on how to use technology will result in the enhancement of a knowledge-based educational system. By exposing them to the true potentials of technology, we can foster higher-order thinking, self-directed learning, and lifelong learning.

Teachers face a plethora of skills and issues. These are concepts that university faculty must grasp in order to incorporate them into their own teaching and thus help preservice teachers grasp them in order to more effectively incorporate technology into their own instruction. Bear in mind that in each of these areas of ET, the primary goal is to improve a specific aspect of teaching and learning. The technology is chosen to assist us in accomplishing these goals. This chapter presents an introduction to ET.

1.2. ORIGIN AND HISTORY

Education is a discipline that is both science and art. It is a combination of learning science and teaching art. Technology, on the other hand, refers to the methodical application of scientific principles in the form of tools, machines, and other knowledge to achieve a goal that, as a result of use, can design and construct new gadgets that enhance human productivity while also solving difficulties. As a result, technology is used for human progress and as a problem-solving invention. In terms of vocabulary and structural composition, ET may carry out two main components, namely education and technology.

We are concentrating here on the evolutionary nature of the second component, namely technology, as a subject is solely concerned with the task of identifying the most suitable, appropriate, and developed technology (both hardware and software) for serving the educational needs and purposes of students and society at a specific time and place. It is no secret that there has been a constant change in the nature of the use of technologies as means and measures for improving the effectiveness and products of education based on the level of excellence attained by members of society and communities all over the world in terms of scientific, philosophical, psychological, and technological progress and advances. As a result, we can see a constant shift in the modes and means of ET being employed to serve the cause of education throughout human history and civilization. In the early period of human history, when writing was unknown, the approach of verbal presentation by teachers and citation and memorizing by students

was a regular practice in practically all of the world's civilizations. The oral teaching tradition maintained by the ancient sages in the Gurukuls and Socrates' teacher-pupil oral dialogue system widespread in the west may be considered as evidence of the employment of applicable technology in the field of teaching-learning at a specific epoch in the history of human civilization.

With the introduction of writings as a method and materials of communication, such as writing on leaves and tree trunks, engraving on metals and rocks, and then the use of some form of paper and ink material, the next breakthrough in the use of writing technology for teaching and learning occurred. In the future, it will give a significant push in the field of teaching and learning, as evidenced by the utilization of subject content available in the form of printed materials and textbooks, as well as a significant scientific and technological improvement.

The use of writing and printing technologies then advanced the cause of teaching and learning by being used in the production and usage of instructional materials such as chalkboards, photographs, charts, models, maps, diagrams, and other graphic material.

As industrial development and technological improvement progressed, sophisticated scientific instruments, mass media, and instructional materials were utilized. It ushered in the usage of advanced hardware and software in the field of education, such as radio, television, tape recorder, films, transparency, and so on.

The theory and notion of programmed instruction. Later, another layer was given to the meaning and notion of instructional technology. This was expanded once again with the introduction of new methodologies such as system approach, microteaching, interaction, analysis, and computer assisted training.

1.3. EDUCATIONAL TECHNOLOGY (ET): MEANING AND DEFINITIONS

Technology encompasses both processes and technical devices. A methodical approach to utilizing techniques to attain a goal is just as vital as the use of technical equipment. In reality, procedures are considered the software of technology, whereas equipment is considered the hardware. New designs and devices, as well as new concepts and procedures, are created as a result of technological advancements. Each new physical gadget comes

with its own set of methods and techniques. For example, the evolution of the telephone has resulted in phone books, answering machines, fax, and telephone shopping, and so on. The hard component (physical device) is used for research. Educate the act or process of obtaining and transmitting information is critical to a learner's development with a view to his/her participation in the transformation of the world for a better tomorrow. Learning and comprehension are fundamental to the definition of education. ET is more than just a combination of these two words. It is commonly looked on as more than the sum of the two interpretations listed below:

- Technology in education; and
- Technology of education.

Early advancements discussed the role of technology in education, which refers to the employment of audiovisual equipment, i.e., hardware, in instructional processes. Later advancements acknowledge the notion of ET, i.e., approaches, and methodologies of the teaching-learning process. This is the software component of instructional technology. The history of software is intertwined with the history of courseware, which is the instructional design and development of a subject (Figure 1.1).

Figure 1.1. Educational technology is the science of tactics and procedures for achieving educational goals.

Source: https://th.bing.com/th/id/R.b7f50db41c55d48b1bf5c007106e413b?rik=jilq3hZwlOz%2f2w&riu=http%3a%2f%2fmedia2.govtech.com%2fimages%2f1170*785%2f09-Flickr-Internet-of-Things-Education-Technologies.jpg&ehk=%2b125%2bjrLgwZsz49R5WwIaYK1%2f5m9nRvmbM0knu0Dv4g%3d&risl=&pid=ImgRaw&r=0.

It is useful for storing, transferring, and increasing knowledge by applying appropriate instruments and techniques such as computers, television, CDs, and so on. As a result, ET employs a variety of machines such as television, radio, tape recorder, video tapes, and concepts of engineering, physical sciences, and behavioral science to improve the teaching and learning process of education. ET is concerned with:

- The study of instructional tasks/challenges and the establishment of educational objectives.
- Selection and building of appropriate machine, tools, and instruments.
- Selection and application of appropriate methodologies for running the machine/devices to achieve the educational goal.
- Combination of scientific and technological abilities/techniques with acceptable behavioral outcomes.
- Several definitions of instructional technology have evolved over time. Let us go over them in order to gain a better understanding of the word "educational Technology."

The invention, application, and assessment of systems, techniques, and aids to improve human learning is referred to as ET (United Kingdom National Council for Educational Technology) (NCET, 1967).

It is the application of modern skills and techniques to the educational and training requirements (Unwin and Derik, 1969).

The application of scientific information about learning and learning conditions to increase the efficacy and efficiency of teaching and learning is referred to as ET (Leith, 1975).

The successful use of technological instruments in learning is referred to as ET. It is a concept that considers fundamental theoretical viewpoints for the appropriate application of a variety of instruments, such as media, machines, and networking devices.

Richey (2008) defines ET covers a wide range of media that offer text, audio, graphics, animation, and streaming video, as well as technology applications and processes such as audio or video tape, satellite TV, CD-ROM, computer-based learning, and local intranet/extranet and web-based learning. Many e-learning processes are supported by information and communication technologies, which can be stand-alone or dependent on local networks or the Internet in networked learning (Tavangarian, Leypold, Nölting, and Röser, 2004).

- "Educational Technology is the application of scientific process to man's learning conditions."—**Robert A. Cox**
- "Educational Technology is the form of detailed application of psychology of learning to practical teaching problems"—**John P. Dececco**
- "Educational Technology is that branch of educational theory and practice concerned primarily with the design and use of messages which control the learning process."—**E. E. Hadden**
- "Educational Technology is concerned to provide appropriately designed learning situations which, holding in view of objectives of the Teaching of Training, being to bear the best means of instruction."—**Richmond**
- "Educational Technology may be defined as the application of the laws as well as recent discoveries of science and technology to the process of education."—**S. S. Kulkarni**
- "Educational Technology can be conceived as a science of techniques and methods by which educational goals could be realized."—**S. K. Mitra**
- "The application of scientific process to man's learning conditions is what has come recently to be called 'educational or instructional' technology."—**Robert A. Cox**
- "Educational Technology is the development, application, and evaluation of systems, techniques, and aids in the field of human learning."—**D. E. S. Working Party (UK)**
- **Robert M. Gange** defined Educational Technology as "The Development of asset of systematic techniques and accompanying practical knowledge for designing, testing, and operating schools as educational systems."

Richey described ET as "the research and ethical practice of supporting learning and enhancing performance by inventing, implementing, and managing appropriate technological processes and resources" (Richey, 2008). The Association for Educational Communications and Technology (AECT) defines instructional technology as "the idea and practice of designing, developing, utilizing, managing, and evaluating learning processes and resources" (Randy and Terry, 2003).

ET, according to UNESCO, is a communication process that results from the application of scientific approaches to the behavioral science of teaching and learning. This communication may or may not necessitate the use of media such as television broadcasts, radio broadcasts, cassettes, and so on.

1.4. NATURE AND CHARACTERISTICS OF EDUCATIONAL TECHNOLOGY (ET)

1.4.1. The Nature of Educational Technology (ET)

- The foundation of educational technology is science.
- Educational technology is concerned with the impact of science and technology on education. In other words, educational technology incorporates science and technology. As a result, it is a practical aspect of science.
- Educational technology is a dynamic, progressive, and effect-producing method that is ever-changing.
- Only educational technology, such as programmed learning, micro-teaching, simulated teaching, interaction analysis, videotape, tape-recorder, projector, and computer, allows for new ideas.
- Educational technology recognizes schools as a system. In this system, the school building, furniture, and teachers serve as input, while numerous methods, tactics, strategies, and teaching and examination using audio-visual aids operate as a process. Finally, the output is in the form of the students' ability.
- Audio-visual aids are not educational technology. It is because it is only concerned with the process of educational technology rather than the input and output elements. However, if these A.V. aids are employed to fulfil educational goals, they fall under the category of educational technology.
- Programmed Instruction is not the same as Educational Technology. The fundamental reason for this is that the student learns themselves while following the programmed instructions. It does not allow for interaction between the student and the teacher.
- As a result, it can only be used for specific goals and subject matter. As a result, programmed instruction is only a subset of educational technology.
- Engineering technology is not educational technology because engineering technology has produced radios, tape recorders, videotapes, and televisions, among other things, which are utilized in classrooms as audio-visual aids, but engineering technology is

still distinct from educational technology. It is solely approved as a hardware technique in education.

- Educational technology cannot fix all of education's problems. It can only be utilized successfully in a teaching and learning system.
- Some people believe that educational technology will eventually replace teachers, rendering them unemployed. It is their mistake. The instructor will never be replaced by educational technology. This is because of three aspects of educational technology. They are: (i) input; (ii) process; and (iii) output.

Because input is the teacher's duty, ET cannot take the position of a teacher. Despite this, instructional technology only promotes the cognitive domain, not the affective domain. Affective domain can only be established by interaction between teachers and students. As a result, instructional technology cannot replace teachers. The goal of technological education is to improve learning efforts. Both hardware and software techniques are used in ET.

According to Garrison (1989), "technology will be seen here as having both a process (software) and a product (hardware) component, where process is the creative application of knowledge of purposeful activities." Media is a subset of hardware, and media are the instruments used to distribute information."

In ET, hardware includes televisions, computers, overhead projectors, tape recorders, and teaching machines, among other things. Audio/video cassettes, Filmstrips, micro films, slides, and other types of software are examples of software.

ET is all-encompassing. It is related with all parts of the educational process-methods, teaching tactics, learning materials, equipment handling, and so on.

The four major components of educational technology are as follows:

- **Methods:** It focuses on devices such as programmed learning, team teaching, micro-teaching, and personalized system of instruction in teaching learning scenarios.
- **Materials:** Instructional materials, such as a programmed text book, can be handwritten or printed.

- **Media:** Audio, visual, or audiovisual media are utilized here. Radio, tape recorder, charts, films, educational television, and so on are a few examples.
- **Manpower:** Manpower has complete control over educational technologies. Without humans, educational technology is a non-starter.

1.4.2. Characteristics of Educational Technology (ET)

The following are the characteristics of educational technology:

- It is formed on scientific and technological progress;
- It is primarily a practical discipline rather than a theoretical one;
- It is a modern discipline that is rapidly expanding;
- It applies research findings from psychology, sociology, engineering, science, and social psychology, among other disciplines, to the field of education;
- It effectively brings together students, teachers, and technical resources;
- It is the science of methods and techniques. It identifies and addresses educational problems, with the ultimate goal of improving the educational system;
- It will undoubtedly benefit the teacher, the learner, and the teaching-learning process.

1.5. SCOPE OF EDUCATIONAL TECHNOLOGY (ET)

As you know, ET is utilized to improve educational efficiency. However, as time passes, the educational system is confronted with new challenges. As a result, ET hardware and software are always evolving. As a result, the application of instructional technology is considerably broader than it was a few decades ago. The following are some noteworthy ET applications.

1.5.1. Mass Education

There has been a population and knowledge surge. As a result, there is a need to educate the general public. The situation is exacerbated by the presence of a large number of illiterate persons. As a result, ET has a significant application for educating a big number of people and imparting a large amount of knowledge in a short period of time. In this regard, the mass

media, such as radio and newspapers, as well as other modern technologies such as computers and information technology (e-mail, internet, and so on), have a lot of potential. With the support of new teaching and learning methods and practices, the illiterate masses can also become literate.

1.5.2. Historical Information

Every field of knowledge that we deal with has a historical foundation. Such material is critical for students to comprehend any branch of knowledge in its entirety. When such situations occur, they can be captured using an audio video cassette or documented in the form of written or printed content. Such documents serve as a source of knowledge for students to learn from. The fundamental advantage of such materials is that we cannot recreate or reproduce history no matter how hard we attempt to present it to the students. Can we, for example, show our students the identical view of the Hiroshima and Nagasaki (1946) explosion? This is not both practicable and possible. As a result, such records in the form of a film taken at the time of the incident are of enormous value to the learners, which ET can only supply.

1.5.3. Costly and Hazardous Experiments

There are several experiments in various sectors of science and technology that have significant implications for effective learning but are not appropriate for the teacher to undertake in the classroom due to the cost and health risks involved. Such experiments, if carefully carried out in the laboratory or elsewhere, can be recorded and used by teachers and students for effective learning using new electronic technologies.

1.5.4. Simulation and Gaming

If historical events are either too expensive or too dangerous to recreate, ET can save the day by simulating them. In this aspect, computer technology is crucial. This can create a realistic three-dimensional image of occurrences. It can also demonstrate the action of several aspects of a phenomenon as well as the repercussions. Games are another option. Many topics that cannot be taught in the formal setting of the classroom can be learned by children through play. ‘Gaming and simulation have a wide range of applications in the training of military personnel and in the realm of aviation.’

1.5.5. Distance Education

ET offers a wide range of applications in distance education and open school programs. Today, there is a huge demand for frequent people training and education in order to stay current in one's sector of work. Distance education programs, which are a less formal form of education, have gained increasing prominence in this regard. ET, with its innovative practices, can teach students who are unable to attend traditional classroom settings. Programmed learning materials, modules, contact programs, and counselling are among advances that can assist distant learners in this area (Figure 1.2).

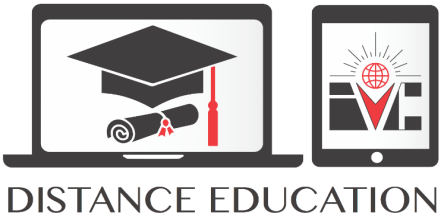

Figure 1.2. Distance education.

Source: https://www.imperial.edu/ivc/images/Distance_Education/DE_Logo.png.

1.5.6. Collection, Storing, and Retrieval of Information

Certain cameras allow us to take images of events that occur in a fraction of a second, events that occur in a remote location, and events that cannot be seen with the naked eye. There are also satellites that function around the clock to give us with information about regions that are inaccessible to us. This innovative electronic technology allows for the collection of information in both audio and visual formats. Such information can be accurately stored on magnetic and electronic devices and recovered in a short period of time (Figure 1.3).

Figure 1.3. Collection of information.

Source: https://innovativeadagency.com/blog/importance-data-collection/.

1.5.7. Research

As previously stated, information can be collected and maintained for educational purposes. In the same way, information can be collected and preserved for research purposes. Technology can also be employed for analysis and reporting. Not only quantitative data, but also qualitative data, may be studied, and here is where the computer and other data analysis tools and procedures come into play. Furthermore, in developmental research, many types of packages can be designed to improve the effectiveness of learning. Many studies have already been undertaken in this subject, such as the development of programmed learning materials, computer-assisted training, and computer-assisted language learning packages. With the advantages of the internet, website, and a learner desiring to question or find out something that is happening elsewhere might have access to a vast amount of information sitting at home. While at home, he can float hypotheses, problems, and ideas and solve them. The study findings are not only shared during this procedure, but the research quality can also be improved.

ET is a process-oriented technique. ET is not restricted to the teaching and learning process and theories; nonetheless, ET has a considerably greater influence on the teaching-learning process. Only because of ET have theories switched from learning to teaching.

If ET is limited to audio-visual aids, mechanical, and electronic gadgets, the scope of ET is narrowed; nevertheless, ET is not limited to all of these things; rather, it pervades all aspects of life. ET should be used in the following areas:

- At home;
- Managed with the support of others;
- Rigorous task analysis;
- Direct behavior specification;
- Prerequisite determination and increasing direct behavior;
- A precise description of the problem;
- Hindrance in solving problems;
- Management and organization of people, materials, and resources;
- The availability of a few media such as cinema, television, radio, and so on;
- Developing software technology.

1.6. SIGNIFICANCE OF EDUCATIONAL TECHNOLOGY (ET)

1.6.1. Access to Variety of Learning Resources

In the era of technology. Education Technology (ET) provides a wealth of resources to improve teaching and learning abilities. It is now possible to provide audio visual education with the help of ET. The learning resources are becoming increasingly diverse. With this vivid and extensive technique now included in the ET curriculum, students are encouraged to view computers as tools to be used in all aspects of their studies. They must, in particular, use new multimedia technologies to communicate ideas, describe projects, and organize information in their work.

1.6.2. Immediacy of Information

ET has made education more accessible. In this day and age of computers and web networks, the pace of imparting knowledge is extremely rapid, and one can be educated at any time and from any location. New information technology is frequently introduced into well-established patterns of working and living without fundamentally altering them. For example, despite the fact that typewriters have been replaced by personal computers, the traditional

office, with secretaries working at keyboards and notes written on paper and manually exchanged, has remained remarkably stable.

1.6.3. Anytime Learning

In this day and age of computers and web networks, the pace of imparting knowledge is very fast, and one can be educated. One can study whenever he wants, whether it is day or night, and whether he is in India or the United States, because of the boom in ET.

1.6.4. Collaborative Learning

ET has now made it simple to study and teach in groups or clusters. We can collaborate online to complete the task at hand. Efficient postal systems, the telephone (fixed and mobile), and various computer-based recording and playback systems all play a role in educational broadcasting in the new millennium. Many children in developed countries and among educational elites elsewhere are now familiar with the Internet and its web sites, but it remains of little significance to many more who lack the most basic means of subsistence (Figure 1.4).

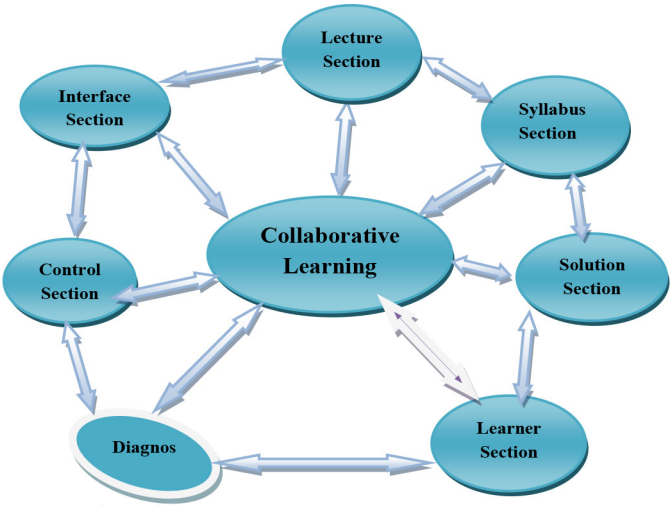

Figure 1.4. The section of collaborative learning.

Source: https://www.researchgate.net/publication/270338413/figure/fig3/AS:393465675436035@1470820935152/Shows-the-section-of-collaborative-learning.png.

1.6.5. Multimedia Approach to Education

Audio-Visual Education, the planning, preparation, and use of devices and materials for educational purposes that involve sight, sound, or both. Still and motion images, filmstrips, television, transparencies, audiotapes, records, teaching machines, computers, and videodiscs are among the devices employed. The expansion of audio-visual education has mirrored advancements in both technology and learning philosophy. According to studies in learning psychology, the use of audiovisuals in teaching has various advantages. Perception, the process through which the senses gather information from their surroundings, underpins all learning. The higher processes of memory and concept creation are unable to achieve without preceding perception. People can only pay attention to a certain quantity of information at one time, and their choice and perception of information is influenced by previous experiences. Other things being equal, researchers discovered that receiving information concurrently in two senses (visual and hearing, for example) is more effective than receiving it in a single mode. Furthermore, learning is facilitated when content is arranged and visible to the pupil. These findings point to the importance of audio-visual aids in the instructional process. They can aid perception of the most significant elements, be meticulously arranged, and force the student to employ more than one modality.

1.6.6. Authentic and Up-to-Current Information

The information and data available on the internet are completely correct and up to date. The Internet, a collection of computer networks that adhere to common standards and allow computers and the programs that run on them to interact directly, offers genuine and correct information.

1.6.7. Online Library

The Internet supports thousands of different operational and experimental services, one of which is the online library. This internet library has a wealth of information. Learners are encouraged to view computers as instruments to be used in all aspects of their studies as part of the IT curriculum. They must, in particular, use new multimedia technologies to express ideas, describe projects, and organize information in their job. This necessitates them selecting the optimal media for delivering their message, structuring information in a hierarchical fashion, and linking information together to create a multidimensional document.

1.6.8. Distance Learning

Distance learning is a type of learning that takes place outside of a classroom. Late-20th-century communications technologies, most recently multimedia and interactive, give up new opportunities for an unprecedented growth of home-based learning, much of it part-time, on both an individual and institutional level. Within the backdrop of a continuing communications revolution, the term distance learning was established, essentially replacing a previously confused mixed nomenclature—home study, independent study, external study, and, most commonly, albeit limited in pedagogical means, correspondence study. In response to complaints that remote learning is an unsatisfactory substitute for learning alongside people in formal institutions, the combination of increased demand for access to educational facilities and innovative communications technology has been increasingly exploited. Reduced costs per student have been a strong motivator.

At the same time, students who study at home save money on travel and other expenses. Whatever the reasoning, distance learning widens access for students unable for whatever reason (course availability, geographical remoteness, and family circumstances, individual disability) to study alongside others. Simultaneously, it appeals to students who choose to learn at home. Furthermore, it appeals to professional and business education organizers by offering an incentive to reconsider the most effective approach of presenting critical information.

1.6.9. Improved Access for Impaired Children

Information technology has drastically changed the lives of disabled children. ET provides a variety of applications and techniques to teach these impoverished folks. People who are severely deaf from birth are unable to learn to talk unless they receive specific training at a young age. Deafness from birth results in extreme sensory deprivation, which can have a substantial impact on a person's intellectual capability or ability to learn. A child who develops a hearing loss early in life may not receive the same level of language stimulation as youngsters who can hear. Up to the age of seven, the essential era for brain plasticity exists. Failure of acoustic sensory input at this stage leads to failure of synaptic connection formation and, perhaps, an irreversible predicament for the infant.

A deaf child's academic progress may be slower than that of hearing youngsters due to a delay in learning language. Scholastic lag is typically cumulative; thus, a deaf adolescent may be four or more academic years

behind his or her hearing peers. Deaf children who receive early linguistic stimulation through sign language, on the other hand, perform academically on par with their hearing peers. The incorporation of information technology into teaching is critical to ensuring the quality of the educational system.

There are two equally compelling justifications for incorporating information technology into the classroom. Pupils must get familiar with the usage of information technology because all employment in the future society will be dependent on it, and information technology must be employed in education to improve its quality and effectiveness.

Specific significances are:

- Access to a wide range of learning resources;
- Instant access to knowledge;
- Anytime learning;
- Anywhere learning;
- Collaborative learning;
- Multimedia approach to education;
- Authentic and up-to-date information;
- Access to online libraries;
- Educational data storage;
- Distance education;
- Access to the source of knowledge;
- Different communication channels-e-mail, chat, forum, blogs, etc.;
- Access to open courseware;
- Improved access to children with disabilities.

1.7. COMPONENTS OF EDUCATIONAL TECHNOLOGY (ET)

ET consists primarily of two components: hardware and software. For the effective application of ET, both hardware and software are required. For example, an interactive computer program is useless unless it is accompanied by an educational program. Both hardware and software complement one another.

1.7.1. Hardware

Hardware refers to ET that uses electronic devices based on scientific principles and techniques. Its roots are in Physical Sciences and Applied Engineering, and it is founded on the concept of Service. It takes a product-focused approach. It is concerned with the creation and use of audio-visual aid materials [such as charts, models, slides, filmstrips, audio cassettes, and so on], sophisticated instruments and gadgets [such as radio, television, films, projectors, tape-recorders, video players, teaching machines, computers, and so on], and mass media. For its operation, hardware technology makes use of software technology products [such as teaching strategies, teaching learning material, and so on].

Hardware technology has the potential to bring educational benefits to the masses with greater ease and economy. However, excessive use of technical gadgets may mechanize the teaching-learning process as the Hardware approach tries to enter education from the outside, operating more in isolation than in combination.

1.7.2. Software

Software refers to ET that entails the systematic, scientific application of appropriate scientific research from physical science, social science such as psychology and sociology, philosophy, management studies, and so on to solve educational problems. It is also known as Teaching Technology, Instructional Technology, or Behavior Technology. Its roots are in behavioral sciences and the applied aspects of learning psychology. It is a methodical approach. It employs knowledge of the Psychology of Learning to create learning material, teaching-learning tactics, and so on for the improvement of the teaching-learning process. It does not provide direct services to its users. Instead, it aids in the creation of numerous software materials that are employed in the development of hardware appliances. It consists of teaching methodologies, learning materials, evaluation tools, teaching models, and programmed training, among other things.

Software technology does not require any assistance from hardware technology to be delivered. When aided by hardware technology, it becomes more useful and productive. When compared to hardware technology, software technology has less general appeal and is more expensive in the long term.

1.8. THREE TYPES OF EDUCATIONAL TECHNOLOGY (ET)

The successful use of technological instruments in learning is referred to as ET. As a Concept, it considers fundamental theoretical viewpoints for the appropriate application of a variety of tools, such as media, machines, and networking devices.

1.8.1. Synchronous and Asynchronous

Learning can take place both inside and outside of the classroom. It can be self-paced and asynchronous, or it can be instructor-led and synchronous. It is appropriate for distance learning as well as in conjunction with face-to-face instruction, which is referred to as blended learning. Learners and instructors in homes, schools, corporations, and other settings can use virtual classrooms to collaborate effectively online.

The exchange of ideas and information with other participants over the same time period is referred to as synchronous learning. Face-to-face discussion, online real-time live teacher instruction and feedback, Skype discussions, and chat rooms or virtual classrooms where everyone is online and working cooperatively at the same time are just a few examples. Because students are working together, synchronized learning encourages them to keep an open mind because they must listen to and learn from their peers. Synchronized learning promotes online awareness and helps many students enhance their writing skills.

Asynchronous learning may make use of technologies such as email, blogs, wikis, and discussion boards, as well as web-based textbooks, hypertext texts, audio, and video courses, and social networking. Students in asynchronous online courses work at their own pace. If they need to listen to a lecture again or ponder about a subject for a while, they can do so without worry of delaying the remainder of the class. Students can acquire their credentials faster or redo failing courses without the embarrassment of being in a class with younger students by taking online courses. Students can choose from a wide range of courses, internships, sports, and jobs while still graduating with their class.

1.8.2. Linear Learning

Self-paced learning activities delivered on a computer or handheld device such as a tablet or smartphone are referred to as computer-based training

(CBT). CBT was first supplied by CD-ROM and often presented content linearly, similar to reading an online book or manual. As a result, CBT is frequently used to teach static tasks such as utilizing software or solving mathematical equations. CBT is essentially similar to web-based training (WBT), which is provided over the internet using a web browser.

Assessments that can be easily scored by a computer, such as multiple-choice questions, drag-and-drop, radio button, simulation, or other interactive means, are frequently used to assess learning in a CBT. Assessments are simply assessed and recorded using web software, which provides end-user feedback and completion status in real time. Completion records in the form of certificates are frequently available to users.

CBT goes beyond standard learning methodologies such as textbooks, manuals, and classroom-based education to give learning stimulation. Because rich media, such as films or animations, may be incorporated to increase learning, CBT can be an excellent alternative to printed learning materials.

1.8.3. Collaborative Learning

Computer-supported collaborative learning (CSCL) utilizes instructional methods designed to promote or require students to work together on learning tasks. CSCL is conceptually comparable to the terms "e-learning 2.0" and "networked collaborative learning" (NCL).

Sharing information amongst several people in a network has gotten much easier, and utilization has expanded, thanks to technological Web 2.0 developments. One of the primary reasons for its use is because it serves as a "breeding ground for creative and compelling educational activities."

Using Web 2.0 social tools in the classroom enables students and teachers to collaborate, exchange ideas, and spread information. The collaboration tools equip students with the technological abilities required in today's workforce.

1.9. EDUCATIONAL TECHNOLOGY (ET) TRENDS

Today's technology is assisting teachers in expanding their teaching beyond traditional text-based learning and engaging students in hands-on learning experiences. Education is becoming more technologically advanced. Everything that happens in the realm of technology has a direct impact on education and learning systems. Why this is unavoidable, and how our

instructors, students, and education systems as a whole will stay up, is a major problem. In this section, we will discuss six high-tech approaches to teaching (Figure 1.5):

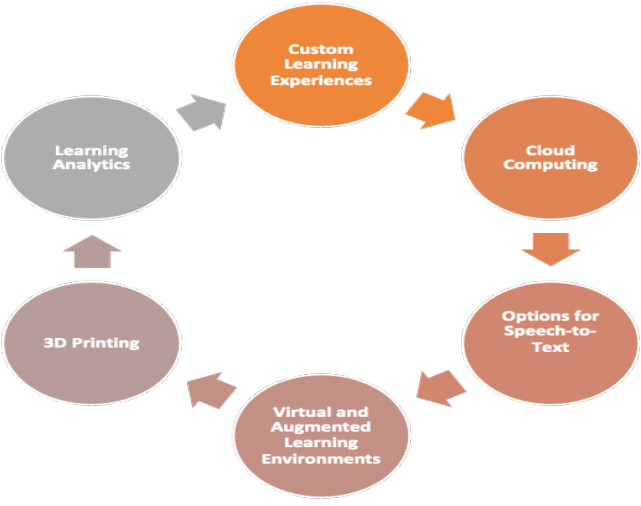

Figure 1.5. High-tech approaches to teaching.

- **Custom Learning Experiences:** Learning approaches and experiences should never be the same for everyone, yet previous education systems were unable to support the custom learning experience due to too many constraints. We can truly begin personalized teaching and learning techniques and experiences in our current educational infrastructure thanks to new educational technologies. With current gadgets and interfaces, it is now possible to begin learning according on one's need, preference, and availability.
- Instead of a one-size-fits-all approach to classroom education, the introduction of mobile apps for education has ushered in a new era of need-based learning. For example, a junior surgeon can now use his smartphone app to obtain instruction for a key procedure during an operation.
- **Cloud Computing:** More than any other technology, has opened the door to high-tech education. Because information stored in the cloud servers of the apps was accessible at any time and from any location, courseware, and instructional resources could be accessed from any device and from any location. You can

continue reading a book and work on assignments with other students and teachers using any device and at any time. Aside from the convenience of access and cooperation, cloud-based education apps also solved the problem of data storage.

- **Options for Speech-to-Text:** The great majority of devices and app platforms now have virtual assistant apps and functionalities, such as Apple's Siri. Such intelligent assistants that respond to voice instructions make learning easier. Furthermore, the speech-to-text capability, which is included on most devices, helps taking notes and writing faster and more comfortable.
- **Virtual and Augmented Learning Environments:** Virtual and augmented reality (AR) have provided a significant boost to online education. Because of VR and AR, students may have an engaging learning experience without having to move their legs too much. You can float in space as a background voice depicts the Milky Way in detail if you wish to learn about space objects simply by streaming a 3D space film on your VR headgear. Similarly, real-time broadcasting of crucial surgical operations provides medical students with a more immersive learning experience.
- **3D Printing:** Also known as prototyping, provides students with a more concrete and tactile learning experience. Thanks to 3D printers, a student may quickly mold his idea of an object. Students can use 3D printing to give their ideas reality. 3D printers will only help students release their creative ideas and gain more hands-on experience in any institution.
- **Learning Analytics (LA):** Because of the rapid adoption of high-tech in the educational system, learning data is becoming increasingly crucial in driving judgments and making decision-making procedures easier. As it becomes increasingly vital to analyze and evaluate student engagement, traction, and learning output, the massive volume of education information and data gives birth to LA. We may expect to see LA notifying teachers about particular concerns, students about deadlines and their progress, and so on in the near future. Learning systems will eventually govern how education is delivered by teachers and experienced by students. More than anything else, LA will increase learner engagement in education.

These six high-tech approaches have completely transformed the traditional approach to schooling. Simply put, technology has given teachers and students a new and improved means of connecting during the learning process.

1.10. HOW IMPORTANT IS TECHNOLOGY IN EDUCATION?

According to the International Society for Technology in Education, many of today's high-demand jobs were created in the recent decade. As technological advancements drive globalization and digital change, teachers can assist students in acquiring the skills needed to succeed in future employment.

1.10.1. What Role Does Technology Play in Education?

The COVID-19 pandemic is swiftly illustrating why online education is an important aspect of teaching and learning. Teachers can utilize online learning as a valuable educational tool by integrating technology into existing curricula rather than using it purely as a crisis-management tool.

The proper use of digital learning technologies in the classroom can boost student engagement, assist teachers in improving lesson ideas, and enable personalized learning. It also assists pupils in developing critical 21st-century abilities.

Virtual classrooms, video, AR, robots, and other technology tools can not only make class more interesting, but they can also create more inclusive learning environments that foster collaboration and inquisitiveness while also allowing teachers to collect data on student performance.

However, it is crucial to remember that technology is a tool for education, not an end in itself. The promise of ET lies in what educators do with it and how they use it to best meet the needs of their students.

1.10.2. Educational Technology (ET) Challenges

According to BuiltIn, 92% of teachers recognize the role of technology in education. According to Project Tomorrow, 59% of middle school students believe that digital instructional tools have improved their grades and test results. According to the World Economic Forum, the ET market will grow to $342 billion by 2025 as a result of the popularity of these tools. However, ET is not without its difficulties, notably in terms of implementation and use. According to Project Tomorrow, despite increased interest in the usage

of AR, artificial intelligence, and other emerging technology, less than 10% of schools report having these tools in their classrooms. Concerns regarding excessive screen time, the effectiveness of instructors' use of technology, and concerns about technology equity are also raised.

The question of content has emerged prominently as a result of the COVID-19 crisis. Educators must be able to create and comment on online educational content, particularly to encourage students to evaluate a topic from multiple perspectives. The immediate actions performed during this crisis did not provide for enough time for this. Access is also a challenge; for example, not every school district has the resources to supply students with laptop computers, and internet connectivity in homes might be unstable.

Furthermore, while some students excel in online education settings, others lag due to a variety of circumstances, including a lack of support services. A student who has previously struggled in face-to-face situations, for example, may suffer much more in the current circumstance. These pupils may have relied on services that are no longer available to them.

Nonetheless, studies have shown that when students have the means, they are generally confident in using online education. However, online education may provide difficulties for teachers, particularly in areas where it has not previously been the norm.

Despite the obstacles and concerns, it is crucial to recognize the positives of technology in education, such as better cooperation and communication, higher educational quality, and exciting classes that help ignite students' imagination and search for knowledge.

1.10.3. The Benefits of Technology in Education

Teachers strive to increase student performance, and technology can assist them in doing so. To address the issues, administrators should assist teachers in developing the skills required to improve student learning through the use of technology. Furthermore, technology in the classroom should make instructors' tasks easier while without adding extra time to their day.

Technology gives students with fast access to knowledge, accelerated learning, and enjoyable opportunities to put what they have learned into practice. It allows students to learn about new disciplines and increase their comprehension of complex concepts, which is very useful in STEM. Students can learn 21st-century technical skills for future careers by using technology both inside and outside the classroom.

Nonetheless, children learn more efficiently when they are directed. According to the World Economic Forum, while technology can assist young students learn and acquire knowledge through play, evidence suggests that learning is most successful when guided by an adult, such as a teacher.

Leaders and administrators should assess where their faculty is in terms of their grasp of online environments. They can now apply solutions for the future based on the lessons learnt throughout this turbulent period. Administrators, for example, should allow teachers a week or two to carefully consider how to teach previously unavailable online courses. Flexibility is essential during these tough times, in addition to an examination of options.

The examples below demonstrate the importance of technology in education and the benefits it provides to students and teachers:

- **Collaboration and Communication have Improved:** Collaboration can be aided by ET. Teachers can interact with students during lessons, but students can also speak with one another. Students collaborate to solve challenges through online lessons and learning games. Students can share their views and ideas and encourage one another in collaborative tasks. Simultaneously, technology allows for one-on-one connection with professors. Students can ask questions about the classroom and get extra help with difficult-to-understand subject matter. Students can submit homework from home, and teachers can access and view completed assignments on their laptops.
- **Personalized Learning Opportunities:** Access to educational resources is now possible 24 hours a day, seven days a week, thanks to technological advancement. Classes can be completed totally online using a laptop or mobile device. Learning that is hybrid combines the use of technology from anywhere with regular in-person classroom sessions. It is possible to employ technology to adapt learning strategies for individual student in both cases. Lessons can be designed by teachers based on student interests and strengths. Another advantage is that students can learn at their own pace. Students can review videos in the lesson plan when they need to study class material to gain a better understanding of key ideas. Teachers can use the data provided by these online activities to discover which pupils struggled with certain courses and offer further help and support.

- **Curiosity Driven by Engaging Content:** Teachers can encourage children's curiosity and inquisitiveness through interesting and instructive content, which has been linked to academic performance according to study. Curiosity aids students' grasp of arithmetic and reading skills. AR, videos, and podcasts may all be used to create compelling content. Students, for example, can include videos or engage with students from all over the world while submitting homework.
- **Improved Teacher Productivity and Efficiency:** Teachers may use technology to boost their productivity, incorporate valuable digital tools to extend students' learning opportunities, and increase student support and involvement. It also allows teachers to improve their teaching methods and personalize their students' learning. Schools can profit from technology by lowering the cost of physical instructional materials, increasing the efficiency of educational programs, and making the most use of instructor time.
- **Become a Leader in Enriching Classrooms through Technology:** Educators who are unfamiliar with some of the technology used in education may not have been introduced to the tools as part of their professional development or as part of their preparation for their jobs. Teachers who want to make the change and learn how to use technology in the classroom can take advantage of learning opportunities to develop their skills. Individuals interested in assisting in the transformation of the education system through technology can pursue a Master of Arts in Teaching or a Master of Arts in Education Policy and Leadership from American University's School of Education Online, which provides educators with the necessary tools to become leaders. Courses like Education Program and Policy Implementation and Teaching Science in Elementary School provide graduate students with crucial competencies for effectively integrating technology into educational settings.

Technology is now widely used in classrooms. Computers are now so widely available that they have largely replaced the usage of pen and paper in many classrooms. While public opinion on the use of technology in schools is varied, professionals have discovered that technology has the potential to produce dramatic changes in teaching and learning, opening up unparalleled opportunities for collaboration, involvement, and support.

The key is learning how to use technology in meaningful ways, which some education degree programs are emphasizing in their courses.

1.11. WHAT IS INSTRUCTIONAL TECHNOLOGY?

The theory and practice of employing technology for education are referred to as instructional technology. Instructional technology can take many forms, as it encompasses the design, development, usage, management, and assessment of technology in education (Figure 1.6).

Figure 1.6. Instructional technology can include anything from electronic whiteboards to online courses and even virtual reality classes.

Source: https://th.bing.com/th/id/R.2482fccac28934ba9dd396124f6c9501?rik=AgMaBcxwO408oA&riu=http%3a%2f%2f27jbloggers.pbworks.com%2ff%2f1245445100%2fInstructionalTech.gif&ehk=Imp7GDU8lUetgfSQePD8KMf%2bp9AJ7DTXdv88eqAnRLA%3d&risl=&pid=ImgRaw&r=0.

While the applications and benefits of instructional technology differ greatly, they all serve the same purpose: to provide interesting and effective learning experiences. Many instructional technology applications have shown to be effective in reaching this goal. Experts generally agree that instructional technology delivers numerous benefits to the educational process, including improved access to knowledge, increased chances for collaboration, and improved capacities for serving the requirements of various learners.

1.11.1. The Function of Technology in Today's Classrooms

Teachers utilized relatively little (if any) technology in the classroom just a few decades ago. Technology is becoming an essential component of the educational process. According to a recent MidAmerica Nazarene University research, students use paper and pencil for less than 42% of their work, both in and out of the classroom. Furthermore, the study discovered that 73% of teachers reported their students use tablets or computers on a daily basis.

The growing use of technology in the classroom reflects a larger cultural shift. Tech literacy is becoming increasingly crucial as the modern world gets more computerized. Teachers who utilize technology to enhance learning in meaningful ways can help students succeed in the digital age.

1.11.2. Instructional Technology Applications

According to the United States Schools can employ ET to assist both teaching and learning by filling the classroom with important digital resources, expanding course offerings, enhancing student engagement, and accelerating learning, according to the Department of Education. Although there are practically limitless possibilities for instructional technology, experts have identified three main areas where incorporating technology can have a substantial influence (Figure 1.7).

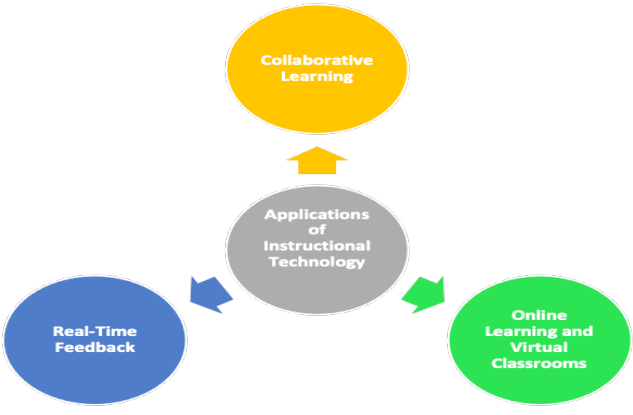

Figure 1.7. Applications of instructional technology.

1. **Collaborative Learning:** It is made possible by instructional technology in ways that have never been seen before. Technology advancements have made exchanging information easier than ever before. Today's educators have access to digital tools that

enable students to collaborate outside of the classroom, debating ideas or completing assignments remotely, removing limits such as regular classroom hours or physical location.

Outside of the actual classroom, instructional technology allows students to collaborate with teachers by discussing concepts or asking questions. Teachers, for example, may host digital office hours, making themselves available via instant messaging or video chat to help students with their homework for the day.

2. **Online Learning and Virtual Classrooms:** Virtual classrooms can be beneficial at all levels of schooling. One typical problem of the traditional classroom environment is that students learn at their own rate, thus teachers must find a way to adjust their lesson plans to the average learner rather than addressing the specific needs of each student.

   Online courses level the playing field and give students the time and resources they need to build the skills they require. Students, for example, may listen to a lecture a second time if they did not immediately get the subject matter or go on to the next one if they rapidly grasped a particular issue. Furthermore, online learning gives students access to a broader range of topics, allowing them to supplement their education by taking classes that their schools may not offer.

3. **Real-Time Feedback:** When compared to more traditional techniques, instructional technology gives superior possibilities for obtaining or presenting feedback. Teachers can assess where their students are in a lesson using a variety of digital technologies. Teachers, for example, could conduct an online poll of students' current comprehension of a topic to receive input into where to focus the next session. Alternatively, teachers may choose to use digital education tools in order to provide quick feedback to students on classes and homework, which may assist students stay on track with learning objectives. Some schools have even experimented with virtual reality classrooms, in which teachers can practice classes or work through professional issues in a simulated setting, allowing them to develop their skills without negatively harming real students.

1.11.3. Difference Between Educational Technology (ET) and Instructional Technology

The terms ET and instructional appear to be synonymous, there are significant differences between them. ET encompasses all aspects of technology used in education. Instructional technology is a broad field that encompasses all aspects of teaching and learning. Instructional technology is described as the science and practice of designing and evaluating learning processes. The primary purpose of instructional technology is to improve the teaching and learning process. The primary purpose of ET is to achieve technical literacy for all. The distinction between ET and instruction technology can be found at the very heart of their definitions. Instruction is a component of education as a whole, however unlike education, instruction is meticulously planned out in every aspect.

Chapter 2

Concept of Communication and Instruction

CONTENTS

2.1. Introduction 34
2.2. Concepts of Communication 34
2.3. Definition 36
2.4. Nature of Communication 37
2.5. Purpose of Communication 40
2.6. Importance of Communication 42
2.7. Principles of Communication 43
2.8. Process of Communication 44
2.9. Communication Models 47
2.10. Educational Communication 54
2.11. Business Communication Channels 57
2.12. Barriers of Communication 60
2.13. Overcoming Communication Barriers 65
2.14. Classroom Communication 67

2.1. INTRODUCTION

You learned about educational technology (ET) and its importance, as well as its components, in the previous chapter. You discovered that ET can assist teachers and students in communicating despite distance and other constraints. However, if this conversation or engagement is inappropriate, the entire endeavor may be ruined. Thus, communication is very important in our lives as well as in the process of teaching and learning. This present chapter will deal with the concept of communication.

2.2. CONCEPTS OF COMMUNICATION

Communication entails the exchange of both verbal and nonverbal messages. It consists of a sender, a receiver, and a communication channel. During the transmission of messages, the clarity of the message may be interfered with or affected by what are commonly referred to as obstacles (Figure 2.1).

Figure 2.1. Communication necessitates a thorough awareness of the sender's and receiver's behavior, as well as any potential hurdles.

Source: https://image.slidesharecdn.com/communication-140722093223-phpapp01/95/communication-1-638.jpg?cb=1406021578.

There are additional difficulties in determining the source of what is to be transmitted, which is a requirement for program effectiveness. Communication (i.e., messages) are frequently initiated by experts or the government without involving the target beneficiaries. As a result, communication activities aimed at imparting knowledge, skills, and/or behavior change frequently fail to achieve the end goal of behavior change since the recipients perceive the activities irrelevant.

Communication processes are divided into two types:

- Mass media; and
- Group media.

Mass media aims to reach a broad audience, whereas group media concentrates on a specific group with well-defined features. Mass media channels include radio, television, and the Internet, whereas group media includes drama, storytelling, music, and dance.

Choosing a communication channel necessitates a thorough awareness of the strengths, limits, and potential solutions associated with each potential channel. Those tasked with establishing health education interventions that need communication must be conscious of their limits in order to create complementary activities that will achieve the intended results. The setting in which communication occurs is a crucial factor in getting the desired effects. First, a scenario study should be performed, which should include an audience analysis, and this might be a quick or full assessment. The results of a situational analysis are then used to make judgments about which messages and channels to use. Where appropriate, the situational analysis identifies options for adopting multiple messages.

In other words, the intended beneficiaries should be involved in setting objectives, selecting activities, measuring the effectiveness of the activities, and planning and implementing them. Beneficiaries should also contribute to the creation of an atmosphere favorable to the delivery of effective communication activities. In order to achieve this goal in program terms, national policies and regulations promoting communication are required. In many countries, mass media outlets such as television, radio, the internet, and newspapers are either State monopolies or owned by private firms, making it difficult for public service organizations to gain access to them. Most public health service organizations, particularly those working at the grassroots level, find the hefty fees required for using these information outlets prohibitively expensive. To ensure that communication is used effectively, the situational analysis findings should inform the next stages, as previously described. In this regard, it is critical to determine whether the problem or concern is not caused by a lack of policy or regulation, and is not always caused by a lack of communication. Communication has been viewed as a failure in some cases when, in fact, the problem required policy or legislative solutions rather than communication. The identification of elements that predispose, enable, and reinforce knowledge acquisition and behavior change should lead communication procedures.

Communication strategies that encourage interpersonal interaction are more likely to result in intended behavior modification. Drama, song, storytelling, and discussion are examples of interpersonal group communications. Unlike mass media, interpersonal communication can take into account social, cultural, and behavioral elements that influence health outcomes.

Communication is used to deliver complex, sensitive, and contentious information. It is vital that persons in charge of disseminating information have training in dealing with delicate or contentious subjects in order to maximize the benefits of communication.

Finally, the credibility of the information source is substantially connected with the achievement of intended behavioral results. All content to be communicated should be rigorously vetted to avoid misrepresentation or transmitting conflict messages, because once anything is communicated, it cannot be recalled 'uncommunicated.' In other words, retraction of a statement or apology does not imply that communication did not occur or that what was said has been deleted. Despite the correction, it remains a record. Allowing any sort of put-down or unconstructive criticism before, during, or after communication ensures communication freedom.

Last but not least, listening is an important aspect of communication. Unfortunately, it is rarely taught academically, and it is also not recognized during the development of communication interventions. It is essential that one does not appear impatient or in a rush in order to listen effectively. Both parties should enable each other to converse freely and without interruption.

2.3. DEFINITION

Attempts have been made by different authors to define communication. A few are enumerated below:

- "Communication is the process of passing information and understanding from one person to another."—**Keith Davis**
- "Communication is the process of transmitting information from one person to another."—**Ricky W. Griffin**
- "Communication is the intercourse by words, letters or messages, intercourse of thoughts or opinions. It is the act of making one's ideas and opinions known to other."—**Fred G. Meyer**
- "Communication means to share in, to give to another or the interchange of-thoughts, opinions, or information."—**Webster**
- "Communication is an exchange of facts, ideas, opinions, or emotions by two or more persons."—**W. H. Newman and C. F. Summer Jr.**
- "Communication in its simplest form is conveying of information from one person to another."—**Hudson**
- "Communication is the process of passing information and understanding from one person to another."—**Keith Davis**
- "Communication is a continuing and thinking process dealing with the transmission and interchange with understanding of ideas, facts, and courses of action."—**George R. Terry**
- "Communication is the transmission of information, ideas, emotions, skills, etc., by the use of symbols, words, pictures, figures, graphs, etc. It is the act or process of transformation that is usually called communication."—**Berelso and Steiner**
- "Communication maintains and animates life. It creates a common pool of ideas, strengthens the feeling of togetherness through exchange of messages and translates thought into action."—**UNESCO-Many Voices One World**

2.4. NATURE OF COMMUNICATION

The process of conveying information from one person to another is known as communication. The goal of communication is to comprehend information. Whatever one intends to convey to someone must be clearly understood by him, else the goal of communication is negated.

Communication in an organization enables the flow of information and understanding across different people and departments by utilizing all channels and networks. This flow of information is critical for management efficacy and decision making in general, and for human resource managers in particular, because he must communicate with department managers, employees, and workers, and trade union leaders (Figure 2.2).

Figure 2.2. Communication aids in better understanding individuals by eradicating misunderstandings and promoting clarity of ideas and speech.

Source: https://www.vskills.in/certification/blog/wp-content/uploads/2020/04/Communications-1.jpg.

Communication also teaches people. Communication can be written or spoken, formal or casual, and upward, downward, horizontal, diagonal, interpersonal, intrapersonal, interdepartmental, or intra-organizational.

Communication pulls individuals together and brings them closer together. Communication is a critical management function that is inextricably linked to all other managerial tasks. It bridges the gap between individuals and groups by facilitating the exchange of information and understanding. The most important part of communication is information. It is the data that is communicated, studied, analyzed, interpreted, and saved. As a result, the manager must set aside time to collect, evaluate, and store information for decision-making and day-to-day operations.

Communication, on the other hand, has distinct features or nature. These are the characters:

1. **Interchange of Information:** The basic characteristic of human communication is that it aims at exchanging information. It is a two-way street. The transaction can take place between two or more people. It could be on an individual or corporate level.
2. **Ongoing Process:** Communication is an ongoing process. It is not fixed. It is dynamic and prone to ongoing modification. The persons with whom communication is held, the substance and type of communication, and the circumstances in which communication is held are all always changing.

3. **Mutual Understanding:** The primary goal of communication is to achieve mutual understanding. The communication should be received and understood in the way that the sender intended.
4. **Reaction or Response:** Communication always elicits a response or reaction. Only when the receiving person understands and acknowledges the message, as well as reacts and responds to it, does it become communication.
5. Communication is a universal function that applies to all levels of authority.
6. **Social Activity:** Communication is also a form of social activity. The components of a society are in a sharing relationship, whether it is knowledge, feelings, or emotions.

   The same can be said for educational communication. It necessitates the efforts of both the student and the teacher to communicate with one another and make themselves understood. A social action is essentially the process by which individuals strive to share meaning and relate to one another.
7. It requires at least two people: a sender and a receiver. The sender is known as a "communicator," and the receiver is known as a "communicate." The "sender/communicator" is the person who speaks, writes, or provides orders, and the "receiver/communicator" is the person who receives the communication.
8. In communication messages is the must. A message is the subject of communication, for example, the contents of a letter or speech, an order, instructions, or ideas. A message must be conveyed by a communication.
9. Communication is written, oral or gestural. It is commonly thought to be spoken or written words. However, communication entails more than just speaking and writing.

   Everything that can be utilized to transfer meaning from one person to another is included. For example, a movement of the lips, a blink of an eye, or a gesture of the hands.
10. Communication is a two-way process. It entails both knowledge and comprehension. Communication is not complete unless the recipient has correctly understood the message and the sender is aware of his reaction or response.

11. Its primary goal is to elicit a response. Communication's fundamental goal is to elicit a reaction or affect human behavior.
12. Formal or informal communication. Formal communication adheres to the formal channels established by the organization's structure. Informal communication routes that are not offered by the organization's structure. These channels form among members as a result of personal contacts made while working together.
13. Communication moves up and down as well as side to side. Communication is directed downward from a superior to subordinates and upward from a subordinate to a superior.
14. Communication is an integral part of the process of exchange. It is the sharing of ideas, feelings, emotions, knowledge, and information between two or more people.

2.5. PURPOSE OF COMMUNICATION

Management is the process of getting things done through others. People working in the organization should therefore be informed on how to accomplish the work entrusted to them as efficiently as feasible. Communication is critical in any institution or organization (Figure 2.3).

Figure 2.3. Purpose of communication.

The purpose of communication can be summed up as follows:

1. **Information Flow:** Relevant information must be continuously flowed from top to bottom and vice versa. Staff at all levels must be kept informed of the organization's aims and other happenings. It must be ensured that no one is misled. The information should be delivered to the incumbent in a language that he or she understands. It is best to avoid using complex words. The right information should be delivered to the right person at the right time, via the right person.
2. **Coordination:** The actions of all employees in the organization can be coordinated through communication in order to achieve the organization's goals. The essence of management is the coordination of all workers and their activities, which can be accomplished through good communication.
3. **Learning Management Skills:** Communication promotes the flow of information, ideas, beliefs, perception, advice, opinion, orders, and instructions, and so on, in both directions, allowing managers and other supervisory employees to learn managerial skills through the experience of others. The sender's experience is mirrored in the communication, which the person receiving it can learn by evaluating and comprehending it.
4. **Preparing People to Accept Change:** Proper and effective communication is a vital instrument in the hands of any organization's management to bring about overall change in the organization's policies, procedures, and work style, as well as to make the employees accept and respond favorably.
5. **Fostering Good Human Relations:** Through communication, managers, workers, and other personnel communicate ideas, thoughts, and impressions. This allows them to better comprehend one another. They are aware of the problems that their coworkers are experiencing at work. This promotes good interpersonal relations inside the organization.
6. **Encouragement of Subordinates' Ideas:** On specific occasions, communication helps inviting and encouraging ideas from subordinates on any task. This will help to foster innovative thinking. Honoring subordinates' ideas will drive them to work

harder and establish a sense of belonging to the organization. It will encourage people to share information with their superiors without reservation. Managers must be aware of their subordinates' ideas, thoughts, remarks, emotions, and attitudes, and subordinates must be aware of the same from the lowest level personnel in their respective departments.

2.6. IMPORTANCE OF COMMUNICATION

In today's world, the advancement of telecommunications and information technology, as well as greater competitiveness and complexity in manufacturing, have raised the importance of communication in organizations of all sizes and types. A corporate leader must be able to successfully interact with his superiors, colleagues in other departments, and subordinates. This will motivate him to do well and allow him to offer his all to the organization.

The following examples demonstrate the significance of communication in human resource management:

1. **Foundation for Action:** Communication serves as the foundation for all actions. Any activity begins with communication, which brings the required information to the table.
2. **Planning Becomes Easier:** Communication makes planning easier. Communication facilitates planning. Communication allows for the collection of any type of information pertaining to the human resource requirements of each department of the organization, including qualifications, job types, and so on, which aids in human resource planning. Policies and programs for acquiring them can be developed and implemented. Communication is essential throughout the process, and it also aids in organizational management planning.
3. **Means of Coordination:** Communication is an important tool for coordinating the efforts of different people at work in the organization.
4. **Assists in Decision-Making:** Information gathered through communication assists in decision-making. Communication makes it easier to obtain the critical information needed to make decisions.

5. **Provides Effective Leadership:** Effective leadership requires a manager to be close to his subordinates in order to exchange ideas, submit appropriate suggestions, understand their viewpoints, seek advice, and make judgments. This allows a manager to gain the trust of his subordinates by regularly speaking with them and removing potential misunderstandings. In this way, he motivates his team to achieve the organization's goal.
6. **Improves Morale and Motivation:** An efficient communication system instils confidence in subordinates and employees, resulting in a shift in their attitude and behavior. Misunderstanding is the primary source of conflict and discontent, which may be eliminated by effective communication skills. The eradication of misunderstanding allows the management and his subordinates to understand one other and establish strong working relationships. This raises people's morale and inspires them to work harder.

2.7. PRINCIPLES OF COMMUNICATION

An organization suffers from a lack of good communication. So, in order to communicate effectively, some principles must be observed.

They are as follows:

1. **Clarity:** The principle of clarity states that the communicator should use language that is simple to understand. The receiver must comprehend the message. The terms chosen should be straightforward and unambiguous. There should be no ambiguity or misinterpretation in the terminology. Because language is the channel of communication, it must be plain and intelligible.
2. **Adequacy and Consistency:** The communicator must ensure that the information to be transmitted is complete and adequate in every way. Inadequate and incomplete messaging causes confusion and delays action. Adequate information must be in line with the organization's goals, strategies, rules, and processes. Inconsistent messages can cause havoc and skew corporate goals.
3. **Integration:** The integration principle depicts how, through communication, the efforts of the organizations human resources should be combined toward the attainment of corporate objectives. The goal of communication is to obtain the desired result. The goal of communication should be to coordinate the activities of the employees at work in order to achieve the corporate goals.

4. **Cost-Effectiveness:** Unnecessary use of communication systems will increase costs. The communication system must be used efficiently and timely, that is, at the proper moment and when it is required. This is one approach to save money when using a communication system.
5. **Feedback:** If the receiver does not provide feedback, the objective of communication is defeated. The purpose of communication is fulfilled when the receiver confirms receipt of the message in its proper perspective. Only in the case of written correspondence and communications sent via messengers is feedback required. In the event of spoken communication, the feedback is immediately available.
6. **The Need for a Communication Network:** A communication network is the path that a communication takes from its sender or communicator to its receiver or communicative. This network is critical for effective communication. The success of management will also be determined by the availability of a sufficient network.
7. **Attention:** The message sent must pique the receiver's interest and compel him to take appropriate action. The efficient, truthful, and timely manager is successful in drawing his subordinates' attention to what he is saying.

People's psychology dictates that they closely observe their superiors and then comply with their orders or directions. Lazy and disingenuous supervisors fail to gain support for themselves, and their subordinates frequently do not take their directions seriously. Adhering to the aforementioned principles will improve communication, reduce human relations issues, and promote overall efficiency.

2.8. PROCESS OF COMMUNICATION

Communication is a dynamic process that begins with the sender thinking ideas and then transmitting the message over a channel to the receiver, who subsequently provides response in the form of some message or signal within the time range specified. As a result, there are seven primary components of the communication process (Figure 2.4):

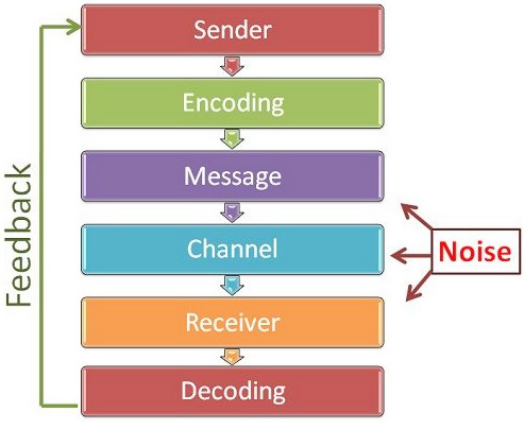

Figure 2.4. Communication process.

Source: https://businessjargons.com/wp-content/uploads/2016/03/communication-process.jpg.

1. **Sender:** The sender, also known as the communicator, is the person who initiates the conversation and has conceptualized the idea that he wishes to convey to others.
2. **Encoding:** The sender begins the encoding process by translating the information into a message using specific words or nonverbal methods such as symbols, signs, body movements, and so on. The sender's knowledge, abilities, perception, background, competencies, and so on all have a significant impact on the message's success.
3. **Message:** When the encoding is complete, the sender receives the message that he intended to convey. The message can be written, oral, symbolic, or nonverbal, such as body gestures, silence, sights, sounds, and so on, or any other indication that causes a receiver to respond.
4. **Communication Channel:** The Sender selects the medium through which he wants to convey his message to the recipient. It must be properly chosen in order for the message to be effective and appropriately interpreted by the recipient. The medium used is determined by the sender's and receiver's interpersonal relationships, as well as the urgency of the message being sent.

Some of the most common communication mediums are oral, virtual, written, sound, gesture, and so on.

5. **Receiver:** The person for whom the message is intended or targeted is referred to as the receiver. He attempts to comprehend everything as thoroughly as possible so that the communication goal is met. The receiver's ability to decipher the message is determined by his understanding of the subject matter, experience, trust, and relationship with the sender.
6. **Decoding:** The receiver understands the sender's message and attempts to understand it as best as possible. An effective communication occurs only when the receiver interprets the message exactly as the sender intended.
7. **Feedback:** It is the final stage in the process that confirms the recipient received the message and correctly interpreted it as intended by the sender. It improves communication effectiveness by allowing the sender to gauge the effectiveness of his message. The receiver's response can be verbal or nonverbal.

2.8.1. Types of Noise During the Communication Process

Reducing 'noise' or distractions can improve your chances of effectively delivering your idea. It ensures that your message is not misunderstood or dismissed, and that the receiver takes this seriously instead. Senders should consider the receiver's personal beliefs as well as their physical environment in order to successfully minimize noise. Here are the four types of noise you should avoid for clear communication:

1. **Psychological Noise:** Because of human barriers, this form of noise interferes with communication between sender and receiver. It is a sign of respect to manage psychological noise. It fosters trust and encourages people to speak out.

   Here are some examples of psychological noise:

- Preconceived beliefs;
- Biases and prejudice;
- Stereotypes;
- Sarcasm.

2. **Physical Noise:** External distractions in the workplace are referred to as physical noise. Noise from colleagues chatting

loudly or listening to music shows how our circumstances might interfere with our ability to understand or decode a message.

3. **Environmental Noise:** Noise from a construction site or passing traffic, for example, makes it difficult to hear or concentrate on a message. Noise can influence our emotions and, as a result, how we perceive a message. That is why it is critical to limit distractions to a minimum.
4. **Semantic Noise:** On the sender's end, semantic noise is interference. This could be due to technological faults or a lack of communication skills. When writing, it is critical to avoid jargon, abstract notions, and unclear language in order to deliver a message simply. Similarly, speaking clearly and confidently can help you explain your message more successfully. It is best to examine the file size of your attachment and the audio quality of your video before delivering it to the receiver when selecting a technological channel of communication.

2.9. COMMUNICATION MODELS

Communication is a complex process, and it can be difficult to pinpoint where or with whom a communication interaction begins and concludes. Communication models make the process easier by visualizing the numerous parts of a communication encounter. Some models are more detailed than others in explaining communication, yet even the most complicated model cannot duplicate what humans feel in even a single communication encounter. Models continue to be useful for communication students because they help us to see specific concepts and phases in the communication process, define communication, and apply communication concepts. When you understand how communication works, you may think more carefully about your communication experiences, allowing you to better prepare for future communication and learn from previous communication. The transmission, interaction, and transaction models of communication will be discussed.

Although these communication models differ, they have similar characteristics. Participants, messages, encoding, decoding, and channels are all components of the first two models we will look at: the transmission model and the interaction model. Participants in communication models are the senders and/or receivers of messages in a communication encounter. The message is the material that is communicated verbally or nonverbally from sender to receiver. For instance, when you say "Hello!" to your buddy,

you are sending a welcoming message that your friend will receive. The encoding and decoding process is the internal cognitive process that permits individuals to transmit, receive, and understand messages. Encoding is the process of converting ideas into communication. The level of conscious thought that goes into encoding signals varies. The process of converting communication into thoughts is known as decoding.

2.9.1. Transmission Model of Communication

The transmission model of communication describes communication as a linear, one-way process in which a sender knowingly transmits a message to a receiver (Ellis and McClintock, 1990). Within a communication interaction, this model focuses on the sender and message. Although the receiver is included in the model, it is viewed as a target or end point rather than a part of a continuous process. We must assume that the receiver either receives and understands the message or does not. The scholars who developed this model extended on a linear model proposed by Aristotle centuries before which included a speaker, message, and hearer.

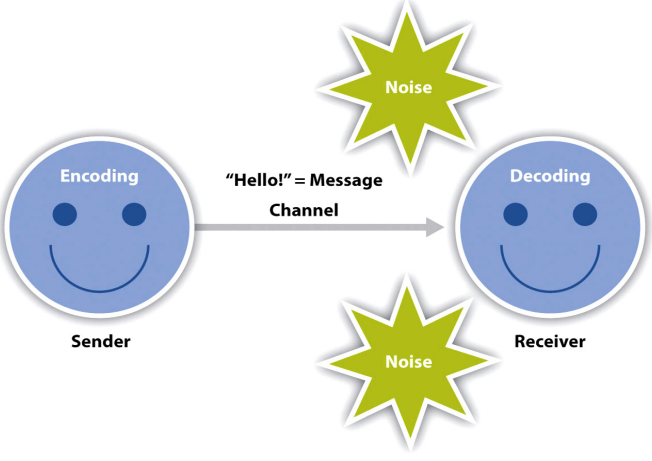

Figure 2.5. The transmission model of communication.

Source: https://open.lib.umn.edu/app/uploads/sites/192/2016/09/7ca391217888c4249c92e580b1552e5f.jpg.

They were also affected by the introduction and proliferation of new communication technologies such as telegraphy and radio at the time, and you can certainly see these technical influences within the model (Shannon

and Weaver, 1949). Consider how a radio message is delivered from a person in a radio studio to you in your car. The radio announcer encodes a vocal message that is delivered by a radio tower via electromagnetic waves (the channel) and eventually reaches your (the receiver's) ears via an antenna and speakers to be decoded. The radio announcer has no way of knowing whether or not you got his or her message, but if the equipment is operational and the channel is clear of static, there is a good possibility that the message was successfully received (Figure 2.5).

Because this model is sender and message centered, it is the sender's obligation to help guarantee the message is successfully transmitted. This model emphasizes clarity and effectiveness, but it also recognizes that successful communication is hampered by obstacles. Noise is defined as anything that interferes with the transmission of a message between participants in a communication encounter. Even if a speaker provides a clear message, noise might interfere with the message being received and decoded correctly. Environmental and semantic noise are accounted for in the communication transmission model. Any physical noise present in a communication interaction is referred to as environmental noise. Other people's conversations in a packed diner may interfere with your ability to transmit and correctly decode a message. While environmental noise interferes with message transmission, semantic noise happens during the encoding and decoding process when individuals do not grasp a sign. For example, FM antennae cannot decode AM radio broadcasts and vice versa. Similarly, most French speakers are unable to decode Swedish, and vice versa. Because many words have many or unknown interpretations, semantic noise can also impede with communication among people speaking the same language.

Although the transmission model may appear simple or even underdeveloped to us now, its development enabled scholars to investigate the communication process in novel ways, leading to more complicated models and theories of communication that we shall cover in greater depth later. This model is not nearly detailed enough to reflect dynamic face-to-face exchanges, but there are times when communication is one-way and linear, particularly with computer-mediated communication (CMC).

2.9.2. Interaction Model of Communication

The interaction model of communication defines communication as a process in which people switch roles as sender and receiver to build meaning

by sending messages and getting feedback in physical and psychological situations (Schramm, 1997). Instead of depicting communication as a one-way, linear process, the interaction model integrates feedback, making communication a more interactive, two-way process. Messages given in response to other messages are considered feedback. For example, your instructor may respond to a point you make during class discussion, or you may point to the sofa when your roommate inquiries about the location of the remote control. The addition of a feedback loop results in a more comprehensive understanding of the responsibilities of participants in a communication interaction. Instead of a single sender, a single message, and a single receiver, this model has two sender-receivers who exchange messages. To keep a communication encounter going, each participant switches roles as sender and receiver. Although it appears to be a conscious and purposeful activity, we switch between the roles of transmitter and receiver relatively fast and frequently without conscious thinking.

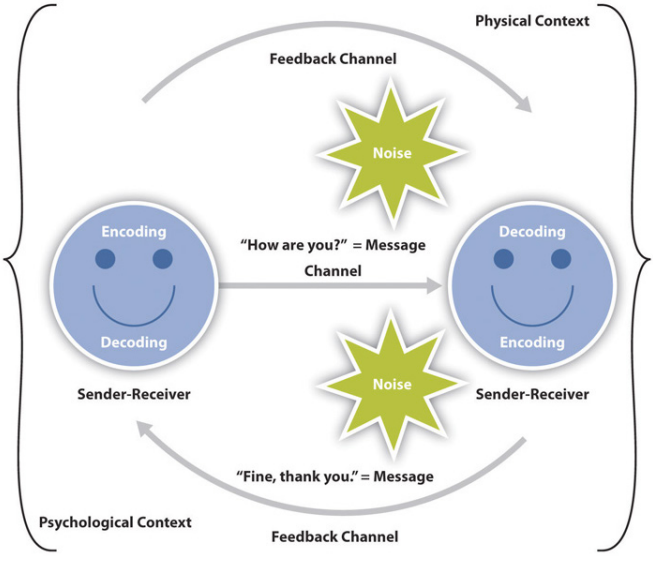

Figure 2.6. The interaction model of communication.

Source: https://open.lib.umn.edu/app/uploads/sites/192/2016/09/d36f6f82eecf-21ec7a2716ca4a27670a.jpg.

The interaction model is also less focused on the message and more focused on the interaction. The transmission model was concerned with how a message was transmitted and whether or not it was received, whereas the

interaction model was concerned with the communication process itself. In fact, this model recognizes that so many signals are being sent at once that many of them may not even be received. Some messages are also conveyed inadvertently. As a result, communication in this paradigm is not considered effective or ineffective solely on whether or not a particular message was successfully conveyed and received. The interaction model takes physical and psychological context into account. Physical context includes the environmental factors in a communication encounter (Figure 2.6).

2.9.3. Transaction Model of Communication

Models expanded to account for more of the communication process as communication research evolved. Many academics regard communication as more than just a means of carrying on talks and conveying meaning. We do not send messages like computers, and we do not smoothly switch between the roles of sender and receiver as an interaction progresses. We cannot also actively decide to cease communicating because communication entails more than just sending and receiving messages. The transaction model differs significantly from the transmission and interaction models in several aspects, including how communication is conceptualized, the roles of sender and receiver, and the significance of context (Barnlund, 1970).

To summarize, each model combines a unique idea of what communication is and what it does. Communication is viewed as an entity, similar to an information packet, which is conveyed from one location to another in the transmission model. According to this point of view, communication is defined as the sending and receiving of messages. Communication is viewed as an interaction in which a message is sent, followed by a reaction (feedback), which is then followed by another reaction, and so on. Communication, according to this point of view, is described as the production of dialogues and interactions within physical and psychological environments. Communication, according to the transaction model, is integrated into our social realities in such a way that it enables us not only understand but also create and modify them.

Communication, according to the transaction model, is a process in which communicators produce social realities within social, relational, and cultural settings. In this approach, we communicate not simply to exchange messages, but also to form relationships, make multicultural alliances, define our self-concepts, and engage in discussion with others to build communities. In short, we do not communicate about our realities; rather, communication aids in the construction of our realities.

In the transaction model of communication, the roles of sender and receiver change dramatically from those in the other models. Participants in a communication encounter are referred to as communicators rather than senders and receivers. Unlike the interaction model, which argues that individuals alternate between being sender and receiver, the transaction model suggests that we are both senders and receivers at the same time. On a first date, for example, as you convey verbal cues about your hobbies and history, your date responds nonverbally. You do not wait until you have finished conveying your vocal message to begin receiving and understanding your date's nonverbal messages. Instead, you are transmitting your verbal message while also receiving your date's nonverbal messages. This is a significant component to the model because it allows us to comprehend how we might alter our communication—for example, a spoken message—while it is being sent based on the communication, we are receiving from our communication partner at the same time (Figure 2.7).

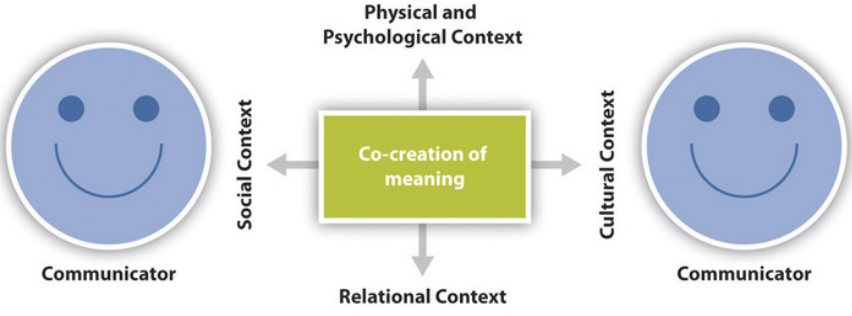

Figure 2.7. The transaction model of communication.

Source: https://open.lib.umn.edu/app/uploads/sites/192/2016/09/ee0e813e88f-c1b3686c61e78f804c799.jpg.

The transaction model also provides a more complex understanding of context. The interaction model depicts context as physical and psychological influences that help or hinder communication. While these aspects are important, they are primarily concerned with message transmission and reception. Because the transaction model of communication considers communication to be a force that shapes our realities both before and after specific interactions, it must account for contextual influences that occur outside of a single interaction. The transaction model considers how social, relational, and cultural contexts frame and influence our communication

encounters to accomplish this. The term "social context" refers to the stated or unstated norms that govern communication. We learn rules and implicitly pick up on norms for communicating as we are socialized into our various communities. Do not lie to people, do not interrupt people, do not pass people in line, greet people when they greet you, thank people when they pay you a compliment, and so on are some common rules that influence social contexts. These guidelines are frequently directly communicated to youngsters or students by their parents or teachers. Rules may be stated repeatedly, and there may be consequences for not following them.

Norms are social norms that we learn through observation, practice, and trial and error. We may not even realize we are violating a social standard until we notice people staring at us oddly or someone corrects or teases us. For example, as a new employee, you may over- or under-dress for the company's holiday party because you are unfamiliar with the formality standard. Although there is probably no written rule about how to dress at the holiday party, you will recognize your blunder without anybody having to point it out, and you will most likely not break from the usual again to save yourself from shame. Even if breaching social norms does not result in the formal punishment that breaking a social rule would, the social embarrassment we feel when we violate social norms is typically enough to teach us that these norms are powerful even if they are not made explicit like rules. In some cases, norms have the authority to override social regulations. To return to the examples of typical social standards stated previously, we may violate the rule against lying if the falsehood is intended to stop someone from feeling upset. We frequently interrupt close friends who are having an intriguing conversation, but we are less inclined to interrupt a professor who is lecturing. Because norms and rules differ between persons and cultures, relational, and cultural contexts are also incorporated in the transaction model to assist us comprehend the various settings that influence our interactions.

The past interpersonal history and type of relationship we have with a person are included in the relational context. When we meet someone for the first time, we communicate differently than when we have known them for a long time. Initial encounters with individuals are more scripted and governed by established norms and regulations, but once we build a relationship with someone, we may be able to bend or break social conventions and standards more easily. For example, you might follow societal conventions of courtesy and attentiveness and spend the entire day cleaning the house the first time you welcome your new neighbors over. When the neighbors come to your

house, you might make them the center of your attention for the duration of their visit. If you wind up becoming friends with your neighbors and building a relational context, you might not think about having things cleaned and prepared or even giving them your undivided attention during subsequent visits. Relationship type is included in relational context since communication norms and rules differ depending on the type of relationship people have. Certain communication rules and conventions, for example, apply to a supervisor-supervise relationship but not to a brother-sister connection, and vice versa. Culture influences how we communicate in the same way that social norms and relationship history do.

Race, gender, nationality, ethnicity, sexual orientation, class, and ability are all characteristics of identity that are influenced by cultural context. Some people, particularly those with historically marginalized identities, are acutely aware of how their cultural identities influence their communication and how others communicate with them. People with dominant or majority identities, on the other hand, may rarely, if ever, consider the impact their cultural identities have in their communication.

Cultural environment is influenced by many facets of our identities, including race and ethnicity. It can be tough to handle when cultural context comes to the foreground of a communication engagement. Because intercultural communication produces ambiguity, it might dissuade people from speaking across cultures or contribute to a bad perception of intercultural communication. However, if you avoid communicating across cultural identities, you are unlikely to improve your communication skills.

2.10. EDUCATIONAL COMMUNICATION

Education has traditionally been regarded as a means of communication between individuals and the society in which they live. The information, values, skills, and norms of society are passed from generation to generation through this process. Let us now look at how educational communication occurs. The input in educational communication is knowledge, skills, standards, and values of a society delivered in a specific subject matter, which is supplied and handled by the instructor. Coding occurs when she presents facts, thoughts, attitudes, statements, and so on, as messages are encoded into sound, visual images, printed words, and nonverbal communications. As a result, coding is the act of making the needed input visible and audible to the learners. The sound signals or visual signals created by the teacher, chalk, and board, or even audio-visual signals that precisely and clearly

convey the lesson to the learners are the channels of communication. Noise is defined as anything that disrupts or interrupts communication. The primary source of noise in the classroom, for example, is the teaching environment, which includes the chairs, chalk, and board, as well as the color of the wall and the teacher's voice quality. A larger teacher-learner ratio, as well as a teacher who is unsure of her/his purpose, causes an impediment to learning. The message is decoded by the learners, and the output is dependent on the learners' prior knowledge of the subject being taught, note-taking skills, capacity to read books and extract information, and so on. The learner is at the heart of educational communication. Feedback from the learner to the teacher is critical for managing communication channels and allowing the teacher to eliminate impediments or interruptions and change information to meet the needs of the learner.

2.10.1. Skills That Are Necessary for Effective Communication

Effective communication is critical both on and off the job because it enables you to convert your goals and emotions into easily comprehended communications. Effective communication increases your productivity and mitigates the unwanted repercussions of miscommunication. By developing an efficient communication strategy, you can have a deeper understanding of what others are saying and become a more effective collaborator and team member.

Developing more effective communication habits requires the acquisition of several critical abilities that must be employed in unison. Some of these abilities are tied to how you speak or how you carry your body, while others are more emotional in nature. Several traits of effective communicators include the following:

1. **Listening Skills:** Effective communication starts with active listening. If you are simply concerned with your own expression, you are unlikely to listen to or respond to what others have to say. A skilled communicator makes use of a range of listening skills. They listen intently to what is said and ensure that others feel heard and considered.
2. **Empathy:** It is critical to understand the feelings of those around you in order to communicate effectively. Empathizing includes both comprehending and relating to another person's feelings. Possessing a high level of emotional intelligence and the capacity

to empathize enables you to develop relationships with others and enhances your communication abilities.

3. **Nonverbal Communication Skills:** In addition to verbal messages, effective communication relies on nonverbal indicators. To improve your messaging and presentation talents, you must develop a greater awareness of your body language and tone of voice.
4. **Teamwork:** Actively participating in team building and collaborating with coworkers is critical for enhancing your business communication talents. The deeper your relationships and connection with coworkers, the more effectively you can communicate with them.

2.10.2. How to Improve Your Communication Skills?

If you believe you lack the core communication skills necessary for effective communication, there are several proven ways for improvement. Here are some suggestions to assist you in developing your communication skills:

1. **It is Necessary to Practice Active Listening:** Effective communicators are always good listeners. Active listening requires responding affirmatively to what people say and following up with further questions to demonstrate that you are paying attention.
2. **Pay Close Attention to Nonverbal Signals:** Understanding nonverbal cues and signals can assist you in avoiding misinterpretation and indicating your interest to others. When in a professional setting, pay close attention to your facial expressions and body language. Your nonverbal clues have an effect on the first impression you make on someone. Maintaining eye contact, minimizing hand motions, and maintaining proper posture go a long way when meeting someone for the first time.
3. **Exercise Self-Control Over Your Emotions:** Regulating your emotions and communicating them effectively in context is crucial for effective communication and personal well-being. Allowing strong emotions to infiltrate a work environment in an unsuitable manner can result in ineffective communication and conflict.
4. **Request Feedback:** There is no shame in asking genuine feedback from coworkers regarding your communication

ability. By soliciting input from coworkers or subordinates on how to improve your communication skills, you can gain a better understanding of how you come across in the workplace. Develop an appetite for various points of view and a willingness to strengthen relationships with coworkers.

5. **Hone Your Public Speaking Abilities:** While public speaking might be scary, there is no better way to develop excellent communication skills than to actively seek out opportunities to speak. Excellent communicators can convey their emotions succinctly, regardless of whether they are speaking to a large group or one-on-one with another individual. Regularly speaking in front of a group will show your strengths and weaknesses and will force you to develop exceptional communication skills.
6. **Construct a Filter:** Effective communicators often possess strong social skills and are capable of adapting their way of expressing their thoughts and feelings to those around them. Recognize when it is appropriate to express oneself in diverse interpersonal situations. Creating a filter will assist you in supplementing other communication methods, maintaining a certain level of civility, and avoiding workplace confrontation.

2.11. BUSINESS COMMUNICATION CHANNELS

Communication in business is held to a higher standard than communication in everyday life. The consequences of misunderstandings are typically more serious than those associated with informal communication. The approaches for better communication are universal regardless of the location of the conversation.

There is a well-known expression that goes “It’s not what you say, it’s how you say it.” It is really both. A communication channel is the medium, mean, mode, or manner in which a message is transmitted to its intended recipient. Written (hard copy print or digital formats), oral or spoken communication, and electronic and multimedia communication are the primary channels. Business communications can be formal, informal, or unofficial within certain channels. Finally, communications might be either extensive or sparse.

The term “channel richness” refers to the quantity and speed with which information may be transmitted. Face-to-face communication is extremely rich in terms of content since it enables the transmission of information with

rapid reaction. For example, a tweet is deficient in richness due to Twitter's limit of 280 characters without feedback. Face-to-face communication, on the other hand, is confined to one individual speaking with a few other persons in close proximity. By comparison, a tweet can reach thousands of people worldwide. Figure 2.8 illustrates the range of available modes of communication.

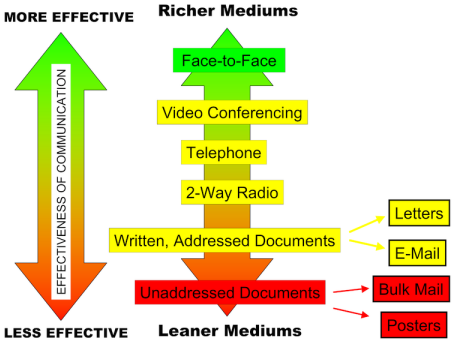

Figure 2.8. Diverse modes of communication have varied levels of channel richness.

2.11.1. Oral Communications

Oral channels are reliant on spoken language. They are the most diverse mediums, and they include face-to-face, in-person presentations, mobile phone conferences, group presentations, telephone, and video meetings, as well as conferences, speeches, and lectures. These channels transmit signals with minimal distortion since body language and vocal intonation also convey meaning to the receiver. They enable the sender to receive rapid feedback on the communication. They are also the most labor-intensive channels in terms of transactional personnel. Oral channels are typically utilized in organizations when the message has a high probability of eliciting worry, bewilderment, or an emotional response from the listener. For example, in face-to-face meetings with management staff, a senior manager should address rumors about layoffs or downsizing. This allows the receivers (audience) to get immediate clarity and explanations, even if the explanation is a simple but direct: "At this time, I just don't know."

Oral communications are especially advantageous when an institution wishes to introduce a key official or modify a long-standing policy, followed by a lengthy written explanation. Senior executives with a high degree of

credibility frequently convey complex or upsetting messages. For instance, a top manager may frequently reveal downsizing intentions during a meeting to ensure that everyone receives the same message simultaneously. This frequently includes a calendar or timeframe so that people know when to expect additional information.

2.11.2. Written Communications

Emails, messages, memos, letters, documents, reports, newsletters, and spreadsheets are all examples of written communications. (E-mails, while electronic, are essentially digital versions of handwritten memos.) They are one of the more efficient modes of commercial communication. With written communications, the writer must provide sufficient context to ensure that the words are easily understood. The receiver should inquire about any uncertainty and, if necessary, seek clarification. A sender of an e-mail cannot take reception for granted. The majority of people receive an excessive amount of email and quickly sort and filter it, sometimes erroneously.

When transmitting huge messages, written communications are effective. Humans have a limited capacity for data absorption. If necessary, written information can also be studied over time. When it is necessary to persuade the receiver regarding a course of action, reports can include supporting evidence and thorough explanations. Written communications can be precisely crafted to convey the sender's intent. Written business correspondence, such as employment offer letters, contracts, and budgets, proposals, and quotes, should always be used.

2.11.3. Electronic (Multimedia) Communications

Television broadcasts, computer-based communications such as social media, interactive blogs, public, and intranet company web pages, and social media platforms such as Facebook and Twitter all fall under this expanding category of communication channels. Electronic communications enable the instantaneous and global transmission of messages. Individuals can communicate face to face across great distances. Marketing and advertising can be directed at a variety of distinct client segments, and business units can connect effortlessly in real time. This is especially critical when product recalls or security concerns must be communicated to customers.

While electronic communications are tremendously productive, their extensive use for corporate purposes can also be dangerous. Numerous large organizations' private conversations and customer files have been

hacked and their data taken in recent years. New Jersey Horizon Blue Cross Blue Shield was fined $1.1 million in 2016 for failing to safeguard medical patients' personal information. The corporation kept unencrypted sensitive data on computers stolen from their main headquarters, including birth dates and Social Security numbers (Table 2.1).

Table 2.1. Major Types of Business Communication Channels

Type of Channel	Advantages	Disadvantages
Oral communications	Build relationships and trust; accelerate decision making due to immediate feedback	Spontaneous nature may lead to unwise statements; people are unable to refer to the communication once it is said unless a record is made.
Written communications	Message can be revised for exactness; can be archived for reference; can be studied. Appropriate for legal and formal business functions.	Message is static; sender does not receive immediate feedback. Hard for the sender to gauge if the receiver has understood.
Multimedia	Instant, global, and adaptable to multiple targets.	Technical difficulties and hack attacks threaten the security of organizations and their customers/clients.

2.12. BARRIERS OF COMMUNICATION

Numerous communication barriers exist, each of which tends to distort the messages sent between sender and receiver. It results in miscommunication and conflict among organizational members.

Managers usually consider a breakdown in communication as one of their most serious challenges. However, communication difficulties are frequently an indication of more pervasive disorders. For instance, insufficient preparation may contribute to ambiguity regarding the firm's direction.

Similarly, an ineffective organizational structure may fail to explain organizational relationships clearly. Managers may be unsure about what is expected of them when performance requirements are vague.

Thus, the insightful manager will explore for the underlying causes of communication difficulties rather than merely treating the symptoms. Barriers can exist at the sender's end, during the message's transmission, at the receiver's end, or during the feedback.

Communication becomes ineffective as a result of a variety of barriers, including the following:

1. **Semantic Barriers:** This refers to linguistic and symbol boundaries, as well as their interpretation. Each language is made up of symbols that are used to convey meaning from one person to another. Even Morse code and mathematical symbols are utilized to communicate in a language. The barriers stem from the individual's language capabilities.

The following are the different types of semantic barriers:

i. **Poor Quality of Message:** When composing a message, it must be consistent in all aspects, including clarity, precision, and the use of proper language to convey the intended message. It should be written in plain language that the recipient can easily understand. Otherwise, it becomes non-specific, making it difficult for the receiver to follow.

ii. **Faulty Transmission:** When a superior communicates with a subordinate, the individual receiving the message must be able to translate it to various types of subordinates who are constrained by their level of knowledge and IQ. It does require accurate analysis of received messages in order to assist in disseminating information to subordinates.

iii. **Lack of Clarity:** Each communication contains specific concepts that must be appropriately understood. In other words, the message's implied meaning must be well-perceived by the recipient. If it is not, there is a good chance that the message may be misunderstood, resulting in confusion.

iv. **Technical Language:** It is frequently observed that specialists communicate using technical language. This may be unknown to the average person. When interacting with regular people, it is preferable to use a simple, universal language. Consider the instance of a physician who writes 'TDS' on a prescription for a patient (an abbreviation of three times a day). A person may have difficulty understanding something unless it is expressed in plain language or the abbreviation is explained to him.

2. **Psychological Barriers:** The sender's and receiver's psychological states of mind make a significant difference in interpersonal communication. When an individual is overcome by emotion, his tone trumps the message's script. This obstructs natural communication, resulting in emotional barriers.

Psychological barriers include the following:

i. **Premature Evaluation:** It is the process by which a message is evaluated before it is conveyed to the receiver. Such an examination may determine prematurely that the message will not produce the anticipated outcome, and hence he withholds the message. This is a significant psychological aspect that contributes to the communication barrier.

ii. **Inadequate Attention:** Typically, this occurs at the receiver's end of a conversation as a result of carelessness and failure to listen to what the person on the other end is saying. This occurs during face-to-face discussion or when on the phone.

iii. **Transmission Losses and Poor Retention:** When communication passes through multiple hands and levels within an organization, the message is prone to becoming erroneous or corrupted as it is transmitted by numerous individuals. This occurs in both written and oral communication. In the latter case, the receiver may be unable to keep the message in its whole due to a lack of retention capability, resulting in misunderstanding at a later point.

iv. **Undue Stress on Written Message:** Every executive feels that written messages, instructions, and directives are preferable in an organization, as the likelihood of a message being misinterpreted is nearly negligible. When a superior and subordinate communicate face to face, it facilitates not only comprehension but also effectiveness. It does instill confidence in the subordinate regarding the implementation of commands and directions. Without a question, it is a superior mode of communication over textual communication.

v. **Lack of Trust in the Sender by the Receiver:** When a communicator (sender) updates the original communication repeatedly, the receiver on the other end will typically postpone taking the action specified in the message. This occurs as a result of the sender's frequently rash decisions. As a result of the different modifications and additions, the communication

becomes ineffective. This is an illustration of the sender's lack of confidence.

vi. **Failure to Communicate:** Occasionally, the superior/manager fails to communicate necessary information/orders, etc. This could explain the sender's flippant attitude or his apathy. For example, the sender's excessive confidence that the message has been received to the recipients is likely to cause confusion and shame.

3. **Organizational Barriers:** This is determined by the organization's overall communication policy. Such a policy could be a written document outlining many areas of communication, particularly the upstream, downward, and lateral flow of communication inside the organization, since it is desirable to achieve an effective communication flow.

The following list discusses the barrier in this regard:

i. **Restrictions Imposed by Organizational Rules:** Normally, information is to be communicated to higher-ups via the appropriate channel. This is slowed down as it progresses up the hierarchical ladder. Instructions on how to send communications in general must be provided. Additionally, special instructions for handling critical messages must be communicated to all parties to avoid delays.

ii. **Status/Hierarchical Positions Restrict the Flow of Communication:** In personal interactions, an individual's status and/or position are critical. In formal organizations, superior/subordinate capacity also obstructs free flow of communication. This is particularly true in the case of upward transmission. A person at the bottom of the hierarchy may find it difficult to approach the organization's top executive directly.

iii. **Complex Situation of the Organization:** Large organizations with multiple layers of managerial positions may experience communication breakdowns. This occurs as a result of message censorship when it is sent upward; because people are typically unwilling to alert superiors about negative characteristics.

4. **Personal Barriers:** These are the barriers to communication that arise as a result of personal constraints at various organizational levels, such as:

i. **Superiors' Attitudes:** These are critical in the communication process, whether upward, downward, or in any other way. Thus, the superior's attitude, whether favorable or adverse, has an effect on the flow of communication, i.e., from superior to subordinate and vice versa.

ii. **Insistence on Following Proper Channel:** Superiors instruct their subordinates to communicate through the correct channels. They do not want a subordinate to skip them and approach the next higher authority directly. They are constantly seeking to stay connected to the communication process in order to be informed about events occurring within their jurisdiction.

In an emergency, it may be necessary to bypass the superior; yet, the superior may object. He may avoid it by instructing subordinates to keep him informed of any information / message being provided to higher ups on an as-needed basis.

iii. **Subordinate's Lack of Confidence:** It is a widely held belief that subordinates are incapable of advising superiors because they lack the capacity to do so. This fear causes the superior to lack faith in his or her subordinates. This, however, may not be the case, as many subordinates are more capable than their bosses.

iv. **Superior's Preoccupation:** A superior believes that he does not need to interact with him on every subject, since he is constantly concerned with his own work. Supervisor connection with their subordinate is a critical component of efficiency, which many superiors overlook as a result of a lack of time.

v. **Lack of Awareness:** Inadequate knowledge of the value of communication and its utility in a variety of ways may result in superiors failing to pay it the attention it deserves at times. This might result in communication being restricted or being transmitted in an ineffective manner, which can have a negative impact on the organization. This might result in inefficiency and ineffective management.

vi. **Hesitation to Communicate:** This is one of the reasons why subordinates avoid communicating with their bosses. Subordinates demonstrate a reluctance to communicate some facts to their superiors, as this information may have a negative effect on them. Thus, the hesitation to communicate occurs.

5. **Mechanical Barriers:** These are another group of factors putting barriers in the smooth flow of communication.

They are as follows:

i. **Inadequate Arrangements for Message Transmission:** Appropriate coding and decoding facilities are required. This is typically accomplished through the use of coding machines and trained personnel to operate them. When sensitive information is transmitted under a variety of classifications, such as top secret, secret, or confidential, appropriate care must be taken in its transmission. It should not be divulged to unauthorized individuals. Classified information must be handled with care and security by appropriately qualified personnel.

ii. **Inadequate Office Layout:** A proper information center is an unavoidable necessity for transmitting messages both within and outside the organization. As a result, various modes of information transmission are required, including wireless sets, radio communication systems, electronic machines—FAX, e-mail, and so on. The infrastructure necessary to support these systems is critical for effective communication. Without them, various impediments to information transmission may exist.

iii. **Defective Procedures and Practices:** An information center's docketing procedures for incoming and outgoing messages must be defined and properly maintained. Additionally, if proper arrangements are not made to allocate priority messages such as immediate, most immediate, etc., and their subsequent transmissions, the very purpose of communication will be defeated.

iv. **Use of Wrong Medium:** This is another barrier in mechanical communication. The sender of the message is responsible for selecting the appropriate medium. Consider the dispatch of letters from one organization to another located in a remote location.

2.13. OVERCOMING COMMUNICATION BARRIERS

Nowadays, everyone faces numerous communication barriers. The sender's message is not understood in the same terms and sense by the receiver, resulting in a breakdown of communication. It is critical to address and overcome these communication barriers in order to ensure that communication is smooth and effective. We discussed the major barriers to

communication in the preceding section. Let us discuss how to break down these communication barriers:

1. **Eliminating Perception Differences:** The organization should guarantee that the appropriate persons are hired for the job. The interviewer is responsible for ensuring that the interviewee is proficient in both written and spoken language. A proper induction program should be implemented to ensure that all employees understand the company's policies. Appropriate training for required employees should be conducted (for example, Voice, and Accent training).
2. **Use of Simple Language:** Emphasis should be placed on the use of simple and plain language. Avoid employing ambiguous language and jargon.
3. **Noise Reduction and Elimination:** Noise is the primary communication hurdle that must be overcome first. It is critical to locate and eliminate the source of noise.
4. **Active Listening:** Pay close attention and listen carefully. The terms "listening" and "hearing" are not synonymous. Active listening entails hearing the message being conveyed with sufficient comprehension. By asking questions, the speaker can ascertain whether or not the receiver comprehends his or her message in the same terms as the speaker intended.
5. **Emotional State:** It is critical to use effective body language during communication. He/she should avoid expressing emotions during communication to avoid the receiver misinterpreting the message being delivered. For instance, if the message's sender is in a foul mood, the recipient may conclude that the information being conveyed is bad.
6. **Organizational Structure Should be Simple:** The organizational structure should be simple. The hierarchy's level count should be kept to a minimum. Within the organization, there should be an optimal control span. The more straightforward the organizational structure, the more effective communication will be.
7. **Avoid Information Overload:** Managers must be capable of prioritizing their work. They must avoid becoming overburdened with work. They should invest time in their subordinates and actively listen to their concerns and feedback.

8. **Provide Constructive Feedback:** Stay away from providing negative feedback. While the feedback may contain critical information, it should be delivered in a constructive manner. Constructive feedback enables superior-subordinate communication to be more effective.
9. **Proper Media Selection:** Managers should make an informed decision about the communication medium to use. Simple messages, such as those arising from face-to-face interaction or meetings, should be communicated orally. For the delivery of complex messages, the use of written forms of communication should be encouraged. For important messages, written communication such as memos, notices, and so on can be used.
10. **Flexibility in Meeting the Targets:** For effective communication in an organization the managers should ensure that people are meeting their targets promptly without skipping the formal channels of communication. Employees should not be subjected to undue pressure to achieve their goals.

2.14. CLASSROOM COMMUNICATION

Teaching is a collaborative social activity in which both the teacher and the students participate. It is critical, therefore, for them to communicate in both directions in order to initiate learning (Sitihendon and Khalijah, 2007). Additionally, direct communication between a teacher and students enables the teacher to receive immediate feedback that assists him or her in determining the students' comprehension of what was taught.

The teacher's communication skills can be enhanced as a result of this feedback. As our social system undergoes rapid change, the teaching-learning environment is also undergoing rapid change. The explosion of information that has occurred as a result of increased access to various modes of mass communication has increased learners' awareness. As a result, they now hold their teachers to a higher standard than ever before. A teacher's role and profile are also evolving, and she is required to perform a variety of functions. While the teacher's primary responsibility is to provide information, she also serves as a counsellor, mentor, and guide. The teacher must coordinate assignments, perform numerous managerial functions, and incorporate technology into the classroom.

Thus, pedagogy, social interaction, management, and technology are all critical teacher activities, and communication plays a critical role in all of

them. As discussed in the previous section, classroom communication is purposeful, affirming, and pragmatic in nature. It occurs between the teacher and the students, as well as between the students themselves, in both formal and informal settings. It entails the teacher lecturing, speaking, describing, explaining, and illustrating, as well as engaging students in debate, dialogue, and discussion. Learners express their difficulties through questions, doubts, and inquiries, which the teacher must respond to and address effectively. This approach is advantageous because it maximizes feedback, warmth, and interaction. However, the limitation is that it is a teacher-centered approach based on the principles of 'teaching by telling' and 'learning by listening,' with the teacher bearing the primary responsibility for teaching. It is worth noting that, even in the presence of a teacher, students may remain passive recipients of information. Even if they express disinterest or passivity, an alert teacher can still exert control over them by employing a variety of interactive techniques aimed at arousing and maintaining students' interest. However, the problem can become acute when a student's apparent interest in the lecture/lesson is masked by inappropriate facial expressions and body language, and his/her mind wanders away from the topic being discussed in class. Speaking and listening begin at an early age and continue throughout our lives, even after we have developed our basic speech and language skills. We are constantly expanding our vocabulary, improvising our expressions, and refining our thought processes in Classroom Communication. Both speaking and listening are critical classroom skills. A teacher must be an effective communicator while also being an attentive and patient listener to his or her students. Active listening is distinct from passive listening in that it entails activities such as hearing, comprehending, or associating meaning to what is heard, as well as judging and reflecting on it.

2.14.1. Two-Way Communication

Teaching is a process that requires two-way communication between the teacher and the students in order to transfer information from the teacher to the students. Additionally, interpersonal communication allows for more feedback because both sender and receiver can decipher facial expressions, body movements, and cross-examine one another in order to resolve their doubts/questions. However, as the number of participants in the communication activity increases, feedback becomes less effective, posing a problem for the teacher.

2.14.2. Class Size and Communication

This is also prevalent in group communication, most notably in small groups. However, as a group's size grows, the level of communication suffers. However, as a group's size grows, the level of communication suffers:

1. **Individual Instruction:** Even the term 'class' implies a group of students. Nonetheless, some students require customized instruction to meet their unique educational needs. Individual instruction is usually between two individuals and thus falls under the category of interpersonal communication. It enables the sender and receiver to monitor each other's facial expressions, gestures, and body language through a variety of sensory channels. It enables more effective communication in which there is less room for misunderstanding, persuading, or motivating another person. When technology is used to deliver instructions, such as computer-based learning, the instruction becomes more personalized as the learner works and learns on his or her computer.
2. **Small Group Instruction:** Teaching and skill development are more conducive in small groups of 15–20 learners. Teachers can identify and remember learners in small group instruction and use their names to build rapport with them. It becomes relatively straightforward to address learners' unique learning needs. Small group instruction may take the form of direct instruction or may employ a variety of teaching-learning modes. Apart from lectures, various other teaching methods such as seminars, discussions, debates, tutorials, brain storming, and problem solving can be effectively adapted and used in small groups. Large group instruction: When the size of a group is large, it can introduce constraints into the communication process and reduce the level of interactivity between the source and receivers. Additionally, the physical environment may limit the visibility or audibility of the source. Generally, the lecture method is used to impart knowledge to large groups of people. The use of information and communication technology to meet the needs of large and dispersed classes in the same or different locations is becoming more prevalent.

2.14.3. Planning Class Room Communication

As you have read, educational communication is intentional, positive, and pragmatic, as well as a systematic and planned activity. It has specific objectives that are directly related to the permanent acquisition of knowledge or development of new skills. The various steps such as selecting an appropriate topic, setting realistic goals, getting to know the learners, and organizing the content properly, all apply to planning classroom communication as well.

2.14.3.1. The Teacher's Role

Because the primary goal of teaching is to develop students' academic and intellectual abilities, the teacher must be well-prepared with facts and should analyze the subject being taught. Along with meeting the needs of average students, she must also meet the intellectual needs of gifted students, for which she must be well prepared. She must foster creativity and innovative thinking in order for students to present their arguments with appropriate reasoning, as opposed to rote learning. Additionally, she must instill proper values in her students in order for them to face the economic, social, and cultural challenges that lie ahead, all of which require the teacher's communication skills. Effective communication requires the ability to communicate clearly and precisely, to explain well, to highlight important points, to be a good listener, and to interact.

2.14.3.2. Design and Presentation

The first and foremost step in classroom communication is to define the objectives of communication clearly and realistically so that these can be met within the specified timeframe. Based on these objectives, a message or content must be created. This message or content may be verbal, written, pictorial, or symbolic. Verbal communication entails direct communication in the form of lectures, presentations, and speeches, among others. Written communication includes information that has been published in the form of books, research papers, slides, and 3 X handouts. A pictorial message may consist of drawings, graphs, or other visual elements, whereas symbolic messages are used in subjects such as mathematics, chemistry, and physics. Occasionally, rhetorical messages are used in classroom communication as well.

Rhetoric is the art of oration, which entails the ability to speak for an extended period of time with wit, humor, force, and strength. Whichever

format is chosen, the message should be straightforward, lucid, and clear, and delivered in an engaging manner. It should be timely, relevant, and pitched appropriately. Often, in our efforts to share our knowledge and expertise, we pitch our message extremely high, which can be confusing for the learner.

At times, we may express our prejudices and biases, which must be vigorously resisted. Apart from being bias-free, the message must be credible and persuasive enough to encourage learner participation. Several times during a rambling monotonous lecture, you would have to exert effort to maintain your alertness. To facilitate communication, appropriate voice modulation, facial expressions, and body language must be used.

2.14.4. Developing Classroom Culture

They determine how students will address the teacher, the degree of familiarity that is acceptable in communication, and the acceptable level of noise in the classroom, among other things. This varies by institution—private or public—and is also governed by the society in which we live, as classrooms are a component of the larger societal system. For a class to function effectively, a harmonious culture must be developed, and the importance of respecting the viewpoint of others should be emphasized. The class structure should remain democratic, with due regard for the teacher. It will be difficult to teach if students constantly converse because no one will be able to hear one another. Similarly, communication may not be democratic if a small group of vocal students dominates the interaction, while shy and timid students remain silent unless prompted. At times, assertive male students may exert dominance over female students or students from less vocal cultures. Interjections frequently, loud speech, and shouting, for example, should be discouraged and limited at all costs.

2.14.5. Developing Communication Skills in Learners

In the previous section, we discussed in detail various communication skills such as verbal, writing, listening, and questioning that must be instilled in teachers and learners alike. Students must be encouraged to express their opinions and views or to share their reservations in order to strengthen their reasoning abilities and faculties. They should be capable of debating, challenging, analyzing, and defending ideas. Communication may also entail looking beyond what is said to ascertain what is not said and/or what the communication transaction's missing links were. Additionally, non-verbal cues convey meaning. For instance, if the teacher shuffles the papers

or looks away, this may convey the message that the students' comments are dismissed. Maintaining eye contact, smiling, and nodding, for example, all contribute to building rapport with students.

Occasionally, deliberate efforts must be made to maintain eye contact with those who are shy and timid and do not freely participate. Effective learning requires that learners be able to communicate their knowledge. Teachers must promote communication in the classroom through discussions and ensure that each student comprehends the communication. Communication skills can also be developed through activities followed by presentations made by the learners. Additionally, students require a safe environment in which they are not afraid or inhibited from communicating with their teachers.

2.14.6. Types of Classroom Communication

Classroom communication can be classified as verbal, nonverbal, or written. Verbal communication is the exchange of information via sounds and languages. Teachers can use verbal communication to address a single student or the entire class. For instance, a teacher may ask a student to rise, which is an example of verbal communication.

Nonverbal communication is a term that refers to communicating without using words through body language, gestures, facial expressions, voice tone and pitch, and posture. For instance, if a teacher nods their head in agreement with a student as they speak, this can be encouraging or indicate that the teacher agrees with the student.

Written communication is the act of transmitting or receiving information via the written medium. For instance, a teacher may assign a written assignment to assess students' knowledge or present lecture slides or notes to explain complicated material.

Chapter 3

Concepts of Teaching-Learning

CONTENTS

3.1. Introduction 74
3.2. Concept of Teaching 74
3.3. Theories of Teaching 78
3.4. Models of Teaching 82
3.5. Concept of Learning 86
3.6. Learning Process 93
3.7. Principles of Learning 100
3.8. Difference Between Teaching and Learning 102

3.1. INTRODUCTION

It is widely acknowledged that teachers are usually not born but made. Good teachers constantly and deliberately work to improve their knowledge and skills. Understanding the teaching-learning process in greater depth is one of the prerequisites for becoming a successful teacher. This promotes a deeper understanding of the teaching profession as well as the educational process. Teaching is a scientific process that consists of three primary components: content, communication, and feedback. The teaching strategy has an impact on student learning. It is always possible to change, improve, and grow. The new teaching-learning activities, and thus the system's flexibility; and "The learner's terminal behavior have pointed out that the entire system of teaching has four steps such as Planning of teaching, Organization of teaching, Identification of suitable teaching, and Managing teaching." The chapter discusses the characteristics and activities associated with teaching and learning.

3.2. CONCEPT OF TEACHING

Teaching is one of the most important tools in education, and its purpose is to provide a deeper grasp of concepts and abilities. It is referred to as a process in which the teacher instructs either a single student or a group of students. It is the act of instructing students in a classroom of a feeder school or another institution. Making teaching successful is one of its most important functions (Figure 3.1).

Figure 3.1. Teaching and learning are inextricably related.

Source: https://images.theconversation.com/files/122927/original/image-20160518-9487-3neqz2.jpg?ixlib=rb-1.1.0&q=45&auto=format&w=926&fit=clip.

Teachers are required to teach a specific curriculum during a specific time period. Some define it as a method of attending to students' wants, concerns, and challenges, which helps them grow as individuals and hence learn the subjects better.

In today's context, the term "teaching" refers to schools and schooling. Going through the functions and responsibilities listed in a teacher's job profile is one way to comprehend the position of the teacher. In general, a teacher's role is to create a better learning environment in which students love learning, as well as to serve as a mentor, advisor, and friend to his or her students.

These duties and responsibilities will provide you with insight into the key characteristics that a teacher should have in order to teach effectively. Whether it is a primary school teacher or another type of instructor, their aim is the same: to provide information and help students learn.

3.2.1. Teaching Definition

1. **H. C. Morrison:** Teaching is an intimate contact between the more mature personality and a less mature one.
2. **Jackson:** Teaching is a face to face encounters between two or more persons, one of whom (teacher) intends to effect certain changes in the other participants (students).
3. **J. B. Hough and James K Duncan:** Teaching is an activity with four phases, a curriculum planning phase, an instructing phase, and an evaluating phase. This definition presents the organizational aspect by which we can describe and analyze the teaching process.
4. **N. L. Gage (Democratic point of view):** Teaching is interpersonal influence aimed at changing the behavior potential of another person.
5. **Clerk:** Teaching refers to activities that are designed and performed to produce in student's behavior.

3.2.2. Characteristics of Teaching

The characteristics of teaching are as follows:

- Teaching is a successful interaction between the teacher and the students.
- Teaching is both an art and a science. Teaching is an art because it requires the use of one's talent and creativity. Teaching as science entails a set of techniques, procedures, and skills that can be

studied, described, and improved systematically. A good teacher enriches the basic repertoire with creativity and inspiration.

- There are various types of teaching, such as formal and informal raining, conditioning, or indoctrination, and so on.
- Communication is the most important skill in teaching.
- Teaching is a three-pronged process with three poles: educational objectives, learning experiences, and behavioral change.
- Teaching should be well planned, with the teacher determining the objectives, teaching methods, and evaluation techniques.
- Teaching is a process of suggesting rather than dictating.
- Good teaching is democratic, with the teacher respecting the students and encouraging them to ask questions, answer questions, and discuss issues.
- Teaching gives students guidance, direction, and encouragement.
- Teaching is a collaborative activity in which students participate in various classroom activities such as organization, management, discussion, recitation, and evaluation of results.
- Teaching is kind and sympathetic, and a good teacher helps children develop emotional stability.
- Teaching is curative, and the teacher must solve students' learning problems.
- Teaching enables children to make life changes.
- Teaching is a professional activity that contributes to children's harmonious development.
- Teaching stimulates students' thinking abilities and guides them toward self-learning.
- It is possible to observe, analyze, and evaluate teaching.
- Teaching is a specialized task that can be viewed as a collection of component skills for achieving a specific set of instructional objectives.

3.2.3. Teaching and Related Activities

Education proponents have examined the concept of teaching and attempted to distinguish it from related concepts such as training, conditioning, and indoctrination. The term "teaching" refers to any action taken with the intention of causing another person to learn. In this way, teaching differs from

simply telling or showing. Teaching entails face-to-face interactions, and the teacher's actions are conducive to student learning. Typically, teaching acts fall under a broad category of activities that includes explaining, describing, demonstrating, exemplifying, guiding, and so on. In this context, "education" refers to specific information of thought, feeling, and action that is distinct from mere socialization. The goal of education is to create critical reflective agents. Teaching is characterized from related activities such as training, conditioning, and indoctrination in this context (Figure 3.2).

Figure 3.2. Training is used much less frequently than conditioning or indoctrination.

Source: https://th.bing.com/th/id/R.a420df6c5f6f04d6d892af16e9807351?rik=yKllxAYkxTs2EA&riu=http%3a%2f%2fwww.mccrudden-training.co.uk%2fwp-content%2fuploads%2f2016%2f03%2fcoaching-skills-training.jpg&ehk=N7E2KHTHBJoeHDzxvIZo%2faGp0whxzkaC5YHKgk14u%2b4%3d&risl=&pid=ImgRaw&r=0

The emphasis of training is on the development of skill rather than knowledge. Training is sometimes reserved for use in the context of teaching routine tasks that require total mastery. Teaching someone a skill necessitates the development of the learner's ability to respond to the unexpected, to understand what he or she is doing and why, and to be intelligent and reflective in the application of his or her skill. When compared to teaching, conditioning is usually operant conditioning rather than classical conditioning. Operant conditioning may appear to be nothing more than a

systematic form of training and thus teaching. Common school practices such as rewarding good behavior can be described as creating a situation in which the occurrence of a reinforcer is dependent on the occurrence of a response, which is the procedure for operant conditioning. Conditioning will have occurred in this sense if the probability of the desired response in the specific circumstances increases as a result of the child's experience with the positive reinforcer. Conditioning can change a child's behavior without the child being aware of the change or having any idea why behaving in this manner might be appropriate in? The specific circumstances. Processes that bypass human rationality are generally regarded as unacceptable in an educational program. Such processes appear to be less of a form of teaching and more of a last resort when traditional instruction fails. On the other hand, operant conditioning can be used to describe rational processes such as a person learning a fact by reading or hearing statements in its favor and evaluating the evidence. In this context, teaching is not inconsistent with conditioning students, but only with certain methods of conditioning students. Indoctrination, in its broadest sense, is considered synonymous with education. Indoctrination is related to doctrine teaching etymologically. A doctrine is a set of beliefs that provides an explanation or interpretation of the world and suggests how humans should behave morally in light of the general features of existence identified by the system.

To summarize, teaching should not only aim to encourage beliefs that are supported by evidence, but also to develop students' ability to gather evidence and assess its sufficiency for themselves. A learning program may include learning the most dependable methods humans have developed for discovering the truth about themselves and the world. When teaching skills, the educator makes students aware of the reasons for what they are doing and motivates them to be intelligent and reflective in the application of their abilities. And, while the environment may influence students' behavior, teachers expect students to act based on their perceptions of what they should do. It is critical to prepare students for life by developing their capacity and intelligent freedom of choice rather than simply acquiring thought, feeling, and action (Rober, 1987).

3.3. THEORIES OF TEACHING

Broad categories of teaching theories are given in subsections.

3.3.1. Formal Theory of Teaching (Philosophical Theory)

These theories are established on metaphysical and epistemological assertions. There is an earlier theory which reflects the current social practices.

3.3.1.1. Meutic Theory of Teaching

According to this theory, the teaching process aids in the recollection or unfolding of knowledge through questioning techniques. The teacher imparts his knowledge to the child on a conscious level. This theory focuses on self-realization. The Socratic Method is critical to this theory. The teaching process is heavily influenced by heredity.

1. **The Communication Theory of Teaching:** This teaching theory is based on the assumption that the teacher possesses all knowledge and information that the student does not. The best way for the student to learn this knowledge is for the teacher to present, explain, demonstrate, and perform it in the classroom. This theory also assumes that the child is like a clean slate, and that the teacher can imprint anything on it through his mode of communication. As a result, it is intended as a communication practical theory of teaching.
2. **The Molding Theory of Teaching:** John Dewey is an advocate of this molding theory of teaching that focuses on imparting knowledge to students. The third theory focuses on the shape, form, and mold of the students' behavior. The fundamental assumption about human nature that this theory considers is that human personalities are formed, shaped, and molded by their environment.
3. **The Mutual Inquiry Theory:** The main assumption of this theory about the nature of knowledge is that the entire body of recorded facts as 'information' knowledge, which is generally substituted for inquiry in schools and outside of schools. True knowledge is the application of efficient methods and relevant information to solve problems. This teaching theory is clearly applicable to research and art. This theory assumes that everyone has the ability to learn new things through mutual inquiry. It implies that a teacher has a model in mind to use in a particular situation, and the student chooses the model for mutual inquiry.

3.3.2. Descriptive Theory of Teaching

Descriptive theory is a theory that is based on empirical evidence and observation. The goal of descriptive theory is to predict the relationship and effectiveness of teaching variables. Gardon and Bruner developed two types of teaching theories:

- Instruction theory of teaching; and
- Prescriptive theory of teaching.

3.3.3. Normative Theory of Teaching

Because it is difficult to control human subjects in an experimental setting, a normative theory of teaching may be developed. The learning theories were developed under controlled conditions through the use of experiments and animals. The normative theory explains the relationship between teaching variables based on observations made under normal teaching conditions. This category has four theories of teaching:

- The cognitive theory of teaching
- Theory of teacher-behavior
- Psychological theory of teaching and
- General theory of teaching

Because the learning theories were developed through the design of controlled experiments, they have less generalizability. Because it deals with human behavior, teaching theory should be highly generalizable. Experiments on human subjects cannot impose more stringent controls. As a result, normative theory of teaching is required.

3.3.3.1. The Cognitive Theory of Teaching

According to N. L. Gage, one teaching theory cannot serve the purpose of education. There should be more than one teaching theory because teaching can be examined in four ways:

1. **Types of Teacher's Activity:** A teacher has to lay several roles in teaching. Many different types of activities are included in teaching, such as philosopher, counselor, advisor, motivator, demonstrator, curriculum planner, and evaluator.
2. **Three Types of Educational Objectives have been Identified by Bloom:** Cognitive, affective, and psychomotor. Tolman has

assigned field cognition mode and drive discrimination field expectation and more patterns as things to learn.

3. **Different Types of Learning Theories:** Different families of learning theories may be used in teaching; philosophical theories of learning may also be used (mental discipline, unfoldment, and approbation). Psychological theories of learning: S R family, Reinforcement theory and Insight learning theory. Each family has a unique perspective on the teaching process.
4. **Types of Components of Learning:** Neal Miller states four components of learning, drive, cue, response, and reward. Each component necessitates a unique set of teaching activities.

3.3.3.2. Theory of Teacher-Behavior

D. G. Ryan attempted to explain the concept of teacher-behavior and developed a teacher behavior theory. M. Meux and B. O. Smith have defined the term teacher-behavior. "Teacher behavior consists of those acts that the teacher typically performs in the classroom to induce learning." The theory of teacher behavior, which is based on two postulates, also explains the relationship of variables:

1. **The Teacher's Behavior is Social in Nature:** The teacher completes his tasks in groups. Teacher behavior is concerned with the verbal and nonverbal interaction in the classroom. Both the teacher and the students participate in the interaction process. The teacher or students will carry out the initiation and response activities. They both have an impact on one another. As a result, it is classified as social behavior.
2. **Teacher Behavior is Relative:** Teacher's classroom activities are based upon social situations. Teachers' activities are the result of social conditions and are linked to the cultural settings in which they teach. Teacher-Behavior is good or bad, effective, and ineffective, it can be evaluated with reference to a particular culture's value system and set of objectives. As a result, teacher behavior is a matter of perspective.

3.3.3.3. Psychological Theory of Teaching

According to this theory, teaching is a sort of contractual relationship between the teacher and the students. The relationship consists of specific activities that the teacher must perform, such as analyzing teaching asks,

determining learning goals, identifying entering behavior, and selecting teaching strategy. The teacher creates teaching tasks based on his or her own experiences and insights. He makes a determination about the pupil's developmental stage. The teacher locates his cognitive map's positioning. The importance of education cannot be overstated. The value helps others to grow and learn to give one's best, which benefits others but not oneself, to do good without expecting anything in return, and so on.

3.3.3.4. General Theory of Teaching

Clarke developed a general theory of teaching. It is assumed that teaching is a process that is designed and carried out in order to change the behavior of students. Teaching activities can be very diverse, and they can also vary depending on the level of teaching and the objectives. In the teaching process, all of these combinations are possible. This theory restricts educational activities to those that are acceptable in a democratic society.

3.4. MODELS OF TEACHING

The traditional definition of teaching is the process of designing and creating environments. Students acquire knowledge through their interactions with their environments, and they study how to learn (Dewy, 1916). A teaching model can be characterized as a representation of the teaching and learning environment, including the behavior of teachers and students when the model is being used to convey the lesson. Teaching models involve students in rigorous cognitive and social tasks and teach them how to use them constructively. Models of instruction are unique instructional designs that are developed in accordance with the applicable learning theories. It serves as a comprehensive blueprint for curriculum development, including instructional materials design, lesson planning, teacher pupil roles, and supporting aids. Joyce and Weil (2014) provide a definition. A teaching model is a description of the learning environment in which it is employed, as well as our conduct as teachers when the model is used. According to Eggen (1979), Models are prescriptive instructional strategies that aid in the achievement of specified instructional goals. Teaching models are, in fact, learning models. It assists pupils in acquiring knowledge, concepts, abilities, values, a style of thinking, and ways of expression. Thus, instructional models instruct students on how to learn. Indeed, the most important long-term impact of training may be the student's greater capacity for future learning. Thus, the primary goal of instructional models is to develop powerful learners.

3.4.1. Characteristics of a Good Teaching Model

The following are the primary characteristics of an effective teaching model:

- Each model was developed in accordance with a certain theory of learning;
- Constructing a conducive learning environment in the classroom Interaction between the teacher and pupils that is effective;
- Utilization of relevant tactics with forethought;
- The educational process is organized methodically, sequentially, and rationally;
- Teachers and students have distinct and defined roles.

Significant opportunity for supporting material Ensures active participation of the entire class It increases students' aspiration, motivation, and enthusiasm in learning. Each model fosters and strengthens the student's cognitive framework.

3.4.2. Elements of Models of Teaching

A teaching model's elements describe its structure, process, and instructional aids. A teaching model consists of a syntax, a social system, a reaction principle, and a support system. The following are the detailed descriptions:

1. **Syntax:** It is the model's steps or phases that are being presented to the class. It demonstrates the logical and sequential sequence of teacher-student interactions during the instructional method. It details the model's whole course of activity.
2. **Social System:** A model's social system explains the nature of its learning environment. It explains the teacher's function and relationship with the students throughout the phases, as well as the process of lesson creation. Due to the fact that each model is unique, the function of the teacher and students within each model may vary according to the learning theory upon which the model is based. Additionally, it varies in phases.
3. **Principle of Reaction:** This is a continuation of the social system. It discusses the rules for responding to students' responses during classroom interaction. The teacher's response must be consistent with the theory upon which the model is based. When students' responses/behavior are consistent with expected level responses, the instructor reaction is sought for reinforcement. It is determined by the model's family.

4. **Support System:** It encompasses all instructional aids utilized in a teaching model. For example, books, encyclopedias, video clips, slides, newspapers, tabloids, expert opinions, films, and specimens.

3.4.3. Effect of Models of Teaching

Teaching models have a significant positive effect on students' behavior. Bruce Joyce classified the influence as either instructional or nurturing. The direct effect of education on students' cognitive, emotional, and psychomotor domains is referred to as instructional effects. Nurturant effects are the unintended consequences of the teacher's model. It is the additional achievement earned by pupils as a result of the classroom interaction's distinctive nature. Several examples include the development of problem-solving abilities, analytical, and critical thinking abilities, social skills, and tolerance.

3.4.4. Families of Teaching Models

Joyce and Weil (2014) classified teaching models into four families. The classification was determined by the theoretical underpinnings and primary objective of the teaching methodology. The four families are described in full below:

1. **The Information Processing Family:** This family of models focuses on the child's cognitive activities. It entails scientific inquiry for the purpose of gathering original data, arranging it, and appropriately keeping it. Some models impart knowledge and concepts to learners, while others place a premium on concept formulation and hypothesis testing. Still others foster creative thinking. In information processing Model, Joyce, and Weil (2014) listed eight models (Table 3.1).

Table 3.1. Models of Information Processing

Models	Developers (Redevelopers)
1. Inductive thinking model (classification oriented)	Hilda Taba (Bruce Joyce)
2. Concept attainment model	Jerome Bruner (Fred Lighthall, Tennyson and Cocchiarella, Bruce Joyce)
3. The picture-word inductive model	Emily Calhoun
4. Scientific inquiry model	Joseph Schwab
5. Inquiry training model	Richard Suchman (Howard Jones)
6. Mnemonics model (memory assists)	Michael Pressley (Joel Levin, Richard Anderson)
7. Synectics model	William Gorden
8. Advance organizer model	David Ausubel (Lawton and Wanska)

2. **The Social Family:** This family model's objective is to foster synergy (collective energy) in the classroom in order to solve current issues of personal, societal, national, and worldwide significance. Social models assist students in developing their abilities to solve problems independently, a sense of connection to society, and in becoming responsible citizens of the country (Table 3.2).

Table 3.2. Social Models

Models	Developers (Redevelopers)
1. Partners in learning	David Johnson, Roger Johnson
2. Structured inquiry	Robert Salvin (Aronson)
3. Group investigation	John Dewy, Herbert Thelen
4. Role playing	Fannie Shaftel
5. Jurisprudential inquiry	Donald Oliver, James Shaver

3. **The Personal Family:** Personal models begin with the individual's sense of selfhood. This family's primary focus is on individual consciousness and the development of a distinct personality. Personal family models seek to help pupils understand themselves so that they can shape their futures. The cluster of personal models places a premium on the individual perspective and aims to promote constructive interdependence by raising individuals' self-awareness and sense of responsibility for their own futures (Table 3.3).

Table 3.3. Personal Models

Models	Developers
1. Nondirective teaching	Carl Rogers
2. Enhancing self esteem	Abraham Maslow

4. **The Behavioral System Family:** This family is mostly concerned with behavior modification. Human beings are viewed as self-correcting communication systems that adapt their behavior in response to information about how successfully activities are completed. The cornerstones of models in the behavior family are preset objectives, observable behavior, explicitly stated tasks and techniques, feedback, and reinforcement (Table 3.4).

Table 3.4. Models in the Behavior Family

Models	Developers
1. Mastery learning	Benjamin Bloom, James Block
2. Direct instruction	Tom Good, Jere Brophy, Carl Bereiter, Ziggy Engleman, Wes Becker
3. Simulation	Carl Smith, Mary Smith
4. Social learning	Albert Bandura, Carl Thoresen, Wes Becker
5. Programed schedule (task performance reinforcement)	B. F. Skinner

Models of teaching are extremely effective teaching tactics that are used to convey specific information to students. The nature of the subject, the presenting manner, and the classroom setting will dictate which model of instruction the instructor should use to teach the subject. However, teachers, and student teachers should be familiar with the concept and numerous teaching models. As a result, they can apply teaching approaches in their professional lives and create awe in their classroom interactions.

3.5. CONCEPT OF LEARNING

Learning is about a change: the change brought about by learning a new skill, comprehending a scientific law, or altering one's attitude. The change is not merely coincidental or natural, as our appearance changes as we get older. Learning is a relatively permanent change that is usually brought about on purpose. We set out to learn when we take a class, read a book,

or read a discussion paper! Other types of learning can occur without any planning, such as through experience. In general, when we learn something, we want to remember and understand why it happened so that we can do it better the next time (Figure 3.3).

Figure 3.3. Learning is a passive process of memorizing information that requires an external reward.

Source: https://cdn2.rsc.org.uk/sitefinity/images/education/to-be-deleted/inside-the-rsc_2014_rob-freeman_21999a6754fee74f76138967eff00002337f7.tmb-img-912.jpg?sfvrsn=1d822e21_1.

Understanding is simply seeing relationships or patterns, and applications require nothing more than training transfer. According to humanists, learning is an individual's personal act of fully utilizing his potential. For the learning process to be successful, instructional activities must be based on the learners' basic needs. It is an insatiable curiosity that helps in identifying, discovering, drawing in from the outside world, and making what is drawn in a real part.

The learning environment must allow the learner to progress at his or her own pace. It should allow for continuous assessment and use of feedback as part of the learning process. Connectivists consider learning to be a state of being. It is an ongoing pattern of attitudes and actions used by individuals and groups to deal with unexpected, new/novel, messy, obtrusive events, and situations. It occurs in a variety of ways, including through participation in professional communities, personal networks, and the completion of work-

related tasks. It is a life-long process that is not separated from work-related activities. They present a learning model that acknowledges that learning is no longer an internal, individualistic activity. It teaches students how to thrive and advance in the digital age of technology.

3.5.1. Definition of Learning

When one person imparts knowledge or skills to another, the action is commonly referred to as teaching. Imparting can refer to sharing experiences or communicating information, such as a lecture. Teaching is regarded as an art as well as a science. As an art, it emphasizes the teacher's imaginative and artistic abilities in creating a worthwhile scenario in the classroom for students to learn. As a science, it sheds light on the logical, mechanical, or procedural steps that must be taken in order to achieve effective goal achievement. Different educationalists have different perspectives on the concept of teaching. "Teaching is an intimate contact between a more mature personality and a less mature personality that is intended to further the latter's education."

Morrison (1934), Dewey (1934) expressed this concept of teaching by an equation. "Teaching is learning as selling is to buying."

In the words of John Brubacher (1939), "Teaching is arrangement and manipulation of a situation in which there are gaps or obstructions which an individual will seek to overcome and from which he will learn in the course of doing so."

B.O. Smith defined teaching as "Teaching is a system of actions intended to induce learning."

According to Gage (1963), "Teaching is a form interpersonal influence aimed at changing the behavior potential another person."

Smith in 1963 further extended the definition of teaching "Teaching is a system of actions involving an agent, an end in view and a situation including two sets of factors those over which the agent has no control (class size, characteristics of pupils, physical facilities, etc.) and those which he can modify (such as techniques and strategies of teaching."

The International Encyclopedia of Teaching and Teacher Education divides teaching into three categories:

- The term "teaching as success" denotes that learning is involved in teaching. Teaching involves learning and can be defined as an activity that has a direct impact on learning;

- Teaching as an intentional activity implies that while teaching does not logically imply learning, it can be expected to result in learning; and
- Teaching as normative behavior denotes action taken with the intention of causing another to learn. It refers to a group of activities, the most important of which are training and instruction, as well as indoctrination (Green, 1968). Training is made up of activities that shape skills and other behavior, whereas instruction and indoctrination are made up of activities that induce knowledge and beliefs.

Teaching can be viewed as a type of problem-solving and decision-making that shares many characteristics with the work of physicians. This conceptualization has resulted in a body of research that has investigated teaching decision-making, with a particular focus on the information about students those teachers use to make decisions and the way they adapt instruction to individual pupil needs (Calderhead, 1995).

3.5.2. The Nature of Learning

At birth, a newborn child is helpless. He is reliant on others. But, in the end, he learns a few things. He learns to crawl, stand, walk, run, eat, speak, and dress, among other things. The learning process continues until death. Even adults continue to learn and expand their knowledge throughout the course of their daily lives. What motivates a person to learn? He learns as a result of having to adjust to a changing environment. On the one hand, there is environmental stimulation.

There are, on the other hand, innate dispositions-instincts, and emotions. A person, guided by these dispositions, continues to learn, constructing, and reconstructing his experience throughout his life, at all stages.

3.5.3. Characteristics of Learning

Teaching and learning are inextricably linked. The goal of teaching is to produce learning in the learner. A teacher has predetermined goals and objectives that must be met in order for learning to take place. When it comes to learning, the importance of teaching cannot be overstated. Learning, like teaching, has its own set of characteristics (Figure 3.4):

Figure 3.4. Characteristics of learning.

1. **Learning is a Continuous Process:** Learning continues throughout one's life. Learning can be formal or informal, direct, or indirect. When a learner acquires knowledge, skills, habits, attitudes, and aptitudes, he develops knowledge, skills, habits, attitudes, and aptitudes.
2. **Learning is Change in Behavior:** Behavioral changes can be used to measure the outcome of the learning process. This transformation can take any form. It can be either desirable or unfavorable. However, these changes should occur in a desirable manner, i.e., in a positive direction. All three aspects of human behavior are included in learning. As a result, it encompasses cognitive, affective, and conative aspects of the mental process.
3. **Learning is a Universal Process:** Learning is an all-encompassing process. It can occur anywhere. Learning is a process that all living things go through. Learning is a lifelong process for people of all cultures.
4. **Learning is Purposive and Goal-Oriented:** Learning is Purposive and Goal-Oriented: It is goal-oriented in the sense that the teacher always teaches with learning objectives in mind. If we do not have an aim and a goal, the learning process will

be ineffective. We can progress toward pre-determined learning objectives through the learning process. The learner progresses toward a predetermined goal as he or she learns.

5. **Learning is a Process of Progress and Development:** Learning can take place in any direction. These instructions can be either desirable or undesirable. Through learning, we hope to guide an individual's development in a positive direction. We do not want a child to learn bad habits like stealing or pick-pocketing. As a result, learning should result in gradual changes in the learner's behavior.
6. **Learning is the Organization of Experiences:** The acquisition of new experiences is the foundation of learning. Learners' behaviors change as a result of new experiences. New learning experiences emerge as a result of the learner's prior experiences.
7. **Learning Occurs Due to Activity and Environment:** Interaction with one's surroundings is critical to the learning process. The more a child interacts with his or her surroundings, the more they learn. The absence of activity and interaction reduces the child's learning quality. The children gain experience from these interactions. Children's behavior changes as a result of these interactions.
8. **Learning Helps in Achieving Teaching-Learning Objectives:** The goals, aims, and objectives of teaching and learning situations are not the same. The learning process aids in the achievement of teaching objectives. Individual behavior should change as a result of learning. This transformation occurs as a result of the growth of knowledge, insight, interests, skills, and attitudes. As a result, the learning process is critical for achieving teaching-learning objectives.
9. **Learning is the Fundamental Process of Life:** A person cannot progress unless he or she learns. It serves as the foundation for the advancement of society and civilization. The relationship between stimulus and response is referred to as learning.
10. **Learning is a Relationship between Stimulus and Response:** If a person reacts in accordance with the task to be learned, he is considered to be a learned person. A person learns reactions to stimuli associated with the environment and other aspects of life through learning.

11. **Learning is Transferable:** The knowledge gained in one situation can be applied in another. The knowledge gained in one situation aids in the acquisition of knowledge in another. This is referred to as learning transfer. The learner must be careful not to let prior knowledge interfere with the acquisition of new knowledge and experiences.

3.5.4. Importance of Learning

We can infer the importance of learning in education based on its nature and characteristics. Learning distinguishes humans from animals that are trained rather than taught. Parents enroll their children in school so that they can learn. They want a good education for their child. The terms education and learning are sometimes used interchangeably. Learning improves the learner's cognitive ability. The learner gains knowledge, develops skills, and develops an attitude as a result of learning. Learning aids in the overall development of a person's personality. Learning influences all aspects of behavior, including skills, knowledge, attitudes, personality, motivation, and so on.

3.5.5. Types of Learning

There are several types of learning:

1. **Skill Learning:** The child learns from the moment he or she is born. His bodily organs adapt to the situation. He moves his legs and starts crawling. He learns other motor skills, such as walking, speaking, drawing, writing, reading, playing music, cycling, and swimming, over time.
2. **Perceptual Learning:** The child receives sensations through his sense organs and assigns meaning to each sensation. The infant's first sensations are undifferentiated to the point where he cannot distinguish between one object and another. Over time, he recognizes and perceives specific objects separately.

   Psychologists have explained the various types and processes of perceptual learning. They define conceptual learning as contact with a sense object. Pure sensation is the first stage of perceptual learning and is indeterminate perception. The object is revealed as endowed with its attributes and characteristics in the second step, determinate perception.

3. **Conceptual Learning:** Perceptual learning is followed by conceptual learning because concrete thinking leads to abstract thinking. A concept is a broad idea with a universal character. A child sees a specific cow and forms some ideas about a cow with certain characteristics. The ideation in this case is based on a single cow.

   This is the specific percept, but when a child sees a group of cows with some common characteristics, he locates certain general qualities in all the cows and forms a concept of 'cow' based on these. This is based on a percept that has been generalized.

   As a result, the child progresses from particular to general and develops a plethora of concepts, both concrete and abstract, over time. This is the foundation of all thinking and conceptual learning. When a few concepts are learned, they serve as the foundation for building the superstructure of knowledge and education through association and assimilation.

4. **Associative Learning:** This aids conceptual learning in amassing a wealth of knowledge. Through association, new concepts are associated with previous concepts, resulting in knowledge.

5. **Appreciational Learning:** While conceptual learning is on the affective side. A child uses his inborn trait of esthetic sensibility from the start, and acquires concepts tinged with appreciation.

6. **Attitudinal Learning:** Attitudes are generalized dispositions toward specific concepts, things, people, or activities. A child develops an affectionate attitude toward his mother, a reverent attitude toward his teacher, and a sense of belonging to his family. His attitude toward play is extremely positive. All of this he gradually learns and adopts.

3.6. LEARNING PROCESS

The underlying ability required of a teacher to orchestrate differentiated instruction day after day, hour after hour, by evaluating his/her students and adapting strategies and tactics necessitates sophisticated knowledge and skills.

To use differentiated instruction effectively, a teacher must first understand each of the cognitive factors of the learning process, what they look like when they are working, and what the specific sub-assemblies of

each look like when they are breaking down. Next, a teacher must build a diverse repertoire of strategies and tactics from which to draw the precise strategy or tactic that will address a specific breakdown for a specific task at the right time. Using a great strategy at the wrong time, or mismatching a strategy with a breakdown that will yield no gains, will frustrate students and teachers alike when the strategy fails to produce the desired result.

The learning process has six interactive components: attention, memory, language, processing, and organizing, graphomotor (writing), and higher order thinking (HOT). Not only do these processes interact with one another, but also with emotions, classroom climate, behavior, social skills, teachers, and family.

Teachers need to understand the learning process in general, understand, and respond to students' individual emotional and cognitive profiles, and select instructional strategies and tactics that are effective for diverse learners in order to engage, motivate, and teach all learners at optimal levels.

3.6.1. Attention

The first step in learning anything is to pay attention. Most of us find it easy to pay attention to things that are interesting or exciting to us. Most of us find it difficult to pay attention to things that are not important. When something does not interest us, we are more likely to become distracted, shift to a more stimulating topic or activity, or tune out.

The teacher's job is to design lessons that are relevant to the learner. This can be accomplished by relating what is to be taught to the students' lives. Relate Romeo and Juliet, for example, to the realities of prejudice, unfounded hatred, and gang wars in our communities. Alternatively, connect today's discrimination to Anne Frank's diary and hold class discussions about discrimination that students have personally experienced or witnessed.

Physical activity can help to "wake up" the mind. When a student exhibits signs of inattention and/or restlessness, teachers can provide opportunities for the student to move around. Many students who struggle with attention need to move in order to stay alert. It is prudent to find acceptable, non-harmful ways for these students to participate. Activities such as erasing the board, delivering a message to the office, and collecting papers can provide appropriate outlets for activity.

3.6.2. Memory

Memory is a complex process that employs three systems to assist a person in receiving, using, storing, and retrieving information. The three memory systems are (1) short-term memory (e.g., remembering a phone number from information long enough to dial it), (2) working memory (e.g., keeping the necessary information "files" out on the mind's "desktop" while performing a task such as writing a paragraph or working a long division problem), and (3) long-term memory (a mind's ever expanding file cabinet for important information).

Every day, children in school must remember far more information than most adults. Adults have more specialized days; mechanics use and remember mechanical information, dentists use and remember dental information, and so on. School, on the other hand, expects children to become experts in a variety of subjects, such as math, language, science, social studies, a foreign language, and the arts.

It is critical to remember that just because a student understands something does not mean he will remember it. For example, a person may understand a joke he heard at a party on Saturday night, but he may struggle to remember it when attempting to tell it to his friends on Monday.

Teachers should activate students' prior knowledge and make new information meaningful to them in order to increase the likelihood that all students will elaborate on new information. A teacher, for example, might ask second graders how to divide a pan of brownies evenly among the 20 students in the class, and then connect their solution to the concept of equivalent fractions. Connecting the benefits of dividing candy or cookies evenly among friends to how algebraic equations must be equal or balanced on both sides also connects to prior knowledge.

Students who struggle with both short-term and working memory may require directions to be repeated to them. Giving directions both orally and in writing, as well as providing examples of what is expected, will benefit all students. Self-testing will benefit all students. Students should be asked to identify key information, develop test questions, and then respond to them. This strategy is also effective in cooperative learning groups, and evidence-based research has shown that it improves reading comprehension (NICHD, 2000).

3.6.3. Language

In school, language is the primary means of transmitting and receiving information. There are two types of language processing systems: expressive and receptive. When we speak and write, we use expressive language, and when we read and listen, we use receptive language. Students who have strong language processing skills typically perform well in school. Language issues, on the other hand, can impair a student's ability to communicate effectively, comprehend, and store verbal and written information, comprehend what others say, and maintain relationships with others.

The majority of students, particularly those who struggle with written language, will benefit from using a staging procedure for both expository and creative writing. Students generate ideas first using this procedure. They can then organize their thoughts. They may also look at sentence structure as a third option. They then go over their spelling. Finally, they take care of mechanical and grammatical rules. It is also beneficial for students to keep a notebook of their most frequently occurring errors and refer to this list when self-correcting.

Reading and writing will benefit all students if they are taught in a systematic, cumulative, and explicit manner. Students with receptive language difficulties, such as a slower processing speed, must expend a lot of mental energy to listen and may true easily. As a result, brief, highly structured lectures or group discussions should be interspersed with frequent breaks or quiet periods. Oral instructions may also need to be repeated and/or in writing.

Cooperative Strategic Reading (Klinger et al.; as cited in Marzola, 2006) is another method for engaging students in reading while also improving oral language skills. This strategy is ideal for encouraging intellectual debate and improving reading comprehension of expository text in mixed-level classrooms across disciplines. Students are divided into cooperative learning groups of four to six students of varying abilities when using this strategy. The students collaborate to complete four major tasks: (1) preview (skim through the material to determine what they know and what they want to learn), (2) identify clicks and clunks (clicks = we get it; clunks = we do not understand this concept, idea, or word), (3) get the gist (main idea), and (4) wrap up (summarize important ideas and generate questions) (think of questions the teacher might ask on a test). Each group member is assigned a role, such as leader/involver/taskmaster, clunk expert, gist expert, and timekeeper/pacer (positive interdependence). Each student should be ready

to report on the group's findings (individual accountability). By broadening the way, we communicate information in the classroom, we can connect all students, especially those with language challenges, to the topic at hand. Using visual communication, such as pictures and videos, to reinforce verbal communication is beneficial to all students, but especially to those who struggle with receptive language. Encourage students to come up with new ways to communicate using pictures and other visuals, drama, sculpture, dance, and music, and watch as their memory of key concepts improves and classrooms come to life.

3.6.4. Organization

We process and organize information in two ways: simultaneously (spatially) and sequentially (sequential). Simultaneous processing is the method by which we order or organize data in space. Two examples of simultaneous processing are having a good sense of direction and being able to "see" how puzzle pieces fit together. We use sequential processing to order or organize information in time and sequence. Sequential processing includes concepts such as time, dates, and order-yesterday, today, and tomorrow, months of the year, mathematical procedures such as division and multiplication, word order in sentences, and sentence order in paragraphs. Students who are good at successive organization usually have little or no trouble managing their time and find it easy to organize an essay in a logical sequence.

Students who have difficulty understanding spatial or geographical problems may require multiple verbal explanations. Writing written explanations and descriptions of the information contained in charts, graphs, or diagrams may be beneficial to them. This process should be modeled by teachers for all students.

Students who struggle to remember sequences of information but excel at simultaneous processing should use graphic organizers and create diagrams or flow charts of sequential information such as historical events rather than the standard timeline. They could benefit from software programs like Inspiration, which organize concepts and information into visual maps.

Cooperative learning allows each student's processing and organizing abilities to be used for the benefit of the group. Those who are strong in simultaneous organization, for example, may create the group's chart, visual, or map, whereas those who are strong in successive organization may be task step organizers, taskmasters, timekeepers, and pace setters.

3.6.5. Graphomotor

To produce written work, the writing process necessitates neural, visual, and muscular coordination. It is not a willful act, but rather a coordinated effort among those functions. Often, the student who appears unmotivated to complete written work is the student with clumsy writing coordination. We've long accepted that students can range from very athletic to clumsy when it comes to sports, but we did not realize until recently that some students write "athletes" while others write "klutzes." Just as practice, practice, practice will not turn a klutz into a football all-star, practice, and acts of will not turn a klutz into a writing all-star if her neurological wiring does not allow her to be a high performing graphomotor athlete.

Students who struggle with handwriting may benefit from the opportunity to provide oral responses to exercises, quizzes, and tests. The presence of computers for all children helps to level the playing field for the graphomotor klutz. However, parents, and teachers should be aware that many children with graphomotor difficulties may also struggle with the quick muscular coordination required by the keyboard.

3.6.6. Higher Order Thinking (HOT)

Higher order thinking (HOT) is more than just memorizing facts or relating information in the exact words used by the teacher or book. HOT necessitates doing something with the facts. We must understand and manipulate information.

Concept formation, concept connection, problem solving, grasping the "big picture," visualizing, creativity, questioning, inferring, creative, analytical, and practical thinking, and metacognition are all aspects of HOT. Thinking about thinking, knowing about knowing, and understanding how you think, process information, and learn are all examples of metacognition.

Advance organizers that connect the big picture and the main concepts to be covered will benefit all students. Furthermore, all students should be explicitly taught how to create concept maps (graphic organizers that connect all components of a concept, and may also connect one concept to another concept).

Provide project and exam options that include analytical, practical, and creative thinking. For example, an analytical choice could be to compare and contrast Holocaust events with events in Rwanda. A practical option would be to demonstrate how we can apply the Holocaust's lessons to how

we treat one another in our schools. Writing a play about tolerance, creating a dance that communicates the emotions of the Holocaust, or writing a poem or painting a picture that tells a story about how you feel about the conditions in Darfur are all creative options.

Providing ample opportunities for self-evaluation and self-reflection in the classroom aids students in developing self-understanding. A student who has metacognition can answer the question, "How smart am I?" Thinking about thinking is the first step in metacognition. Metacognition means that a person understands how he thinks and his own strengths and weaknesses in specific skill areas, subjects, and activities.

A person who has metacognition monitors and controls how he learns. He can take on a task and decide how to best complete it by utilizing his strategies and skills. He understands how he would learn a new math procedure and the strategies he would employ to comprehend and remember a science concept. He understands the best way for him to organize an essay-whether an outline, a graphic organizer, or a mind map would be more effective. He has mental self-control.

Psychologist Robert Sternberg lists six components of mental self-management:

- Know your strengths and weaknesses;
- Capitalize on your strengths and compensate for your weaknesses;
- Defy negative expectations;
- Believe in yourself (self-efficacy);
- Seek out role models; and
- Seek out an environment where you can make a difference.

Finally, we hope that students who attend the schools will be in this position when they graduate. As adults, we should model our own metacognition, discuss metacognition, and provide meaningful examples of metacognition on a regular and consistent basis.

Then, teaching students about the six components of the learning process-attention, memory, language, processing, and organizing, graphomotor (writing), and HOT-demystifies learning and allows them to improve their metacognition. It also improves their self-esteem. A student who understands that she may need to use a specific strategy to improve her working memory function or that taking frequent breaks will help her stay more focused on her homework assignments is far better off than one who believes she is stupid or lazy.

3.6.6.1. Emotions

Emotions control the learning on/off switch. Our learning processes are activated when we are relaxed and calm. When we are tense, anxious, or afraid, our learning processes flash red. Tension slams the steel door of the mind shut in the classroom. Creating a nonthreatening classroom environment or climate in which mistakes are welcomed as learning opportunities decreases tension, opens the mind, and increases learning opportunities.

The more teachers understand about how learning occurs-how information is processed, manipulated, and created-the more we will understand about what it looks like when it is working and when it begins to break down. Rather than assuming that a student is unmotivated, teachers will examine whether it is attention, memory, language, organizing, graphomotor, or HOT that requires intervention.

3.6.6.2. Motivation

It is every teacher's responsibility to motivate every student. Learning more about the brain and the development of the mind, studying new information on learning, making learning meaningful and learning about learning, watching the learning process, closely monitoring for breakdowns, and celebrating every student's successes-these are our challenges as we create schools that honor diversity-schools that all children deserve.

3.7. PRINCIPLES OF LEARNING

Learning principles are suggestions for the most effective ways for people to learn. The more these principles are included into training, the more effective training will be. These are the fundamental concepts or situations that promote learning. Learning is defined as a change in behavior that occurs as a result of experience. All living is learning.

Learning is defined as a generally permanent change in behavior potentiality that occurs as a result of reinforced practice or experience.

Five principles of learning are:

- Participation;
- Repetition;
- Relevance;
- Transference; and
- Feedback.

3.7.1. Participation

The learner's active participation should be permitted and encouraged during the learning process. Participation boosts motivation and appears to engage more senses, which reinforces the learning process. People learn faster and retain their knowledge longer as a result of participation.

Most people, for example, never forget how to ride a bicycle since they actively participated in the learning process. The learning process should be experiential rather than merely informational.

As a result, trainers should arrange the physical environment to encourage small group interaction and the sharing of ideas.

3.7.2. Repetition

An important principle of learning is to give the learner the opportunity for practice and repetition. To reap the full benefits of training, learned behaviors must be overlearned to ensure smooth performance and minimal forgetting at a later date. Individuals' abilities to learn and retain new skills improve when they visualize themselves performing the new behavior.

3.7.3. Relevance

Learning is aided when the content to be learned is meaningful. Learning should really be problem-centered rather than content-centered. Learners are driven to learn when training is immediately applicable to assisting them in solving a current problem. Learning something just because someone says it is "important" is not as motivating.

3.7.4. Transference

Because the training takes place in a unique setting, an important question to consider is whether the knowledge will transfer to the actual job situation.

Transfer of training occurs when trainees can apply what they have learned in a training course to their jobs. If what is learned in one setting does not transfer to the actual job situation, the training is considered a failure.

There are three possible training situations for transfers:

- Positive transfer of training occurs when training activities improve performance in a new situation;

- Negative transfer of training occurs when training activities impair performance in a new situation.
- No observable effect of training.

3.7.5. Feedback

Feedback provides learners with information about their progress. Performance feedback is a necessary condition for learning. Feedback improves performance not only by assisting learners in correcting their mistakes, but also by providing reinforcement for learning. The knowledge of results is a form of positive reinforcement in and of itself. When feedback is available, learning activities have a higher intrinsic interest. Nonetheless, performance feedback should do more than just tell learners whether they were correct or incorrect.

Simply informing the trainees that they were wrong is not as effective as explaining why they were wrong and how they can avoid making mistakes in the future. In general, knowledge of results is an important aspect of learning, and this knowledge comes after the learner's response.

3.8. DIFFERENCE BETWEEN TEACHING AND LEARNING

We have been taught a variety of things throughout our lives, beginning with our families. They say that your parents are your first teachers, followed by our school teachers. Teaching entails assisting a person or a student in acquiring knowledge, competence, or virtue. A teacher does not need to be in a school to teach someone because teachers can be found anywhere.

Similarly, learning is another aspect of teaching in our lives. If someone is teaching, it is the students who are learning. In other words, learning is a process that contains acquiring knowledge and understanding. Learning entails developing values, skills, preferences, and other characteristics.

3.8.1. Teaching vs. Learning

Teaching is the process of assisting someone or a student in acquiring knowledge, competence, or virtue. A teacher does not need to be in a school to teach someone; teachers can be found anywhere.

Similarly, learning is another aspect of teaching that we encounter in our daily lives. If someone is teaching, it is the students who are learning from

that teacher. In other words, learning is the process of acquiring knowledge and understanding. Learning entails acquiring values, skills, preferences, and many other things. The distinction between teaching and learning is that teaching entails imparting knowledge while learning entails acquiring that knowledge. This is the distinction that distinguishes the two words. (Table 3.5).

Table 3.5. Comparison between Teaching and Learning

Parameters of Comparison	**Teaching**	**Learning**
Definition	Teaching is the process that involves sharing knowledge with the other person.	Learning means acquiring knowledge from your teacher like values, skills, behavior, etc.
Forms	Teaching comes in two forms: formal and informal	Whereas learning does not have any form. One can learn a lesson from everything.
Continuous Process	Teaching is a continuous process as it requires a lot of time to teach a new thing to someone who does not have any idea regarding that particular thing.	Learning too is a continuous process. Not everybody is smart or robots that can learn everything in one day.
Consciousness	People can teach one another consciously or even unconsciously	Learning also happens sometimes consciously and unconsciously.
Linked With	It is linked with learning and learners.	Sometimes learning does not need to be taught.
Authority	Teaching mostly happens with higher authority.	Whereas learning happens with the lower authority only.
Autonomous	Teaching is more autonomous	Learning is less autonomous.

3.8.1.1. What Is Teaching?

Spreading knowledge to others is what teaching entails. Teaching can take place both formally and informally. When we hear the word “teach,” we immediately think of a teacher, and it is true that a teacher is the person who teaches us for the majority of our lives. For most people, education began in

school, and your teachers were your sole source of information; you learned something today.

Because there are values and morals, behavior, discipline, skills, manners, and traditions that can be taught to one another, teaching may not include knowledge. When we talk about unofficial teaching, all of these things come into play, whereas when we talk about official teaching, mostly bookish knowledge is taught.

As previously stated, teaching does not imply that a teacher teaches in a school or a university. Teaching starts the moment you are born, and your parents are your first teachers. Your parents are the ones who teach you about life values, behavior, and other such things. This is where your behavior is reflected, and it reveals information about your family background.

Professionals in the field of education are responsible for teaching in a school setting. The teaching in schools and colleges is structured, and the educators have their own schedules, routines, and timetables. The traditional method of teaching entails a teacher lecturing to his or her students, while the students take notes on what the teacher has said to them.

3.8.1.2. What Is Learning?

To put it simply, learning is the acquisition of knowledge. Knowledge does not always imply education because there are numerous other things that can be learned in life. Because learning is an ongoing process, we continue to learn throughout our lives. Where there is a wealth of knowledge, one must continue to learn throughout one's life.

Learning begins the moment we are born. As we develop from infant to child, we learn to do a variety of activities such as eating, walking, talking, and so on. As we grow, we acquire a variety of skills.

Learning can be accomplished in a variety of ways and styles. Visual learning, listen, and learn, and kinesthetic learning are a few examples. Visual learning is the process of learning something by looking at it and seeing it. Assume you have a pie chart diagram in front of you that displays the most recent data on your country's crime rate. Then you look at the diagram and notice that some states have a higher crime rate than others. Learning, on the other hand, comes to an end after death, whereas teaching continues even after death.

3.8.1.3. The Primary Distinctions Between Teaching and Learning

1. The distinction between teaching and learning is that teaching is done to impart or disseminate knowledge or skills to a group of learners, whereas learning is done to gain knowledge and skills from a teacher or a professional.
2. Teaching necessitates high-level authority, whereas learning necessitates low-level authority.
3. Expert knowledge in a specific field is required for teachers or those who teach something to a group of learners.
4. Teaching is always associated with a group of learners, whereas learning does not necessitate teaching.
5. Learning and teaching can be done consciously or unconsciously.
6. Where a person's legacy lives, teaching continues even after death, whereas learning ceases after death.

Conclusively, we would say that teaching and learning cannot happen without one another. There are only a few people can teach something in a proper way because either they lack the knowledge or they fail to teach adequately.

Learning on the other hand, is something which is better than teaching because if you have the willingness to learn something new then you can do it on your own. Nowadays, one can learn something new even from the internet without the help of a teacher.

Chapter 4

Micro-Teaching

CONTENTS

4.1. Introduction 108
4.2. Meaning of Micro-Teaching 108
4.3. Definition and Basic Concepts 110
4.4. Procedure of Micro-Teaching 112
4.5. Micro-Teaching Phases 114
4.6. Steps and Requirements of Micro-Teaching 115
4.7. Key Strengths of Micro-Teaching 118
4.8. Some Characteristics of Micro-Teaching 121
4.9. Underlying Principles of Micro-Teaching 122
4.10. Merits and Demerits of Micro-Teaching 124

4.1. INTRODUCTION

The art of teaching does not simply include a simple transfer of knowledge from one to other. However, it is a complex process that both helps and influences the learning process. The effectiveness of a teacher is measured by how much his or her students understand from his or her instruction. Classrooms cannot be used as a learning environment for developing core teaching skills. In medical education programs, training medical teachers in specific teaching abilities is a key difficulty. Only through more systematic and less expensive faculty training procedures can pedagogic skill for teaching be achieved. With the emergence of micro-teaching roughly five decades ago, the lack of scientifically proved or successful approaches to be used in teacher education programs was filled.

Micro-teaching, an effective teacher training tool, allows teachers to improve their teaching skills. Micro-teaching, with its proven success among novices and seniors, aids in the promotion of real-time teaching experiences. The key skills of micro-teaching, such as presentation and reinforcement, assist rookie teachers in learning the art of teaching with ease and to the greatest extent possible. This technique's impact has been widely witnessed in numerous forms of education such as health sciences, life sciences, and other disciplines. The purpose of this chapter is to underline the need of employing micro-teaching approaches more frequently and efficiently with limited resources.

4.2. MEANING OF MICRO-TEACHING

Micro-teaching is an acceptable novel strategy for assisting student teachers being trained in educational colleges in acquiring the desired teaching skills. Micro-teaching can be defined as a type of specialized training technique that gives appropriate opportunity for pupil teachers to practice and develop certain teaching skills by organizing teaching in its micro form-miniature in terms of class size, time duration, and subject to be covered (Figure 4.1).

Figure 4.1. Micro-teaching is a mechanism for training inexperienced or experienced teachers in the art of teaching by practicing certain skills through "scaled down teaching encounters," i.e., minimizing the difficulties of real typical teaching in terms of class size, duration, and material.

Source: https://cdn.slidesharecdn.com/ss_thumbnails/nafeesath-170213102314-thumbnail-4.jpg?cb=1486981512.

- Independence from practicing schools and their students for skill practice;
- Allowing for the practice of one teaching skill at a time;
- Lowering the complications of traditional classroom teaching;
- Offering suitable opportunity for systematic observation of teaching and rapid feedback in order to improve one's teaching ability;
- Offering opportunities for teacher trainees to strengthen their teaching skills in laboratory-like controlled environments.

Our teacher's micro-teaching approach for practicing teaching skills micro-teaching is a technique that allows teacher candidates to practice a skill by teaching a short session to a small group of students. A micro lesson of 5 to 10 minutes is usually taught to four or five other students. A supervisor normally grades the class using an appraisal guide and then discusses it with the teacher trainee; however, if closed circuit television (CCTV) is available, the appraisal guide may be obsolete. If necessary, the teacher trainee will modify his or her approach and re-teach the subject to a different group of students.

4.3. DEFINITION AND BASIC CONCEPTS

Microteaching is an efficient teacher training technique that plays a pivotal role to enhance the teaching skills of pre-service teachers. It is a technique aiming to prepare teacher candidates for the real classroom setting (Brent & Thomson, 1996; Uzun, 2012).

It is considered an innovative approach to pre-service teacher education training since its initial introduction in the early 1960s (Ostrosky et al., 2013).

According to Amobi (2005), microteaching is a technique employed to train pre-service teachers to master specific skills in a teacher education program.

Similarly Uzun (2012) describes it as a teaching technique especially used for teacher trainees to train them systematically by allowing them to experiment important teacher behaviors.

Ananthakrishnan (1993) defines it as: A vehicle of continuous training process applicable at all stages not only to teachers at the onset of their career but also for more senior teachers who are already in the teaching field (p. 143).

In many teacher education programs, the use of microteaching has expanded from its original focus of helping preservice teachers to master discrete teaching skills, to giving them the complete teaching experience (Amobi, 2005).

Through the microteaching experience, both preservice and in-service teachers rectify specific errors and progress in their ways of teaching.

4.3.1. Efficient Technique and Effective Teaching

Micro-teaching can be carried out using a brief lesson or a single subject and a small group of pupils. It simplifies the difficulties of practical teaching by allowing for rapid feedback following each practice session. Multimedia equipment, such as audio-video recording devices, plays a critical part in the educational process.

Observing another teacher and conducting trial-and-error sessions in one's own teaching sessions are extremely popular methods of self-training. However, each of them has its own drawbacks. Micro-teaching, on the other hand, assists novice and experienced teachers in removing errors and developing stronger teaching skills. Micro-teaching builds self-confidence, enhances in-class teaching effectiveness, and helps students develop classroom management skills.

4.3.2. Significance of Micro-Teaching

Micro-teaching is an excellent method for developing teaching skills in pre-service instructors. With a track record of success among pre-service and in-service teachers, it contributes to the promotion of real-world teaching experiences (Remesh, 2013). It focuses on honing, strengthening, and boosting the confidence of learner-teachers. Teacher candidates experiment and learn teaching abilities through micro-teaching practice by breaking them down into smaller portions and different components (Uzun, 2012). Micro-teaching's basic competencies, such as presentation and reinforcement, assist pre-service teachers in maximizing their teaching abilities. He and Yan (2010) recommended micro-teaching as an effective method for pre-service teachers' professional growth in their study on the authenticity of micro-teaching in pre-service teacher education programs. Fernandez (2012) stated in his study titled 'Learning through micro-teaching Lesson Study in Teacher Preparation' that micro-teaching is an effective strategy for pre-service teachers to improve their teaching skills. The study examined micro-teaching lesson studies (MLS); an experience built on the success of a previous Japanese lesson study. A qualitative investigation of multiple data sources revealed that the education and perceptions of 36 potential teachers were quite valuable. Apart from giving teaching experience, the MLS enabled students to improve their grasp of reform-oriented teaching and topic knowledge through peer participation and instructor feedback. Feedback was found to be critical in developing the teacher candidates' overall teaching competency.

4.3.3. The Role of Feedback in Micro-Teaching

Micro-teaching enables professional supervision to provide constructive criticism (Ananthakrishnan, 1993), and the feedback supplied is critical in developing pre-service teachers' skill by allowing them to pursue a reflective teaching experience. Micro-teaching and feedback assist educators in becoming more effective teachers (Re, 2008). Micro-teaching simplifies the difficulties of real teaching by allowing for rapid feedback following each practice session (Remesh, 2013). These opportunities for feedback enable them to reflect on their strengths and address their weaknesses, so improving their overall teaching abilities. Additionally, this methodical process enables them to explore and reflect on their own and others' teaching methods, while also exposing them to new teaching techniques (Wahba, 1999). While such practice helps establish teaching skills in pre-service instructors, the

reciprocal negotiation between students actively presenting and observing performances contributes significantly to their acquisition (Figure 4.2) (Taşdemir, 2006; Uzun, 2012).

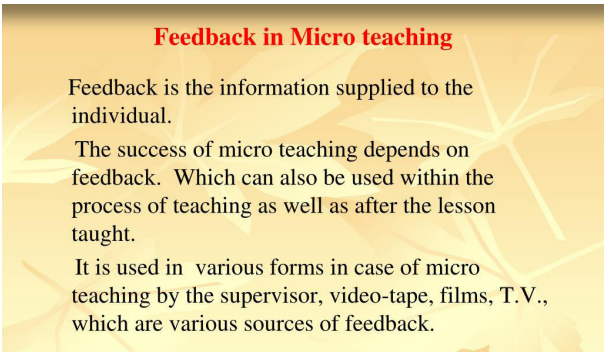

Figure 4.2. Role of feedback in micro-teaching.

Source: https://image.slideserve.com/702396/feedback-in-micro-teaching-l.jpg.

4.4. PROCEDURE OF MICRO-TEACHING

1. **Skill Definition:** The pupil-teacher or the supervisor defines a certain skill. Micro-teaching skills are characterized in terms of the teaching behavior used to acquire knowledge of the required abilities on which they must concentrate.
2. **Demonstration:** The second step in the procedure is the demonstration. Experts teach the specific talent to the teacher trainee either directly or via audio video tape recordings. This provides teachers with direction on how to proceed.
3. **Lesson Planning:** This is the student-initial teacher's action. The trainee teacher designs a brief session in which to practice the skill. This lesson plan for micro-teaching is created with the assistance of his supervisor.
4. **Conducting the Lesson:** Once the session is organized, the pupil-teacher instructs the group of pupils on the desired skill. Supervisors and pupil instructors monitor these lessons.

   Additionally, they are recorded, audiotaped, or broadcast live via a CCTV camera. Later on, these tapes are used for self-evaluation.

5. **Discussion and Conclusion:** After the teaching session concludes, a finishing session is held. The last session is comprised of supervisor input.

   During this session, the audio or video recording may be displayed to allow for self-evaluation. Additionally, it enhances the trainee's confidence. It is the most effective method of motivating the trainee to perform better the next time.

6. **Re-Planning:** Developing a skill requires continuous effort. Thus, once the micro-teaching cycle is completed, the process is repeated. This repetition necessitates a rewrite of the instructional plan. The purpose of this reorganization is to master the previously described skill.

7. **Re-Teaching:** After the lesson has been redesigned, it is taught to another group of students from the same class. The duration of the class is maintained at the same level as the prior class. This strategy assists in repeatedly practicing the skill.

8. **Re-Discussion:** The discussion and conclusion steps are repeated at the completion of the re-teaching session. These talks and ideas help the learner perform better. Thus, the feedback process is facilitated in order to further improve performance.

9. **Redoing:** After the end of every session, this cycle is repeated. The repetition process is repeated until the necessary skill is mastered. This approach is repeated until all essential skills are acquired (Figure 4.3).

Thus, micro-teaching entails the four R's: Replanning, Re-teaching, Re-discussing, and Redoing.

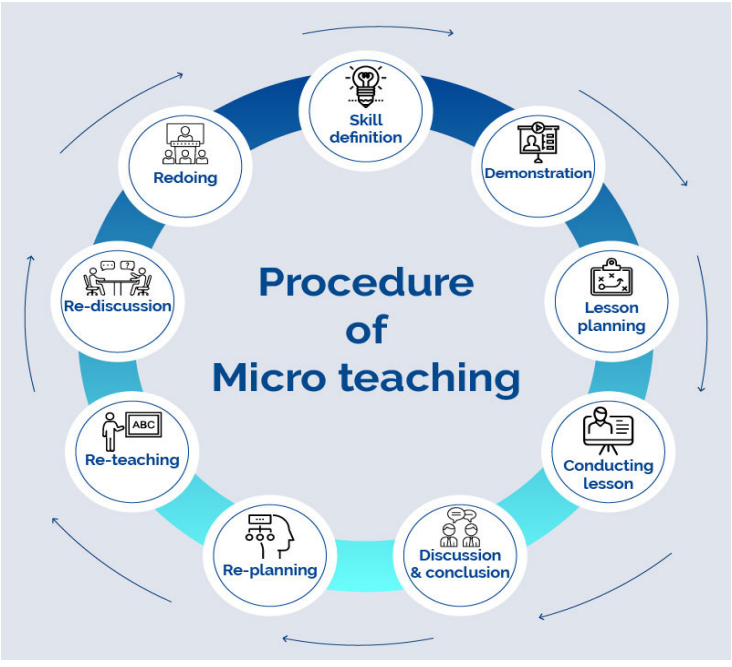

Figure 4.3. Procedure of micro-teaching.

Source: https://content.wisestep.com/wp-content/uploads/2016/06/Micro-teaching-procedure.jpg.

4.5. MICRO-TEACHING PHASES

1. **Knowledge Acquisition:** This is the beginning of the micro-teaching process. It entails data collection. The trainee teacher gets knowledge about the required abilities throughout this period by reading various books and watching various showcasing videos.

   Additionally, this phase incorporates a rational comprehension of essential skills as a classroom component.

2. **Skill Acquisition:** This is the phase in which the micro-teaching program is put into action. This phase requires the trainee teacher to plan classes and practice skills using the model offered at the beginning.

   The two critical components of micro-teaching in this instance are feedback and setting. The lesson's duration, the class's

duration, the skill to be acquired, the supervisor, and the students all contribute to the setting.

3. **The Transferring Phase:** This is the final and most important stage of micro-teaching. Here, the learner is exposed to an uncontrolled setting.

Here, both teachers and students have an opportunity to learn and improve. Unlike the other stages of micro-teaching, this takes place in a real classroom (Figure 4.4).

Figure 4.4. Phases of micro-teaching.

Source: https://content.wisestep.com/wp-content/uploads/2016/06/Micro-teaching-phases-300x300.jpg.

4.6. STEPS AND REQUIREMENTS OF MICRO-TEACHING

Micro-teaching consists of three distinct phases: knowledge acquisition, skill acquisition, and transfer. The phases of micro-teaching are depicted in Figure 4.5. The knowledge acquisition phase is the preliminary, pre-active phase during which the teacher is instructed in the teaching skills and components through lectures, discussion, illustration, and demonstration of the skill by specialists. The teacher develops a micro-lesson for practicing the presented skills during the interactive, skill acquisition phase. Colleagues and peers can serve as constructive evaluators, allowing them to make adjustments to

their own teaching-earning techniques. The instructor can reinforce required behaviors and skills and eliminate those that are superfluous. Finally, they will be able to combine and adapt their newly acquired skills from simulated teaching situations to actual classroom instruction. The 10 critical steps of a micro-teaching activity are depicted in Figure 4.6.

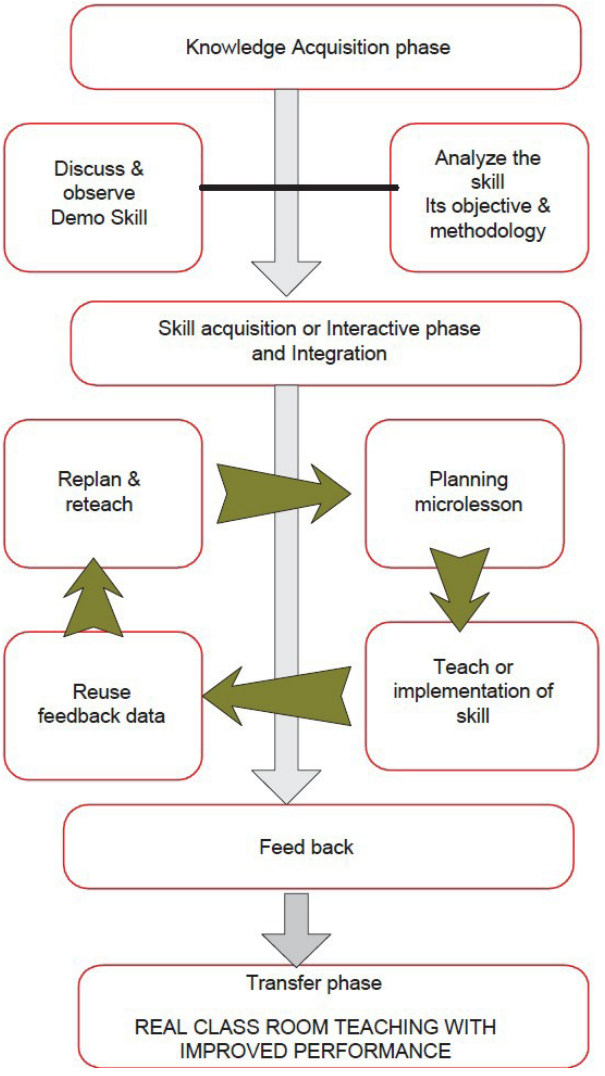

Figure 4.5. Various phases involved in a micro-teaching activity.

Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3724377/figure/F1/?report=objectonly.

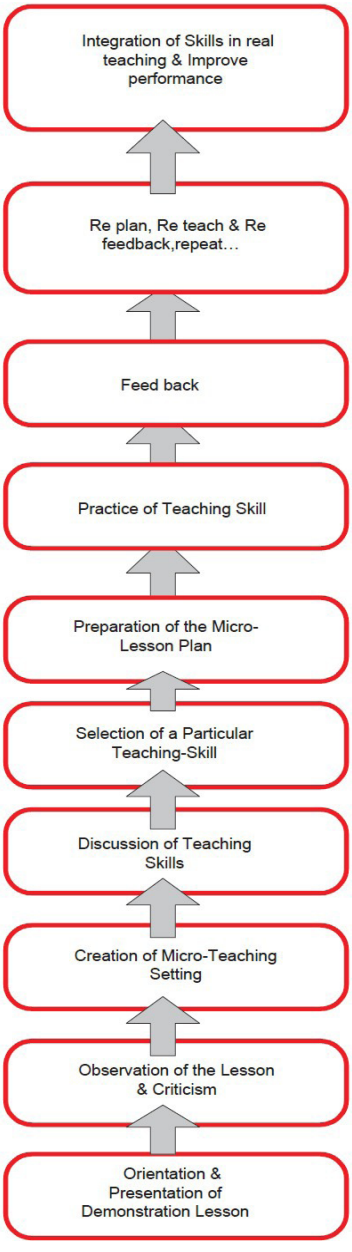

Figure 4.6. Teaching ladder-10 steps to make effective teaching.

Source: https://www.researchgate.net/figure/Teaching-ladder-10-steps-to-make-effective-teaching_fig2_255178973.

After gaining a firm grasp of the principles and components of each core teaching skill, the participant should develop a micro-lesson for each core teaching skill and sequentially implement one skill in each micro-teaching session. On a weekly or monthly basis, the setting can be done in the department itself with minimum facilities. Adequate and relevant constructive feedback for each skill might motivate the skill's re-teaching and re-application. The feedback data may be reused, and all of the essential teaching techniques can be combined into a macro lesson and eventually into actual classroom instruction or medical education programs. The entire faculty serves as both a mentor and a constructive evaluator. This also enhances the teacher's evaluative abilities. While there is a possibility of not offering enough feedback during the early sessions, the skillful capacity to analyze and deliver constructive feedback improves as the number of sessions increases.

4.7. KEY STRENGTHS OF MICRO-TEACHING

Micro-teaching's primary strength has been its ability to provide a supportive environment in which beginning teachers can practice their instructional skills in manageable chunks, receive feedback on their performance, reflect on that feedback, and then use that information to improve their teaching (Benton, 2001; Wilkins, Shin, and Ainsworth, 2009). Although micro-teaching was invented, implemented, and investigated initially in teacher education (Merglera and Tangen, 2010; Richards and Farrell, 2011), it was quickly adopted by other disciplinary sectors (Ananthakrishnan, 1993; Sana, 2007).

Educators in these professions used it similarly as an educational tool to assist their individual cohorts of novice practitioners in acquiring/refining and reflecting on their distinct sets of professional knowledge and abilities, as well as in evaluating their own and their peers' performance (Amobi and Irwin, 2009).

4.7.1. In the Field of Teacher Education

Micro-teaching's prominence in teacher education increased in the 1960s, owing to the success of the Sanford experiment (Clifford and Edwards, 1975), becoming a critical component of many teachers' preparation programs until the 1990s, when its presence diminished (Grossman, 2005). This decline in popularity corresponded to the evolution of educational trends in terms of theoretical and philosophical foundations (Parkay, Anctil,

and Hass, 2014). Micro-teaching originated during a period when more conservative, traditional, and positivistic views predominated (Ornstein and Hunkins, 2013).

At the time, behavioral psychology and empirical/quantitative research on product processes were popular, and interest in the teaching-effectiveness movement grew (Grossman, 2005). However, in the late 1970s, a trend toward more contemporary, liberal, and existential perspectives emerged (McMillan, 2012); and this progressivist/reconstructionist perspective was bolstered by cognitive-developmental psychology's tenets and the proliferation of educational practices emphasizing social-constructivist learning and research (Leedy and Ellis, 2013, p. 139; Ornstein and Hunkins, 2013, pp. 110, 111). As a result, the usage of micro-teaching in teacher education has decreased, with some studies casting doubt on its efficacy, impact, and out-of-date theoretical foundations (Kallenbach and Gall, 1969; Macleod, 1987). Despite these criticisms, micro-teaching did not vanish entirely (Jobling and Moni, 2004; Turner, 2003). For instance, studies on training teachers of second languages (L2) found that various forms of micro-teaching provided an invaluable form of simulated instructional practice in programs for L2 teacher candidates (Wilbur, 2007). Micro-teaching quickly gained international attention and was embraced by teacher educators in Europe and Africa (Aydin, 2013; Klinzing and Floden, 1991). Because some European and African institutions believed the initial American model was too narrowly focused on technical skills, they expanded the micro-teaching procedure to include a broader range of teacher functions such as cognition, creative thinking, decision-making, and professional responsibility (Klinzing and Floden, p. 34). Additionally, micro-teaching and its derivatives have gained popularity in various domains of professional education (Remesh, 2013; Tochon, 2008).

4.7.2. In Related Disciplines

Micro-teaching was used by educators in different disciplines to improve the instructional and communicative skills of students enrolled in their respective programs (Gelula and Yudkowsky, 2002). Additionally, some of these fields adapted the techniques used to implement the process, such that some programs emphasized peer- and mentor-feedback without videotaping (Napoles, 2008; Ralph, 1995); others emphasized the video-playback component (Fowler, 1993; King, 2008; Ralph, 1996a); and still others avoided the process's name but retained specific practices, such as using video technology to provide learner feedback (Fukkink, Trienekens, and

Kramer, 2011; Reynolds, 2013; Ralph, 1996b). Sana (2007), for example, claimed that micro-teaching was significant in assisting medical students in developing their medical teaching talents. Perrott (1976) demonstrated how micro-teaching might be used to assist medical educators in honing their instructional abilities. Faulkner, Argent, Jones, and O'Keeffe (1995) explored employing micro-teaching components to assist physicians in improving how they communicated distressing information to patients.

Micro-teaching has been shown to be beneficial in dentistry professional education in recent research from India. According to one study, the majority of instructional employees stated a wish to see modifications in the traditional chalkboard lecture style used in medical school (Sharma, Khan, Muzzammil, and Ahmad, 2013). The educators suggested expanding the use of micro-teaching, multimedia, and video-learning, as well as increasing the amount of student input in workshop and seminar settings. A second report called for the use of micro-teaching as a targeted pedagogical strategy for polishing dental faculty members' emotional intelligence, presenting skills, and interpersonal skills—by requiring them to participate in the teach, critique, reteach cycle that micro-teaching provides (Kamboj, George, and Jha, 2010). According to these studies, participants would benefit from immediate feedback and the application of positive teaching strategies and ideals.

Micro-teaching was also found to be beneficial in developing participants' self-learning and self-regulation processes in another study involving medical students in Spain (Campos-Sánchez et al., 2013). Micro-teaching, or portions thereof, was also used by nursing educators to assist student nurses in developing their communication and interviewing skills and to enhance nursing instructors' instructional competence (Noordman, van der Weijden, and van Dulmen, 2013). Two studies in pharmacy education found that instructors saw micro-teaching as a critical component of growing pharmacy students' performance competencies and of increasing pharmacy professionals' communication skills (Popovich and Katz, 2009; Diks-Hit, 2007). Other disciplines that have used micro-teaching to enhance instructional and/or communication proficiency among pre-service undergraduates and in-service graduates include the following: (a) geriatric care (Allen and Belzer, 1997; Roush, 2008); (b) athletics/sports coaching (Reynolds, 2013); (c) psychological counselling (Elsenrath, Coker, and Martinson, 1972); and (d) dietetic advising (Fiedler and Beach, 2008; Ghafoor, Kiani, Kayani, and Kayani, 2012).

4.8. SOME CHARACTERISTICS OF MICRO-TEACHING

- Micro-teaching enables the trainee to focus entirely on learning a single, well-defined skill.
- Micro-teaching enables immediate feedback to be pinpointed.
- Because micro-teaching is a scaled-down version of traditional education, there is no issue with discipline.
- Administrative issues are minimized when teaching sessions are organized collaboratively.
- Micro-teaching enables researchers to conduct investigations under more controlled conditions and circumstances.
- Micro-teaching can be incorporated into teacher education, as sophisticated technology is not required.

The steps in a micro-teaching session are:

1. **Planning:** This entails identifying the skill to be practiced, being aware of its components, selecting an appropriate topic, and composing a micro lesson with defined objectives.
2. **Teaching:** The micro-teaching technique is best used in the following environment.

- Time: 5 minutes;
- Students: Peer group-5 or so in number;
- Supervisors: 1 or 2.

If possible, use of CCTV might be utilized to provide the teacher trainee with an up-close view of his deficiencies.

3. **Feedback:** A critical component of the micro-teaching cycle is feedback. It must be clearly tied to the model of the teaching skill being utilized in order to be effective. Appraisal guides supplement supervisor and peer student comments; they focus feedback on specific behaviors and can be used during the analysis session or simply handed to the teacher trainee with a written comment or grade of his or her skill performance.
4. **Replan:** Using the supervisor's criticism, the teacher trainee replans his or her micro lesson, either by creating a new one or altering an old one.

5. **Reteach:** The teacher trainee reteaches with the same students or another set of five students, including the suggested adjustments. Supervisors monitor skill attainment to determine if there has been any improvement.
6. **Re-Feed Back:** The supervisor evaluates the lesson once more, highlighting any improvements or lapses (Figure 4.7).

Figure 4.7. Steps in a micro-teaching cycle.

Source: https://th.bing.com/th/id/R.23ff4eef39d536cba152a8976b6c734e?rik=R4XjGeMqifji1A&riu=http%3a%2f%2fimage.slidesharecdn.com%2fintroductiontomicroteaching-120819103809-phpapp01%2f95%2fintroduction-to-micro-teaching-12-728.jpg%3fcb%3d1345374352&ehk=WRsP%2b%2f156oOI%2bGQw0gE2MoUz2zHNNpsxSw6I4A4gD3s%3d&risl=&pid=ImgRaw&r=0.

4.9. UNDERLYING PRINCIPLES OF MICRO-TEACHING

Micro-teaching is based on particular concepts in order to maximize its impact on the overall development of teachers:

1. **One Skill at a Time:** Micro-teaching focuses on one skill at a time. Training on specific abilities is provided until they are mastered. Once a talent is mastered, another is targeted. As a result, micro-teaching focuses on a single skill at a time.

2. **Concise Content:** It provides trainees with more freedom and convenience. Thus, micro-teaching is predicated on the concept of constrained material. Teachers are expected to plan their classes around the provided content; this makes it easier for them to perform their lessons.
3. **Practice Makes a Man Perfect:** Skill mastery necessitates practice. While micro-teaching focuses on a single skill at a time, it also provides an opportunity to practice those skills. Numerous practice sessions can help build confidence and aid in the development of teaching skills.
4. **Experiments:** These are critical to the development of any notion. Numerous experiments are undertaken in micro-teaching to evaluate the teachers' abilities.

For instance, supervisors run experiments in which the length of lessons, the quantity of time spent in class, and the strength of students in the class are varied. These abilities are evaluated in a controlled environment.

5. **Instantaneous Feedback:** Micro-teaching entails the teacher acting as a pupil and the supervisor acting as a student. Following the conclusion of a session, the teacher-pupil and supervisors provide feedback. This feedback is provided immediately following the conclusion of the lesson plan. As a result, it aids in resolving flaws.
6. **Possibilities for Self-Evaluation:** Evaluation is critical in every task. Supervisors administer a variety of exams during micro-teaching, providing numerous opportunities to analyze errors. Evaluation enables you to comprehend and correct a mistake. This program includes a session in which flaws are identified and solutions proposed. As a result, general improvement becomes a more attainable goal.
7. **Continuous Efforts:** Acquiring and mastering skills is a slow and ongoing process. Even after mastering a previous skill, one should aim for continued improvement. Consistent efforts facilitate overall development.

4.10. MERITS AND DEMERITS OF MICRO-TEACHING

4.10.1. Merits of Micro-Teaching

Micro-teaching has a number of benefits. It is geared toward honing and improving specialized teaching abilities, as well as eradicating faults. It enables comprehension of critical classroom behaviors. It boosts the learner teacher's confidence. It is a vehicle for continuing professional development that is applicable at all phases of a teacher's career, not just too new teachers but also to more senior instructors. It allows for the projection of model teaching abilities. It gives expert supervision and positive comments, but most importantly, it enables repeated practice without causing harm to either the teacher or his students.

4.10.2. Demerits of Micro-Teaching

- It fails to give teachers with the essential training to teach in a traditional classroom setting;
- A small class size does not arouse enthusiasm in teaching;
- It has a narrow scope of application;
- They necessitate additional planning time;
- At times, it can be challenging for the teacher to break a large topic into smaller parts;
- Frequently, it poses administrative complications;
- It has a detrimental effect on the classroom climate;
- This is a fabricated circumstance;
- It necessitates a greater degree of critical thinking on the part of supervisors;
- It necessitates astute supervisors.

Micro-teaching is an extremely effective method of honing one's teaching abilities. However, this technique has not been widely adopted because it is challenging to get the necessary resources and organize the time commitments of all participants, particularly in an in-service setting. However, the participants recognize its utility.

To make micro-teaching a viable format, we must solve these fundamental challenges. This may presumably be accomplished by eliminating the requirement for participants to sit in a single location at the same time. Videotaping teaching sessions for peer and self-review is a very effective method of generating feedback. This is widely recognized as the most successful component of micro-teaching.

Chapter 5

Use of ICT in Education

CONTENTS

5.1. Introduction 128
5.2. Significance of ICT in Education 128
5.3. Benefits of ICT in Education 130
5.4. Role of ICT in 21st Century's Teacher Education 136
5.5. Barriers and Solutions 142
5.6. Factors Influencing the Use of ICT 146
5.7. Teacher Attitudes, Perceptions, and Confidence in ICT Use 147
5.8. Role of ICT in Improving Quality of Education 149
5.9. Role of ICT in Improving Quality of Higher Education 160

5.1. INTRODUCTION

Information and communication technology (ICT) has become a critical source of innovation and efficiency improvement for a variety of sectors worldwide. Particularly in the education sector, the use of ICT has become a critical component of the learning process for university students both outside and inside the classroom setting. During the last two decades, the government and other education stakeholders such as university administration and researchers have invested millions of dollars in ICT adoption in the education system. The majority of universities that have fully embraced ICT have seen significant advancements in the use of ICT to improve learning methods, teaching, research, and development. Information and communication technology (ICT) is one of the most recent innovations that has revolutionized numerous global operations. It is especially critical in the field of education, as it has recently created platforms and opportunities that have enabled the acquisition of knowledge to some extent. This chapter discusses the policy of ICT in education, the benefits of ICT in education, and the role of ICT in bringing about changes in learning.

5.2. SIGNIFICANCE OF ICT IN EDUCATION

ICT has delivered a significant contribution in not only the field of education, but in various other domains. Technologies are making a significant contribution to the successful completion of numerous tasks in all fields and areas. Individuals are making extensive use of technology to carry out a variety of tasks and activities, according to research. These activities include communicating, sending messages, gathering information, completing assignments, reports, articles, and projects, as well as leisure and recreation (Figure 5.1).

When individuals are required to work cooperatively and in unison to effect change, they must be aware of certain characteristics. These include the development of critical, thoughtful, logical, and rational decision-making abilities, the enhancement of existing skills and abilities, the expansion of effective communication skills, the ability to work in a team, the ability to deal with problems and challenges, the ability to deal with dynamic situations, the ability to generate awareness, the engagement in regular practice, and the effective use of technologies (Meenakshi, 2013).

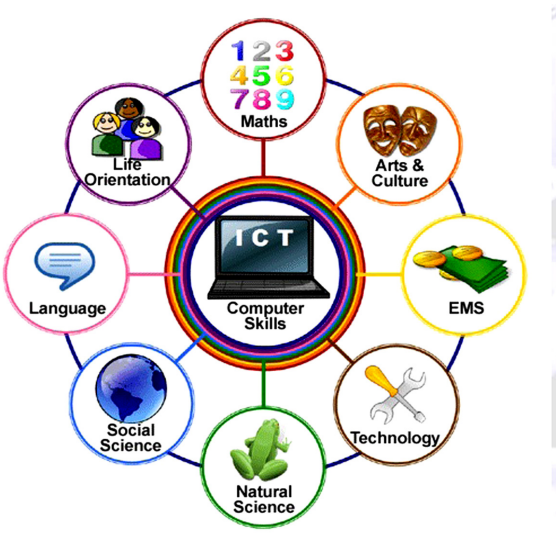

Figure 5.1. The advancements in ICT have resulted in advancements in the execution of tasks and activities.

Source: https://th.bing.com/th/id/R.f83f0a3cce62c1fa599141855820e4fa?rik=%2fYanlboW65mHiw&riu=http%3a%2f%2f3.bp.blogspot.com%2f-ka9HP6QDqI0%2fUb80c5vdNOI%2fAAAAAAAAADg%2fxh5h-0BCpiE%2fs1600%2fict-integration.jpg&ehk=ztmYa%2b48aQEPydakqLdGdG58Cc%2fWx7T5S3Rpumfus9g%3d&risl=&pid=ImgRaw&r=0.

5.2.1. ICT Policy in Education

The importance of ICT in education has been recognized globally. The technology integration initiative was established to assist schools in enhancing their technological infrastructures. The teaching skills initiative recognized that there was a lower priority placed on computer use in schools unless teachers possessed strong technical skills. When teachers received technology training and concentrated on skill development, the emphasis was primarily on three major aspects. These include the development of ICT skills and awareness, the development of ICT professional skills, and the development of pedagogical skills (ICT in Schools, 2008). Apart from developing these skills, it is critical for them to engage in consistent practice to reinforce their abilities and skills. Engaging in regular practice to improve technical skills benefits not only teachers, but also students (Figure 5.2).

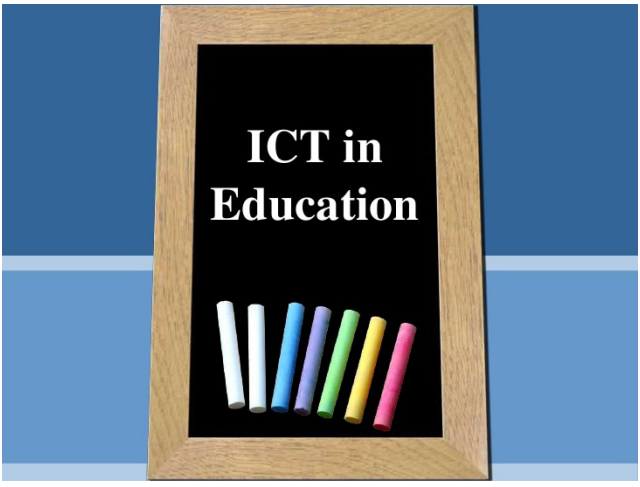

Figure 5.2. There is a need to raise the bar for ICT infrastructure in schools, particularly in rural areas.

Source: https://th.bing.com/th/id/R.4d0f341655e3be0a4307ed85883bc5c3?rik=8VIxd8gWGnyn4A&riu=http%3a%2f%2fimage.slidesharecdn.com%2fictineducation-111017101827-phpapp01%2f95%2fict-in-education-1-728.jpg%3fcb%3d1318864784&ehk=D8XX5YuMGl3HXytXqAufDqSKbYJG%2bds33JTWhg25ocA%3d&risl=&pid=ImgRaw&r=0.

Regrettably, students in rural communities' face setbacks and obstacles in their pursuit of academic goals. Class VIII students are unable to read English textbooks from the second grade. Students in Class VIII are incapable of solving numerical problems involving basic division and so on. These issues are growing within the educational system as a result of insufficient teaching-learning methods and instructional strategies. Another significant factor is that teachers in rural schools continue to use traditional teaching methods and have not implemented ICT. When teachers do not employ modern and innovative methods, it is obvious that they will face obstacles in carrying out their job duties effectively and achieving academic goals. As a result, the use of ICT in education is critical in both urban and rural communities.

5.3. BENEFITS OF ICT IN EDUCATION

The benefits of ICT in education have been classified into various categories which are discussed in subsections (Figure 5.3).

Figure 5.3. Role of ICT in 21st century education.

Source: https://image.slidesharecdn.com/21stcentury-141015163201-conversion-gate01/95/21st-century-ict-education-2-638.jpg?cb=1416400051.

5.3.1. Teaching-Learning Processes

Teachers at all levels of education have made extensive use of ICT to impart knowledge and information to their students. Teachers in nursery schools use computers and the internet to enhance students' knowledge of various concepts. They demonstrate to students how to draw shapes, color, and paint concepts on computers. The internet is used to watch cartoons or movies, as well as to view images and other media. Students typically begin learning the fundamentals of computers in secondary and senior secondary schools. They may initially feel vulnerable, but with sufficient practice, they can develop their technical skills. After they have mastered the concepts, regular practice will assist them in honing their technical abilities.

Teachers encourage students to use the internet to help them gain a better understanding of various concepts. Students enjoy utilizing technology to complete assignments, reports, projects, and other documents. In higher educational institutions, technology has been viewed as an integral part of education for students pursuing bachelors, masters, and doctoral degrees.

When professors are required to deliver lectures on specific subjects, they prepare their learning materials using technology and the internet. On the other hand, when students are required to complete assignments, reports,

or projects, or even when they are required to prepare for a test or exam, they utilize technology. Individuals pursuing doctoral degrees are required to work on a thesis. Thus, individuals make use of technologies in order to gain a thorough understanding of the subject and to begin writing the project report.

Delivering presentations on a variety of subjects is viewed as an integral part of education in primary, secondary, and higher education. These can be implemented when individuals are technologically savvy. Thus, in order to accomplish academic goals effectively, it is critical for individuals to develop their technical skills.

5.3.2. Quality and Accessibility of Education

According to several researchers, students find computers and laptops to be more effective than handwriting when it comes to preparing assignments, reports, and projects. Individuals used to write their assignments and reports by hand before the advent of technology. When one writes by hand, one frequently encounters difficulties with corrections. However, when typing on a computer, corrections are simple. Individuals have discovered that copy, paste, and cut and paste options are extremely beneficial. The internet is regarded as critical. Through the use of the internet, individuals can gain a thorough understanding of a variety of topics, subjects, and areas. As a result, it is viewed as critical for enhancing the quality and accessibility of education. Students are typically from nursery and elementary schools. They are not well-equipped to use technology, but when they view images on the internet, they experience pleasure and develop motivation to pursue education.

Students enrolled in higher educational institutions, such as colleges and universities, can develop a thorough understanding of the significance of technologies and how they have improved the quality and accessibility of education. Lecturers typically explain concepts and provide notes in classroom settings. However, they have a limited amount of time in which they must complete the entire syllabus.

In some cases, students are unable to grasp concepts effectively through class notes or lectures. In such instances, they turn to the internet for assistance in resolving their problems. The internet facilitates access to adequate knowledge and information on a variety of concepts and subjects. Additionally, individuals are able to observe images. As a result, they are able to enhance their understanding and achieve desired academic outcomes

through the use of the internet. Another critical aspect that contributes to education's quality and accessibility is the research and writing process.

Research and writing are inextricably linked to the job duties of researchers and educators. When individuals are enrolled in doctoral programs, their supervisors and professors encourage them to write papers. Research and writing tasks can be completed effectively only when individuals have access to technology and the internet. Individuals working in the field of education are expected to continually improve their knowledge and skills in a variety of areas and conduct extensive research. Additionally, they are required to make appropriate use of technology in order to perform their job duties. As a result, the internet and technology have gained significant importance.

5.3.3. Learning Environment

The widespread use of ICT has made a significant contribution to the improvement of learning environments. Prior to the advent of technology, when students prepared their assignments with pens and pencils, they encountered difficulties making corrections. In some instances, the work was discovered to be untidy due to scribbling. This disappointed teachers, and as a result, students suffered academic setbacks. Thus, it can be stated that through the use of ICT, students are utilizing computers and organizing their assignments (Figure 5.4).

Figure 5.4. With the advancement of technology, students, and teachers have developed a greater capacity for rational and logical thought.

Source: https://th.bing.com/th/id/R.c7b585cd3a83c94cb01882b21d529887?rik=yQ9P36394BMpZA&riu=http%3a%2f%2fwww.green-modular.com%2fwp-content%2fuploads%2f2015%2f11%2f0029-GM1.jpg&ehk=PZ8iW15cI9SbeEOfeF0cJEYRm%2bl6c2WeJm1r2dzxkbs%3d&risl=&pid=ImgRaw&r=0.

Teachers are capable of implementing appropriate evaluation methods and assessing students' academic performance. Individuals are able to achieve their academic goals through extensive use of technology. ICT is transforming teaching and learning processes by infusing learning environments with elements of life. ICT is viewed as a potentially transformative tool for expanding educational opportunities (Noor-Ul-Amin, n.d.). Individuals in the modern era believe that improvements to the overall system of education can be made only through the use of ICT. Administrative staff members in schools, colleges, and universities are also utilizing technology to perform various job duties. These include, but are not limited to, technical, clerical, managerial, and administrative positions. When teachers and staff members are recruited, one of the primary requirements is that they, in addition to possessing educational qualifications and skills, be proficient in the use of technology. When individuals lack technical skills, they enroll in training centers to improve their technical abilities. As a result, it can be asserted that ICT has made a critical contribution to improving the overall learning environment.

5.3.4. Learning Motivation

Learning technology is not an easy task. When individuals of all categories and backgrounds and ages use technology, they feel vulnerable and apprehensive. However, when instructors impart knowledge to them, they advise them to engage in regular practice with the primary goal of honing their technical skills. When individuals are well-equipped with technology, they may work on their computers for longer than eight hours. They are able to increase their motivation and commitment to their work. On the other hand, when individuals realize that they can use technologies for leisure and recreation, they become more motivated to acquire technology-related information.

Apart from computers and laptops, other technologies such as smartphones, mobile phones, tablets, and notebooks are used in the modern era. ICTs such as videos, television, and radio, as well as multimedia computer software that combines text, sound, and colorful moving images, can be used to provide stimulating and reliable content that encourages students to participate in teaching-learning processes. In some cases, primarily in English and Hindi, when teachers have completed the lesson plan and the video of the lesson plan is also available on the internet, teachers require students to watch the video in order to facilitate comprehension.

Through effective listening, individuals can raise awareness about a variety of issues. ICT alters the characteristics of problems and educational tasks. As a result, they make a significant contribution to cognitive development by acting as a mediator. When students and teachers use ICTs to enhance teaching-learning methods and instructional strategies, they can increase job satisfaction, accomplish academic goals and objectives, and advance the overall educational system (Noor-Ul-Amin, n.d.).

5.3.5. Scholastic Performance

After gaining a thorough understanding of ICT, it was determined how effective it is at enhancing the educational system, teaching-learning methods, and instructional strategies. To improve academic performance, teachers, and students must collaborate and integrate their efforts. Teachers must develop a thorough understanding of their students' needs and requirements. They must put into practice teaching-learning methods and instructional strategies that are appropriate for their circumstances. Whereas, it is critical for students to pay adequate attention in class and maintain a consistent study schedule. Even when technology is not available and teachers are required to impart concepts to students verbally, teachers utilize the internet to gain a thorough understanding of the concepts and to prepare their lesson plans appropriately. ICT is widely regarded as making a significant contribution to increasing access to education, reiterating the relevance of education in increasingly digital school environments, and promoting an increase in superiority and eminence.

The use of ICT and the implementation of teaching-learning methods are inextricably linked (Noor-Ul-Amin, n.d.). Within educational institutions, ICT has significantly facilitated teaching and learning methods. However, in addition to acquiring an understanding of academic concepts, a variety of other tasks and activities are organized. These include, but are not limited to, workshops, seminars, conferences, competitions, and events. Students, primarily in schools, receive training in extracurricular activities such as dance, music, singing, art, handicrafts, and role playing. Thus, when teachers impart knowledge and information to students in terms of these concepts, they also utilize technology to aid in their comprehension. When individuals are unable to obtain training in a variety of concepts, they frequently turn to the internet to supplement their knowledge. Thus, it can be stated that when individuals utilize technologies appropriately, they are able to enhance their academic and extracurricular performance.

5.4. ROLE OF ICT IN 21ST CENTURY'S TEACHER EDUCATION

This is the 21st century, and it is also the information and technology age (IT). Science and technology pervade every aspect of life. Globally, a massive flow of information is emerging in all fields. Now, information, and technology are widely used in educational settings to make teaching and learning more successful and enjoyable for both students and teachers. In 1998, the UNESCO World Education report stated that students and teachers must have adequate access to digital technology and the internet in their classrooms, schools, and teacher education institutions. Teachers must possess the knowledge and skills necessary to effectively utilize new digital tools in order to assist all students in attaining a high academic standard.

The quality of teacher education's professional development is contingent upon the degree to which ICT is integrated into the program. According to UNESCO (2002), information, and communication technologies (ICT) are a scientific, technological, and engineering discipline and management technique used to manage information, its application, and association with social, economic, and cultural issues. Teachers are the lifeblood of any functioning society. Technologies play a significant role in teacher education programs. Students gain access to knowledge and information via television, digital media, cable television, the internet, and social media platforms such as Facebook, Twitter, WhatsApp, LinkedIn, Igo, Line, and WeChat. In the 21st century, ICT is critical for preservice teacher education programs. Without adequate knowledge of ICT, a teacher cannot effectively teach in his or her classroom, which cannot be considered complete.

5.4.1. Why Do We Use ICT in Teacher Education?

The traditional classroom is undergoing a transformation, shifting from one-way communication to two-way communication. Teachers and students alike now participate in classroom discussions. Now, education is centered on the child. Thus, the teacher should be prepared to deal with various forms of technology in order to incorporate them into the classroom and make teaching and learning more engaging. To implement certain student-centered methodologies effectively, such as project-based learning, which places students in the role of active researchers, technology becomes an appropriate tool. ICT enables more effective and timely communication; it enables the presentation of ideas in a more effective and relevant manner. It is an effective tool for acquiring information—students are encouraged

to seek information from a variety of sources and are now more informed than they were previously. As a result, ICT is critical for Teacher Education (Figure 5.5).

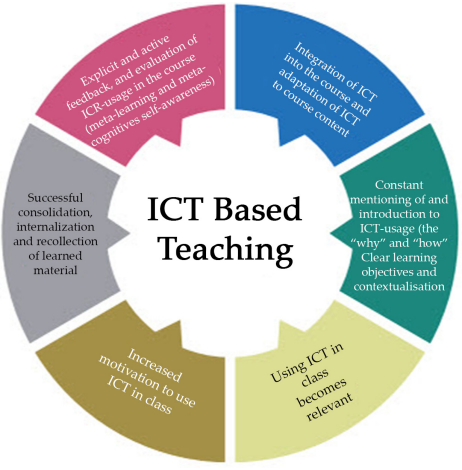

Figure 5.5. ICT in teacher education.

5.4.2. Recent Trends in Teacher Education

In response to the changing needs of our society, increased emphasis is now placed on various educational theories and practices. Teacher education also undergoes changes as a result of these theories and practices. It is only natural for teacher education to incorporate new technologies. Along with teaching skills, teachers should have the appropriate attitudes and values.

As we all know, the bare minimum requirement for any training program is that it assist the trainee in developing the fundamental skills and competencies of an effective teacher. Inter-disciplinary approaches, correspondence courses, and orientation courses are all new trends in teacher education today.

Teacher education programs also make use of simulated teaching, microteaching, programmed instruction, and team teaching. Nowadays, action research is used in teacher education as well. ICT serves as a portal to the world of information and assists teachers in staying current. It raises awareness of innovative instructional methodologies, assessment mechanisms, and other aspects of professional development.

5.4.3. Challenges Associated with Integrating ICT into Teaching and Learning

The convergence of computer, communication, and content technologies is referred to as ICT. It has piqued the interest of academia, business, government, and communities interested in utilizing it for novel profitable propositions. To compete in a global competitive environment, every nation must have a highly skilled and educated workforce with aptitude and skill sets in the application of ICT.

ICTs have the potential to be a powerful tool for expanding educational opportunities, both formal and informal, to previously underserved scattered and rural populations, as well as to groups historically excluded from education for cultural or social reasons, such as ethnic minorities, girls, and women, persons with disabilities, children with special needs, and the elderly, as well as to all others who, for cultural or social reasons, are traditionally excluded from education.

The use of ICT in schools will catalyze the cause and help schools achieve the goals of inclusive education. There is no conclusive research to demonstrate that using ICTs in education improves student achievement, whether in developed or developing countries. However, practitioners, and academics agree that integrating ICTs into education has a positive overall effect on the learning environment.

ICT is critical in schools and educational institutions because it enables them to perform activities and functions like record keeping, research, instructional uses, presentations, financial analysis, examination result management, communication, supervision, management information systems (MIS), teaching, and learning activities, and general school management functions. Integrating ICT into teaching and learning is a complicated process that can run into a number of roadblocks. These obstacles are referred to as "challenges" (Schoepp, 2005). A challenge is defined as "any circumstance that makes progress or achievement of an objective difficult" (WordNet, 1997; as cited in Schoepp, 2005, p. 2). The following are some of the major challenges associated with teachers' use of ICT tools in the classroom that have been identified.

5.4.3.1. Limited Accessibility and Network Connection

Numerous research studies indicate that teachers are unable to integrate new technologies into education due to a lack of resources, including home

access. Numerous research studies have identified a variety of reasons for lack of access to technology. Teachers complained in Sicilia's (2005) study about how difficult it was to always have access to computers. The author cited reasons such as "computers had to be reserved in advance, which teachers frequently forgot to do, or they could not reserve them for multiple periods in a row when working on multiple projects with students" (p. 50). In other words, a teacher would be unable to access ICT materials due to the fact that the majority of these were shared with other teachers. Becta (2004) asserts that inaccessibility of ICT resources is not always due to a lack of hardware, software, or other ICT materials within the school. It could be the result of a variety of factors, including inefficient resource management, low-quality hardware, inappropriate software, or a lack of personal access for teachers (Becta, 2004).

The barriers to teachers' access to new technologies are numerous and vary by country. According to Empirica's (2006) European study, the primary barrier to ICT use in education is a lack of access, and teachers reported a variety of barriers to using ICT in the classroom, including a lack of computers and insufficient material. Similarly, Korte and Hüsing (2007, p. 4) discovered that some infrastructure barriers exist in European schools, such as the lack of broadband access. They concluded that one-third of European schools remain without access to broadband Internet.

Pelgrum (2001) surveyed practitioners in 26 countries regarding the primary barriers to ICT implementation in schools. He concluded that four of the top 10 barriers were related to the accessibility of information and communication technologies. These impediments included an insufficient number of computers, peripherals, software copies, and immediate Internet access. Toprakci (2006) discovered that a lack of computers, the age or slowness of ICT systems, and a scarcity of educational software in schools all contributed to the failure of ICT implementation in Turkish schools. Similarly, AlAlwani (2005) discovered that a lack of Internet access during the school day and a dearth of hardware hampered technology integration in Saudi schools. Recent research on Syrian schools found that a lack of computer resources was one of the primary impediments to integrating technology into the classroom (Albirini, 2006).

5.4.3.2. School with Limited Technical Support

Teachers cannot be expected to overcome barriers to ICT use without adequate technical support in the classroom and access to whole school

resources (Lewis, 2003). Pelgrum (2001) discovered that one of the primary barriers to ICT use in education, according to primary and secondary teachers, was a lack of technical assistance. Technical difficulties were identified as a significant barrier for teachers in Sicilia's (2005) study. These technical barriers included waiting for websites to load, being unable to connect to the Internet, printers failing to print, computers malfunctioning, and teachers working on outdated computers. "Technical barriers harmed the lesson's smooth delivery or the natural flow of classroom activity" (Sicilia, 2005, p. 43).

Korte and Hüsing (2007) argued that ICT support or maintenance contracts in schools enable teachers to use ICT in the classroom without having to spend time troubleshooting software and hardware issues. According to the Becta (2004) report, "if a school lacks technical support, it is likely that technical maintenance will not be performed on a regular basis, resulting in an increased risk of technical breakdowns." Many respondents to Becta's (2004) survey indicated that technical failures might deter them from using ICT in their classrooms out of fear of equipment failing during a lesson. Numerous studies indicate that a lack of technical support is a significant barrier to implementing technologies in education.

According to Gomes (2005), integrating ICT into teaching requires a technician, and in the absence of one, a lack of technical support can be an impediment. In Turkey, Toprakci (2006) discovered that a lack of technical support was one of two significant barriers to integrating ICT into science education in schools, which could be considered "serious." In Saudi Arabia, science teachers would agree to incorporate computers into their classrooms if they were not concerned about technical support or hardware issues (Almohaissin, 2006). Sicilia (2005) argued that regardless of the level of technical support and access available to teaching staff, whether they have 20 years of experience or are new to the profession, technical issues create barriers to teachers delivering lessons smoothly.

5.4.3.3. Inadequate Training

The most frequently mentioned challenge is a lack of effective training (Albirini, 2006; Balanskat et al., 2006; Beggs, 2000; Zden, 2007; Schoepp, 2005; Sicilia, 2005; Toprakci, 2006; Ghavifekr and Wan Athirah, 2015). Pelgrum's (2001) study concluded that there were insufficient opportunities for teachers to receive training in the use of ICTs in the classroom. Similarly, Beggs (2000) identified a lack of training as one of the top three barriers to

teachers' use of ICT in the classroom. Recent research in Turkey discovered that the primary impediment to implementing new ICT in education was an insufficient amount of in-service teacher training. Zden (2007); and Toprakci (2006) concluded that limited teacher training in ICT use is an impediment in Turkish schools.

According to Becta (2004), training is undoubtedly complex because it requires consideration of a variety of factors to ensure training effectiveness. These included time for training, pedagogical preparation, skill development, and the incorporation of ICT into initial teacher education. Accordingly, Gomes's (2005) recent research on a variety of subjects concluded that a lack of digital literacy training, insufficient pedagogic and didactic training on how to use ICT in the classroom, and a lack of training on technology use in specific subject areas were all barriers to incorporating new technologies into classroom practice.

Several Saudi Arabian studies reported similar reasons for educational technology (ET) failures: inadequate teacher training in computer use, reliance on a "delivery" teaching style rather than investment in modern technology, and a shortage of teachers qualified to confidently use technology (Sager, 2001). Providing teachers with pedagogical training, rather than simply training them to use ICT tools, is a critical issue (Becta, 2004). Cox et al. (1999a) argue that in order to persuade teachers of the value of using ICT in their classrooms, their training should emphasize pedagogical issues.

Cox et al. (1999a) discovered that even after teachers attended professional development courses in ICT, they still did not know how to use ICT effectively in their classrooms; rather, they knew how to operate a computer and set up a printer. They explained that this is because the courses focused exclusively on teachers acquiring fundamental ICT skills and rarely taught teachers how to develop ICT's pedagogical aspects. In line with Cox et al. (1999a) research, Balanskat et al. (2006) concluded that insufficient teacher training is hindering teachers' use of ICT in their classrooms and when preparing lessons. They assert that this is because training programs place a greater emphasis on developing ICT skills than on teachers' pedagogical practices in relation to ICT. Fundamentally, when new tools and approaches to teaching become available, teacher training is critical (Osborne and Hennessy, 2003) if they are to successfully integrate them into their classroom instruction.

However, according to Balanskat et al. (2006), insufficient or inappropriate training results in teachers who are neither adequately

prepared nor confident to integrate ICT fully into the classroom. According to Newhouse (2002), "teachers need to develop not only computer literacy, but also skills in integrating computer use into their teaching/learning programs."

5.4.3.4. Time Constraint

Numerous recent studies indicate that while many teachers possess competence and confidence in using computers in the classroom, they continue to underutilize technology due to a lack of time. Numerous researchers identified time constraints and the difficulty of scheduling sufficient computer time for classes as impediments to teachers' use of ICT in the classroom (Al-Alwani, 2005; Becta, 2004; Beggs, 2000; Schoepp, 2005; Sicilia, 2005). According to Sicilia (2005), the most frequently reported difficulty faced by all teachers was a lack of time to plan technology lessons, explore various Internet sites, or investigate various aspects of educational software.

Becta's (2004) study discovered that teachers face time constraints in numerous facets of their work, affecting their ability to complete tasks, with some participant teachers stating specifically which aspects of ICT require more time. These costs include time spent locating Internet advice, preparing lessons, exploring, and practicing with technology, resolving technical issues, and receiving adequate training.

5.4.3.5. Lack of Teachers' Competency

Another issue that directly affects teacher confidence is teachers' ability to integrate ICT into their pedagogical practices (Becta, 2004). Newhouse (2002) discovered that many teachers in Australia lacked the knowledge and skills necessary to use computers and were uncooperative about the changes and inclusion of supplementary learning that would accompany integrating computers into their teaching practices.

5.5. BARRIERS AND SOLUTIONS

5.5.1. From the Perspective of Students

Although previous research has demonstrated the benefits of using ICT in the classroom, barriers or challenges to its use continue to exist. Frederick, Schweizer, and Lowe (2006) demonstrated that the primary challenges

associated with ICT use are student mobility, special needs, and anxiety about standardized test results. These obstacles can be overcome by increasing the authenticity of group and problem-based learning activities and by providing adequate learning support (Whelan, 2008). Whelan (2008) also identified additional barriers from the student perspective, including: inadequate technical skills that limit access to ICT in the classroom; an insufficient number of academic advisors and instructors who provide timely feedback; and decreased interaction with peers and instructors. As a result, the following strategies can be recommended to aid in the learning process: increased student induction, orientation, and training; increased emphasis on the importance of instructor access and effective administration; and expansion of podcasting and online conferencing tools.

To reduce student barriers and increase the effectiveness of ICT use in the classroom, capacity building, curriculum development, infrastructure development, policy development, and government support are required. Additionally, Castro and Alemán (2011) encourage students to develop specialized technical skills to aid in learning in ICT-enabled environments.

5.5.2. From the Perspective of a Teacher

From a teacher perspective, barriers to effective technology integration include the following:

- Low teacher expectations and a lack of clear goals for ICT use in schools (Al-Bataineh et al., 2008);
- A lack of collaboration and pedagogical support, and also a lack of experience among cooperating teachers (Ertmer and Otternbreit-Leftwich, 2010);
- Inadequate time to master new software or integrate IC (Al-Bataineh et al., 2008).
- Numerous strategies for overcoming these obstacles have been proposed.
- Provide professional development activities related to technology to keep teachers' skills and knowledge current, as well as provide technical support as needed (Al-Bataineh et al., 2008);
- Facilitate partnerships that enable teachers to share effective technology practices and experiences (Ertmer and Otternbreit-Leftwich, 2010);

- Conduct workshops that enable teachers to reflect on effective strategies for integrating technology into instruction and to uncover issues critical to comprehending the process of technology integration into instruction (Almekhlafi and Almeqdadi, 2010; Liu and Szabo, 2009; Tezci, 2011a; Yildirim, 2007). Technology should be used for purposes other than assisting in the implementation of traditional teaching methods (Tezci, 2011a).

According to Tezci (2011a), teachers should not only learn how to integrate technology into traditional teaching and increase productivity, but also how to integrate ICT into classroom activities in order to promote student learning. This means that teachers must be more innovative and productive in their use of ICT in order to create more engaging and rewarding activities and lessons (Birch and Irvine, 2009; Honan, 2008).

As a result, Castro and Alemán (2011) recommended that teachers remain receptive to ICT integration in the classroom. When teaching with technology, it is critical for teachers to develop new teaching strategies in order to adapt to the new instruments. Yildirim (2007), on the other hand, discovered that teachers use ICT more frequently to create handouts and tests than to promote critical thinking. Similarly, Palak and Walls (2009) discovered that teachers use technology primarily to supplement their existing teaching strategies and rarely to promote student-centered learning. According to the authors, one explanation could be a lack of models for how to use technology to facilitate learning, as well as constraints imposed by contextual factors such as class size and student ability.

Additionally, Brush, Glazewski, and Hew (2008) discovered that preservice teacher preparation does not adequately prepare students for technology-based instruction or successfully demonstrate appropriate methods for integrating technology into a curriculum. More training should be included in pre-service teachers' curricula, and ICT skills should be applied in the classroom to enable effective technology strategies to be integrated (Supon and Ruffini, 2009). To assist teachers in overcoming these obstacles, Chen (2008) proposed that, in addition to providing education theories, ICT researchers should document examples of how teachers integrate technology effectively and meaningfully to meet their pedagogical goals and needs.

5.5.3. From an Administrative and Information Technology Infrastructure Perspective

Along with the difficulties encountered by students and teachers when utilizing ICT, additional barriers exist in terms of administrative and ICT infrastructures. Among these barriers are the following:

- School inspectors place a higher premium on course content and student test scores than on ICT usage (Yildirim, 2007);
- A lack of appropriate administrative support for effective ICT use (Lim, 2007);
- Administrative mandates to improve examination results, which shifts the emphasis away from using ICT to engage students in higher-order thinking activities (Goktas, Yi, and Yildirim, 2007).

Yildirim (2007) suggested that schools should provide appropriate access to technology in order to overcome these barriers. Additionally, schools, and related institutional systems must implement new policies that empower teachers to participate in decision-making and planning processes related to ICT in their classrooms. Lim (2007) conducted a qualitative study to ascertain the effectiveness and ineffectiveness of ICT integration in schools with the goal of providing concrete solutions. The findings indicated that the availability of ICT tools, the establishment of disciplinary and educational principles and procedures, as well as the division of labor among teachers, teaching assistants, and students, are all critical components of successfully managing an ICT-integrated classroom. By highlighting these elements, we can facilitate a learning process that is more likely to engage students in higher-order thinking.

Ertmer and Otternbreit-Leftwich (2010) conducted a review of the existing literature to determine the components necessary for pre-service and in-service teachers to effectively use ICT as a pedagogical tool. They recommended that schools provide evidence to teachers demonstrating the beneficial effects of technology-based and student-centered instruction on student learning and achievement on standardized tests. For example, schools can provide opportunities for preservice teachers to observe a variety of examples and models before applying them to real learners. Schools must assist pre-service teachers in identifying potential barriers to using ICT in their classrooms and presenting effective strategies for overcoming them.

To summarize, school leaders must ensure that teachers understand that the ultimate goal of technology integration is to enhance, not to replace,

the teaching and learning process. Creating a pedagogical model requires a strong connection between theory and practice in order to assist teachers in overcoming barriers to the technology integration (Keengwe and Onchwari, 2009). Thus, Staples, Pugach, and Himes (2005) stated that effective technology integration planning requires a distinct underpinning.

5.6. FACTORS INFLUENCING THE USE OF ICT

Factor affecting the use of ICT can be divided into external factors and internal factors. The two types of factors are related to one another and to the level of ICT usage (Tezci, 2011a). External factors affecting the progression or effectiveness of technology integration in schools have been identified. These include the availability of technology, access to ICT equipment, time for instructional planning, technical, and administrative support, school curriculum, school climate and culture, faculty teaching load and management routines, and pressure to prepare students for national entrance exams (Al-Ruz and Khasawneh, 2011; Lin, Wang, and Lin, 2012; Tezci, 2011a). The most prevalent of these external factors are a lack of access to computers and software, insufficient time for course planning, and insufficient technical and administrative support (Chen, 2008). Al-Ruz and Khasawneh (2011) discovered that certain external factors, such as the availability of technology and support from technicians, teachers, and principals, were positively associated with technology integration. Thus, availability of technology and overall support are critical for technology integration. The stronger the support structure and availability of technology, the more effort teachers make to integrate technology.

Numerous internal factors also influence the outcome of technology integration (Sang et al., 2011). Internal factors affecting teachers include their understanding of ICT use; their beliefs about ICT use; their attitudes toward technology integration; their perceptions, including their intention or motivation to use ICT; their self-confidence and knowledge; their technology skills; their readiness to use ICT; and their technology self-efficacy (Al-Ruz and Khasawneh, 2011; Chen, 2008; Lin, Wang, and Lin, 2012; Sang et al., 2011; Tezci, 2011a).

Chen (2008) identified two recurring issues relating to internal factors. To begin, teachers may implement policies based on inadequate or faulty theoretical interpretations and comprehensions of ICT use. Second, teachers may be under pressure to cover all content and may be unwilling or hesitant to allow students to explore content independently using technology due to

other conflicting beliefs. These concerns suggest that teachers' beliefs may not be reflected in their practices. A competitive school culture and a high-stakes assessment system can deter teachers from incorporating technology into their classrooms. Thus, teacher beliefs have an effect on how ICT is used in the classroom (Chen, 2008). More precisely, Teo et al. (2008) conducted a quantitative study to determine whether there is a relationship between pre-service teachers' beliefs about teaching and their use of technology. Constructivist teaching beliefs were associated with both constructivist and traditional technology use. On the contrary, constructivist technology use was significantly and negatively correlated with traditional teaching beliefs. The study's findings imply that Singaporean pre-service teachers are inadequately prepared to facilitate students' knowledge construction. While technology can facilitate interactive, self-directed learning and higher order thinking (HOT), integrating technology is not the most effective method of enhancing learning.

Learners will be assisted in an active learning process and encouraged to organize information through the use of internal cognitive connections through a combination of constructivist learning and technology. As a result, ICT will be ineffective in the classroom without teachers who are knowledgeable about both the technology and how to use it to accomplish educational goals (Koc, 2005).

5.7. TEACHER ATTITUDES, PERCEPTIONS, AND CONFIDENCE IN ICT USE

Internal variables have a significant impact on how teachers integrate technology in the classroom. However, which variable has the greatest impact on ICT use and how ICT preparation programs influence internal variables are discussed below. Palak and Walls (2009) conducted a mixed-methods study to determine whether teachers who integrate technology frequently and work in technology-rich schools shift their beliefs and practices toward a student-centered paradigm. Their practices remained unchanged; neither student-centered nor teacher-centered beliefs are significant predictors of practices. Teachers' attitudes toward technology, on the other hand, are significantly associated with teacher and student technology use, as well as the use of a variety of instructional strategies (p 0.05). Sang et al. (2010) examined the effect of gender, constructivist teaching beliefs, teaching self-efficacy, computer self-efficacy, and computer attitudes on prospective ICT use among Chinese student teachers. The findings corroborated Palak and

Walls' (2009) findings that teachers' attitudes toward ICT were the strongest predictor of future ICT use. Apart from the influence of teacher attitudes, Sang et al. (2010) found that preservice teachers with strong constructivist teaching beliefs have greater intentions to incorporate technology into their future teaching practices. Additionally, more confident pre-service teachers demonstrated greater capability and interest in utilizing computers in real classrooms. Thus, while teachers' attitudes toward ICT use were found to be the strongest predictor of technology integration, their beliefs and confidence in using ICT should not be overlooked. Internal variables can account for a portion of the success of classroom technology integration.

The impact of these variables, however, may change as a result of participation in technology preparation courses or programs. Abbott and Faris (2000) investigated pre-service teachers' attitudes toward computer use prior to and following a semester-long technology literacy course. The results indicated that after taking the course, students' positive attitudes toward computers improved as a result of the instructional approaches, meaningful assignments that required technology, and supportive faculty. Thus, the authors argued that teacher education programs should teach preservice teachers how to incorporate computers into their teaching strategies and activities, not just how to use hardware and software. Additionally, the authors noted that small groups and collaborative learning are the most effective methods for introducing new hardware and software because more advanced and experienced teachers can assist those who require additional assistance with technology learning.

Doering, Hughes, and Huffman (2003) conducted a similar study, analyzing pre-service teachers' perspectives on ICT in their future classrooms prior to and following their participation in a teacher preparation program. Teachers were skeptical of the utility of ICT in the classroom prior to taking the preparation courses, implying that they would carefully examine and consider technology integration rather than blindly incorporate it into their teaching practices. After completing the courses, their reservations had shifted to more optimistic sentiments. Teachers gained a better understanding of how to incorporate ICT into the classroom. While the teachers faced additional challenges such as technology availability, accessibility, professional support, and classroom management, their attitudes toward technology had shifted. They were more likely to believe in the potential of technology to aid in learning and to recognize its significance. Serhan (2009); and Chai, Koh, and Tsai (2010) also examined pre-service teachers' attitudes toward the use of computer technology and the efficacy of ICT

courses. Both studies found that pre-service teachers recognized the value of integrating technology into their curricula and believed that ICT use would enhance student learning after participating in courses. They felt that such courses prepared them to apply ICT in the future and improved their ability to select, evaluate, and use a variety of technological resources.

More precisely, Chai, Koh, and Tsai (2010) discovered that ICT courses that included direct instruction on the use of technological tools via the technology enhanced lesson (TEL) approach assisted teachers in developing an understanding of how to use technologies as supporting tools to enhance their teaching and student learning. As a result, pre-service teachers rated the preparation course positively. It is worthwhile to investigate the extent to which ICT preparation courses or programs alter teachers' intentions and behaviors.

Choy, Wong, and Gao (2009) conducted a mixed-methods study to ascertain pre-service teachers' intentions prior to and following a technology preparation course. Their intentions were then compared to their actions during their teaching regarding technology integration. Confirming previous findings from Doering, Hughes, and Huffman (2003), the findings indicated that as a result of increased pedagogical knowledge, their intentions became significantly more positive. However, these teachers were unable to translate their positive intentions into effective teaching, owing in large part to unfamiliar school environments. Choy, Wong, and Gao (2009) concluded from these findings that teacher education programs should raise awareness of the benefits of incorporating technology into student-centered learning approaches and provide pedagogical knowledge about both student-centered learning and technology integration strategies. Apart from the effect of preparation courses on teacher perceptions and attitudes, Vannatta and Beyerbach (2000) reported increased fluency in the use of technology and instructional methods. They discovered a significant increase in preservice and in-service teachers' technology integration following participation in a preparation course. Teachers were able to integrate a constructivist perspective on technology integration into their instruction regarding the course.

5.8. ROLE OF ICT IN IMPROVING QUALITY OF EDUCATION

The use of ICT has made a significant contribution to the improvement of educational quality. Individuals are required to perform a variety of tasks and

functions in educational institutions at all levels. Individuals are required to use ICT to carry out various tasks and functions. Individuals can generate awareness and enhance their knowledge in a variety of areas through the use of ICT. When educators require enhancements to their teaching-learning methods and instructional strategies, they utilize ICT. On the other hand, when students are required to complete assignments and projects, they utilize ICT to ensure that their work is organized and meets the desired standards. The primary aspects considered here are ICT as a change agent in the learning process, ICT as an aid to educational management, factors affecting the quality of education delivered via ICT, and the role of ICT in enhancing educational quality.

The use of ICT in pedagogy has established certain benchmarks for integrating ICT into the learning process as a means of enhancing the quality of education in particular social contexts. The application of ICT to enrich learning environments within schools has demonstrated the conditions under which ICT can be used effectively to improve the quality of teaching-learning processes and instructional strategies. It contributes significantly to the creation of social payoffs that are necessary for sustainable growth and equitable development. Infrastructure, well-qualified, and experienced teachers, facilities, appropriate teaching materials, and adequate classroom environmental conditions are all considered necessary but insufficient to improve the quality of education. Integration of ICT tools into the curriculum and instructional methods is necessary. These are deemed significant in terms of enhancing the quality of learning (Gupta and Haridas, 2012).

Within the framework of ICT integration into curricula and instructional processes. Teachers make a significant contribution. They must have adequate knowledge and information regarding modern and innovative methods. The integration of ICT and contemporary and innovative methods into the educational system facilitates the achievement of educational goals. According to research, computer-aided learning is more beneficial in primary schools than in secondary schools. It was the result of a combination of significant increases in ICT funding and a productive environment conducive to efficient use. This has resulted in beneficial effects on educational expenditure and performance. As a result, increasing funding for ICT is insufficient to ensure an increase in educational quality. The successful implementation of ICT is contingent upon the educational institutions' human and financial resources (Gupta and Haridas, 2012).

5.8.1. ICT as a Facilitator of Change in the Learning Process

ICT plays a critical role in the educational system and in the execution of social transactions. The use of ICT has resulted in significant improvements in the ways in which teachers and other educational institution personnel work. The integration of ICT into teaching-learning processes and instructional strategies has a beneficial effect on the educational system. In other words, educational institution personnel are able to carry out their job responsibilities in a well-organized and manageable manner while also feeling pleasurable and content. The use of ICT facilitates the creation of a favorable learning environment. Within a supportive learning environment, students, and teachers are able to contribute satisfactorily to the achievement of academic goals through collaboration and integration. The use of multimedia in the classroom creates a vibrant learning environment that is tailored to the students' needs and requirements (Kaur, 2015).

The emphasis is placed on content in the conventional learning process. The course's content and syllabus are deemed significant. It is critical for teachers to prepare thoroughly prior to arriving in class to deliver their lectures. The use of ICT promotes independent learning and takes alternative theories of learning into account. The conventional educational process places a premium on teacher planning and guides students through a series of structural sequences in order to achieve the desired outcomes. With the assistance of technology, transformations from teacher-centered to student-centered education are facilitated (Kaur, 2015).

Technology is critical in sustaining and enhancing cross-disciplinary research and teaching programs. Additionally, collaboration, and integration between research and development units within businesses and higher educational institutions are promoted (Pandya, 2016). Educational institutions can establish communication terms and generate knowledge and information about approaches and strategies that are implemented in other educational institutions through the use of ICT.

5.8.2. Using ICT to Improve Educational Management

Computer software programs have been implemented to assist in the timetabling and management of schools. ICT is considered indispensable for managing educational tasks, functions, and activities. To accomplish desired goals and objectives, time management skills must be improved. All members of educational institutions, including principals, directors, teachers, students, and staff, are expected to demonstrate effective time

management abilities. The primary reason for this is that, in addition to performing job duties, they must also fulfil other responsibilities. These are primarily concerned with household chore management, meeting the needs and requirements of family members, and so forth. Individuals can effectively carry out household responsibilities and job duties through the use of ICT. Schools can improve the quality of education at a lower cost by implementing ICT. In other words, ICT use is cost effective (Kaur, 2015).

New ICTs have the potential to significantly increase the quantity and quality of teacher education. Combining traditional ICTs to expand coverage and providing access to new ICTs that facilitate communication is supposed to be cost-effective for teacher education. If a nationwide network of community learning centers equipped with computer laboratories and trained staff members to facilitate access to online distance learning and to provide support and assistance should be established in educational institutions at all levels (Kaur, 2015).

The use of ICT is intended to enhance the value of education by facilitating more effective pedagogy for knowledge provision among learners and by enhancing communication processes that support learning. Additionally, ICT becomes more pervasive through the use of computer-based equipment. It is ingrained in all facets of educational institutions' operations (Odhiambo, 2013). This way, teachers, and students are able to not only achieve desired academic outcomes, but also improve educational management.

5.8.3. Factors Influencing Quality of Education Through ICT

When implementing measures to improve educational quality through ICT, certain considerations must be made. These are as follows:

1. **Identifying and Defining Learning Objectives:** At all levels of education, educational institutions have specific learning goals and objectives that they strive to achieve. One of educational institutions' primary learning objectives is to ensure that teaching and learning processes are organized in such a way that they promote students' effective growth and development. Students are able to expand their knowledge and understanding in order to successfully complete personal and professional goals. The effectiveness of teaching-learning methods and educational programs can be evaluated through the lens of learning objectives, which are defined as specific knowledge, abilities, and behavioral

characteristics that individuals should possess.

2. **Managerial Functions:** Individuals enrolled in educational institutions must possess the necessary knowledge, skills, and abilities to perform managerial functions. Planning, organizing, directing, staffing, coordinating, and controlling are all critical managerial functions that are carried out. When ICT is required to improve the quality of education, individuals must plan a variety of methods and approaches. Organizing promotes task and activity organization in accordance with requirements. The term "directing" refers to the process of directing activities and functions in accordance with educational goals and objectives. Staffing is a term that refers to the process of selecting and recruiting trained, qualified, and experienced individuals. These individuals should be capable of acquiring a thorough understanding of how to perform job duties effectively. Coordination is used to refer to the process of coordinating various tasks, approaches, and programs. Control is a term that refers to the management of resources and the maintenance of a pleasant work environment. One must ensure that resources are utilized effectively and efficiently.
3. **Leadership Qualities:** When ICT is integrated into the curriculum and instructional methods, teachers, and principals must collaborate and integrate their efforts. They organize meetings in which they discuss the issues and exchange ideas and suggestions. Principals and directors serve as role models. It is their responsibility to ensure that teachers and administrative staff members are adequately equipped and utilize technology in an orderly fashion. Additionally, they organize workshops and training sessions for teachers and staff to help them expand their knowledge and understanding. After teachers acquire sufficient knowledge, they must integrate it into their teaching-learning methods and instructional strategies. They must ensure that technologies can be used effectively to enhance student learning and assist students in achieving their goals and objectives. To accomplish this, teachers must possess leadership abilities and apply them to promoting students' well-being.
4. **Processes of Decision Making:** Organizations and educational institutions regard decision-making processes as an integral part of their operations. When individuals implement ICT and other modern, scientific, and innovative methods to improve the

quality of education, they must ensure that productive decisions are made that benefit all members. Individuals must weigh the various available options and then make decisions that will benefit students significantly. Different types of technologies are used in educational institutions. As a result, when authorities participate in decision-making processes, they must consider a variety of factors. These include student age groups, learning abilities, subjects, financial resources, and the overall state of the environment. At all levels of education, computers, and mobile phones are widely used.

5. **Working Environment:** The working environment is considered critical, even more so when any measures to improve them must be developed. Certain educational institutions have an abundance of space, including a large number of classrooms, several computer labs, and library facilities. As a result, it is critical to implement ICT in such educational institutions. For instance, when library facilities are extensive, it is critical to ensure computer access. This is frequently the case for colleges and universities. On the other hand, in nursery schools, particularly those that are small and consist of only one or two classrooms, the use of ICT is limited. When staff members are unavailable and working conditions do not allow for adequate space, such schools recognize the use of ICT to a limited extent.

6. **School Resources:** The availability of school resources is viewed as critical. As previously stated, when educational institutions intend to implement modern and innovative techniques and methods, or to make use of technology, financial, and human resources are deemed critical. Financial resources are critical in enabling individuals to identify new practices and approaches for enhancing the overall educational system. The other resource is human capital. The term "human resources" refers to members of educational institutions who must possess the necessary skills and abilities in order to perform their job duties efficiently. When human resources are insufficient to perform required functions, advertisements for job openings are placed on websites, in newspapers, and in magazines. Appropriate candidates must apply for jobs, and then selections are made based on a variety of factors, including their educational qualifications, competencies, abilities, and job duties.

7. **School Context:** Within the school context, a number of factors that affect the quality of education delivered via ICT must be considered. These factors include the location of the school, its size, the number of classrooms, the number of students, teachers, and staff members, the socioeconomic status of the average pupil, and the overall environmental conditions.

When ICT is implemented, members of educational institutions must ensure that these factors are not adversely impacted. Teachers must possess effective skills and abilities in order to effectively integrate ICT into their teaching-learning methods and instructional strategies. When students incorporate technology into their assignments and projects, they must engage in consistent practice in order to enhance their skills and abilities and achieve academic goals.

8. **School Process:** Several factors must be considered during the school process, including facilities, procedures, and teacher characteristics. For example, in schools where adequate library facilities are not available, where little emphasis is placed on technology use, and where adequate infrastructure, facilities, and other equipment are not available, using ICT would be futile. These schools are largely concentrated in rural areas. On the other hand, schools in urban areas are well-developed and incorporate ICT into their teaching-learning methods, instructional strategies, administrative, and clerical job functions, and so forth. It has been demonstrated that when ICT is integrated into the educational process, individuals are able to perform their job duties in accordance with desired expectations and experience job satisfaction.

9. **Increased Subject Understanding:** Academic education is not simple. Teachers and students must work diligently and creatively to implement appropriate teaching and learning methods. Students gain a better understanding of the subject by incorporating ICT into their teaching-learning methods and instructional strategies. They can improve their understanding of various concepts and even observe pictures and images through the use of the internet. When one conducts a search on the internet for a particular subject, one can access a plethora of articles. Students occasionally have difficulty obtaining books and other documents pertaining to their subject. In these instances, they rely on technology and

the internet to gather information. As a result, they are able to develop a thorough understanding of the subject and successfully complete their assignments and projects.

10. **Increased Interaction and Teamwork:** When quality education, as well as other tasks and activities, are implemented through the use of ICT, individuals are able to promote an increase in interaction and teamwork. Prior to the advent of technology, when students used books and articles to prepare assignments, they typically worked independently, with little interaction or teamwork. However, with the advancement of technology, individuals are enhancing their communication abilities and promoting interaction and teamwork. Individuals who utilize technologies and work on projects develop mutual understanding and collaborate and integrate with one another.

5.8.4. The Role of ICT in Educational Quality

The role of ICT in enhancing educational quality has been deemed critical by students, teachers, non-teaching staff, and parents. These are as follows:

1. **Students:** When students use ICT effectively to gain a thorough understanding of academic concepts, to prepare their projects and assignments, and to accomplish academic goals, they are able to generate the desired outcomes and recognize the value of technology. When they are unable to obtain books, articles, or other reading materials, they rely on technology and the internet. When students are completing a research paper, they can access pertinent information via the internet. This enables them to complete their projects and assignments in a more manageable and timely manner. Students who utilize voice communication aids within educational institutions can develop their confidence and social credibility skills (Patra, 2014).

   Not only students, but also other individuals, can improve their communication skills through the use of ICT. Written communication is the primary mode of communication that is enriched by the use of ICT. Individuals can communicate with one another via email and text messages. When students learn how to use the internet effectively, they tend to use it not only to enhance their academic skills and abilities, but also in other areas. These activities include listening to music, watching movies and

other television programming, playing games, reading stories and other articles, and observing photographs and images of various objects, places, and things. Students enrolled in post-secondary institutions are utilizing the internet to search for jobs and other opportunities to advance their career prospects. In this way, the internet is widely used for a variety of purposes.

When students and other members of educational institutions learn how to use the internet effectively, they are able to meet their job requirements effectively. When students use computers, they are more likely to develop greater independence in completing their tasks and assignments. When students lack access to the internet and technology, their reliance on others increases. This could include teachers, classmates, or family members. At all levels of education, students with learning disabilities and other difficulties are present. Students face a variety of difficulties and obstacles, including visual impairments, hearing impairments, and speech impairments. When these students formulate the measures necessary to pursue their educational goals, their parents and teachers in schools provide the necessary facilities and technologies to assist them in accomplishing their educational goals.

In other words, technologies play a critical role in assisting individuals with learning disabilities in carrying out their assignments appropriately. Students who are visually impaired have the same access to the internet as their sighted peers in educational institutions (Patra, 2014). This way, they can receive adequate assistance from their peers in gaining a thorough understanding of the concepts.

2. **Teaching Personnel and Non-Teaching Personnel:** Teachers utilize ICT for a variety of purposes. They utilize the internet to increase their comprehension and awareness of academic subjects and concepts. They would then perform their job duties satisfactorily. Additionally, they are capable of effectively facilitating research and writing tasks. As research and writing are considered integral components of the professional development of teachers at all levels of educational institutions. When teachers incorporate ICT gadgets into their lectures, they are able to enhance their lectures and promote students' conceptual understanding. Additionally, by incorporating ICT into lectures

and class discussions, students can develop an interest in and motivation for learning. In some cases, teachers are introverts who avoid interaction with others. They are preoccupied with carrying out their job responsibilities and do not establish effective communication terms with others. They are able to improve their communication skills and establish positive terms and relationships with other members of their workplace through the use of technology.

One cannot work alone toward achieving desired goals and objectives. It is critical for individuals to develop positive terms and relationships with others and to work in collaboration and integration. Typically, teachers over the age of 50 lack the necessary skills and abilities to effectively use technology. They lack comprehension when it comes to emailing. Thus, the use of technology aids in the development of technical skills among teachers of all ages and backgrounds.

Non-teaching staff makes extensive use of ICT to carry out their jobs and functions. Individuals utilize a variety of technologies to carry out administrative, governance, and managerial functions. Computers, laptops, printers, photocopiers, and mobile phones are just a few examples. Non-teaching staff members are expected to perform a variety of job duties. Among the more significant ones are maintaining records and preparing letters, notices, and other documents. When departments or schools organize speeches, presentations, or talks, they disseminate information via email.

When seminars, conferences, or workshops are organized, administrative staff members are responsible for creating the schedule, brochures, and performing other duties as directed by heads, directors, or principals. When a new course or program is introduced, they are responsible for developing the schedule. Thus, it can be stated that in order for staff members to perform these functions, they must utilize technology and possess the necessary knowledge and aptitudes.

3. **Parents:** They ensure that their children grow and develop in an appropriate manner. They strive to achieve this goal by providing a high-quality education to their children and enrolling them in school. Individuals from all walks of life and backgrounds have recognized the value of education. They have raised awareness

about the importance of acquiring a high-quality education in order for children to lay the groundwork for effective growth and development.

Apart from education, parents instill moral and ethical values in their children, enabling them to communicate effectively with others, develop mutual understanding and positive terms and relationships with others in educational institutions, and accomplish their desired goals and objectives. When parents are imparting critical information to their children, it is critical for them to comprehend and effectively implement these characteristics.

When ICT is used to enhance the quality of education in schools and post-secondary institutions. Then, teachers ensure that students use it to complete their homework assignments, projects, and other assignments. When students are required to prepare for competitions, tests, or exams, they are also required to use ICT, most notably to improve their conceptual understanding. Thus, it is the parents' responsibility to ensure that technology and an internet connection are available at home in order to accomplish academic goals. When students have access to these facilities in their homes, they are relieved of the need to visit computer centers. They are capable of overcoming obstacles and obstacles that arise during the pursuit of academic goals and objectives. In some instances, parents, particularly mothers, who are educated but unemployed teach their children.

When parents teach their children in nursery schools, elementary schools, secondary schools, or senior secondary schools, it is critical that they have adequate knowledge and information about academic concepts. Students typically receive assistance from their parents in completing their homework assignments, preparing them for exams and competitions, and acquiring an efficient grasp of the concepts. Parents who assist their children in these areas make use of technology to prepare and hone their skills. Private tutors are occasionally hired to assist students. They, too, make use of technology to deliver training on a variety of subjects and lesson plans. Thus, when ICT is available in the home, students are able to achieve their academic goals.

The use of ICT has been instrumental in enhancing the quality of education at all levels. Individuals today, from pre-school to university level education, believe that when ICT is implemented, improvements can be made to teaching-learning processes, instructional strategies, administrative, governance, and managerial functions. To make effective use of ICT, it is critical for individuals to continuously improve their skills and abilities.

ICT acts as a catalyst for change within the learning process and improves educational administration.

5.9. ROLE OF ICT IN IMPROVING QUALITY OF HIGHER EDUCATION

Higher education systems have expanded exponentially over the last five decades to meet the demand for universal access to a high-quality education. This trend has accelerated further as a result of rapid advancements in information and communication technology (ICT). The demand for skilled and competent labor continues to grow in today's globalized society. In this context, universal access to high-quality higher education has emerged as a critical factor in economic growth and development. To increase access to higher education and expand its reach to the country's remotest regions, the contribution of open and distance learning facilities is increasing. Additionally, it supports aspirations for lifelong learning at an affordable price (Figure 5.6).

Figure 5.6. Role of ICT in improving higher education.

Source: https://qph.fs.quoracdn.net/main-qimg-86e04d8af8e-7a7e39674f61b1c354339.

ICT is an umbrella term that refers to any communication device or application, including radio, television, cellular phones, computer, and network hardware and software, and satellite systems, as well as the applications that are associated with them, such as videoconferencing and distance learning. When such technologies are used for educational purposes, specifically to support and enhance students' learning and to create learning environments, ICT can be considered a subfield of ET. ICTs are used in higher education to develop course materials; to deliver and share content;

to communicate between learners, teachers, and the outside world; to create and deliver presentations and lectures; to conduct academic research; to provide administrative support and to enroll students.

In today's information society, individuals must have access to knowledge via ICT in order to stay current on current events. Education, which has always been critical to a country's economic and social development, becomes even more critical in this scenario. Education not only improves an individual's productive abilities, but also his or her earning power. It enhances their sense of well-being and capacity for new ideas, increases their social interaction, provides access to improved health, and provides several additional intangible benefits. Numerous ICT products relevant to education have been used in education for a variety of purposes, including teleconferencing, email, audio conferencing, television lessons, radio broadcasts, interactive radio counselling, interactive voice response systems, audiocassettes, and CD ROMs.

Each year, society places an increasing premium on higher education. This is due in part to the ongoing expansion of knowledge, and thus of what must be included in courses and curricula, and in part to the increasing cognitive demands and diversity.

The advancement, convergence, and integration of information technology have resulted in a fundamental shift in the knowledge and skills that information technology faculty, students, colleges, and universities possess or are expected to acquire.

The integration of ICT into teaching and learning is a high priority for educational reform. Frequently, ICT is viewed as a necessary tool for full participation in the knowledge society. ICTs must be viewed as "a critical component of the cultural toolkit of teaching in the 21st century, providing new and transformative models of development that broaden the nature and reach of teacher learning wherever it occurs."

The field of Information and Communication Technology (ICT) encompasses a broad range of topics, including the nature of technology, how to use and apply a variety of technologies, and the impact of ICT on the individual and society. Technology is concerned with the manner in which things are done; with the processes, tools, and techniques that influence human activity. ICT is concerned with the new modes of communication, inquiry, decision-making, and problem-solving available to humans.

Enhancing and upgrading the quality of education and instruction is critical, particularly as education spreads and develops. ICTs can enhance

educational quality in a variety of ways: by increasing student enthusiasm and commitment, by enabling the acquisition of fundamental skills, and by enhancing teacher training. ICTs are also transformational tools that, when used properly, can encourage a shift toward a learner-centered environment.

5.9.1. Major Issues

Concern about the quality of content discourages individuals from using the internet for educational purposes. As previously stated, authorized content is less accessible, which results in misconceptions about the reliability and validity of accessible content. The cost of ICT programs is not always less than the cost of traditional face-to-face education. Inadequate technical awareness results in a lack of confidence when it comes to using online systems. The traditional curriculum framework is inadequate to address the implications of ICT. There is a possibility that advanced use of ICT will result in the teacher experiencing an Identity Crisis. Inadequate creative abilities for content design makes learning tedious. Ignoring cultural and local perspectives also impairs ICT's optimal approach. Language barrier, as the majority of available content is in English. The inadequacy of ICT tools for students with disabilities is a cause for alarm. Meeting their needs is critical for fostering inclusiveness and advancing the goal of universal development. Online education can occasionally create communication barriers.

Inadequate coordination between executive committees and individuals is another impediment. The radiation emitted by currently available ICT tools is extremely dangerous and detrimental to students' health. Inadequate teacher and student training programs.

Venkatesh and Davis (1996) identify the critical factors as external variables, perceived usefulness, and perceived ease of use, attitude toward use, behavioral intention, and social influence processes that influence the way technologies are used when presented to students. The aforementioned factors are also pertinent in the current context. External variables such as accessibility, infrastructure, time, training systems, and a lack of teacher competencies are all external variables. Perceived usefulness is a broad term that encompasses all of the factors that contribute to a teacher's belief in the use of technologies, including job performance, effectiveness, and increase in productivity. Perceived ease of use encompasses factors such as readability, usability, and controllability. Other factors relate to the teacher's personal and social characteristics.

The environment in which he/she works plays a significant role, as do his/her personal beliefs, which are necessary for the proper execution of technological programs. Fear of technology has its own consequences, resulting in educators' ignorance of technological advancements. In their local research, Nakaznyi, Sorokina, and Romaniukha (2015) identified an insufficiently developed system of incentives for information implementation and insufficiently developed regulations for the use of electronic tools. Kundu et al. (2018) also address several critical issues in their study, including a lack of trained teachers, a lack of knowledge regarding the integration of ICT into school and higher education curricula, insufficient administrative support, financial constraints, time management issues, and a lack of necessary infrastructure.

5.9.2. Challenges

- To increase the number of authorized portals in order to improve learning quality.
- To promote high-quality and productive research for direct implementation in classrooms, as well as to gradually apply cost-cutting ideas.
- To provide students and educators with accessible and interactive training programs.
- To adapt the curriculum framework to modern knowledge and make it ICT-friendly.
- To produce an increasing amount of content in local languages in order to preserve cultural values.
- To avoid miscommunication, the authorized content should be written in clear and simple language.
- To ensure that the use of ICT involves the human instructor because "emotions" are extremely important in learning and current technologies have not yet been optimized for emotional interaction. To provide users with health-related instructions.
- To establish an integrated authority that monetizes all of the factors affecting grassroots ICT implementation, as well as to serve as a government assistant body specializing in ICTs.

- To instill in students and educators a positive attitude toward the use of technology and innovative approaches. To properly define a teacher's role while utilizing ICTs.
- To prepare students for new roles as educators.

5.9.3. Solutions

Governments must take the initiative to create the necessary knowledge. For this purpose, a number of conferences and meetings can be organized. International organizations such as UNESCO may work on the subject matter of global knowledge. If possible, rapid advancement of global knowledge at the international level would benefit greatly and turn students into lifelong learners. Research cells should be established at the smallest possible micro-levels in order to encourage young minds and introduce their new ideas about the use of ICTs in educational practices in economically and technologically advanced ways. These research cells may be directly supervised by central or state government officials. These cells' innovations and ideas must be taken into consideration. If these are found to be useful, they should be promoted for further research and development in higher research authorities.

Students should be given proper training in the fundamentals of ICTs, and this training should be reviewed on a regular basis, and the curriculum of this training should be compatible with modern needs. They should be given a basic introduction not only to computer operation but also to other concepts such as e-business, e-marketing, e-commerce, e-library, and so on. Training for teachers and educators must be done in a unique way. Making them technically aware and training them for effective content delivery, as well as developing the students' brains, are critical. An attitude test must be administered in order to assess their attitude toward innovative approaches. A team of experts should be formed to constantly analyze the current curriculum framework from an ICT perspective and make recommendations to the appropriate authorities. Local language development Organizations should be established both within and outside of educational institutions, and skills in second/foreign language development should be developed.

Curriculum design at the institutional level can be done specifically for ICTs in order to have confident and competent teaching of the subjects. Respect for the teacher must be maintained at all times. Teachers should use ICT as a supplement to their instruction rather than as a replacement. Lifestyle education should be incorporated into the curriculum. Prior

research has proposed the formation of a pace-setting unit. This is essentially a controlling, coordinating, and executing committee made up of experts from various fields who would monitor global advancements in the field and implement them in the country. The educational environment should be designed in such a way that both students and educators can appreciate innovative approaches. The following are examples of teacher and student role shifts. As ICTs make learning learner-centered, the teacher is no longer the primary source of information; instead, he/she should see himself/herself as a facilitator of knowledge and a co-learner, allowing students to realize their own responsibility. When possible, the student should be active in his or her learning and develop knowledge expertise on his or her own.

Higher education is a critical subject for any country because it develops citizenship and the majority of the labor force that serves the nation. Higher education systems are expanding rapidly at the moment. In order to ensure both quality and quantity, it is critical to incorporate innovative approaches and technological advancements into the educational system. ICT is being used in all fields, including education. However, due to the issues raised in the chapter, the implementation of ICT in education is moving at a snail's pace. The increased use of information and communication technologies (ICTs) has changed teaching and learning at all levels of higher education systems, resulting in quality improvements. With the integration of ICT in the higher education system, the possibilities are limitless. The use of ICT in higher education not only improves the classroom teaching-learning process, but it also allows for e-learning. ICT has improved distance education. The teaching community can reach out to remote areas, and learners can access a high-quality learning environment from anywhere and at any time. It is critical that teachers or trainers incorporate technology into their teaching styles in order to provide pedagogical and educational benefits to students. Rather than acquiring computer skills and acquiring software and equipment, successful implementation of ICT to lead change is about influencing and empowering teachers and supporting them in their engagement with students in learning. Innovative technologies improve educational quality, but their implementation is not always simple.

Chapter 6

E-Learning and Virtual Classrooms

CONTENTS

6.1. Introduction 168
6.2. Meaning of E-Learning 168
6.3. Types of E-Learning 171
6.4. Advantages and Disadvantages of E-Learning 172
6.5. Benefits of E-Learning for Learners, Instructors, and Managers 175
6.6. E-Learning-Success Factors for Organizations Using E-Learning 179
6.7. E-Learning: A Panacea in the Time of COVID-19 Crisis 180
6.8. Virtual Classrooms 189

6.1. INTRODUCTION

As the 21st century begins, the use of e-learning is revolutionizing how people obtain training. Multimedia training programs are now available on CD-ROMs, the Internet, and Intranets. A significant advantage of information and communications technology is the potential to provide training more quickly, in all locations at the same time, and potentially at a lower cost than traditional classroom instruction. This chapter will show you about the benefits of e-learning as well as the fundamentals of creating online learning environments.

6.2. MEANING OF E-LEARNING

E-learning, also known as online learning or electronic learning, is the process of acquiring knowledge through the use of electronic technologies and media. In layman's terms, e-learning is "learning that is enabled electronically." Typically, e-learning takes place on the Internet, where students can access their learning materials at any time and from any location. Online courses, online degrees, and online programs are the most common forms of e-learning (Figure 6.1).

Figure 6.1. E-learning.

Source: http://blog.quikr.com/2016/05/16/4-stunning-developments-in-the-e-learning-world/.

6.2.1. Definition

E-learning is a learning system that is based on formalized teaching but uses electronic resources. While teaching can take place in or out of the classroom, computers, and the Internet are the most important components of E-learning. E-learning is also known as the network-enabled transfer of skills and knowledge, in which education is delivered to a large number of recipients at the same or different times. Previously, it was not widely accepted because it was assumed that this system lacked the human element required for learning.

However, with the rapid advancement of technology and the advancement of learning systems, it is now widely accepted by the general public. The introduction of computers was the foundation of this revolution, and as we become more reliant on smartphones, tablets, and other mobile devices, these devices have come to play an important role in classroom learning. Electronic educational materials such as optical discs or pen drives are gradually replacing books. Knowledge can also be shared via the Internet, which is available 24 hours a day, seven days a week.

E-learning has proven to be the most effective method in the corporate sector, particularly when training programs are conducted by MNCs for professionals all over the world and employees are able to acquire important skills while sitting in a board room, or by holding seminars for employees of the same or different organizations under one roof. Schools that use E-learning technologies are a step ahead of those that continue to use the traditional approach to learning.

Without a doubt, it is equally important to advance the concept of non-electronic teaching through books and lectures, but the importance and effectiveness of technology-based learning cannot be underestimated or ignored entirely. It is thought that the human brain can easily remember and relate to what it sees and hears when watching or listening to moving pictures or videos. It has also been discovered that visuals, in addition to holding the student's attention, are retained by the brain for longer periods of time (Figure 6.2).

Figure 6.2. Agriculture, medicine, education, services, business, and government establishments are all adapting to the concept of E-learning, which aids in the advancement of a nation.

As many definitions of e-learning exist as there are educational scientists in the world. Let us look at some examples from various academic institutions and educational researchers to get a better understanding of the various academic definitions of e-learning.

Sarah Guri-Rosenbilt from the Open University of Israel explored the exact definition of e-learning in great detail in her 2005 research paper "'Distance Education' and 'E-Learning': Not the Same Thing." She defined e-learning as electronic media used for various learning purposes ranging from conventional classroom add-on functions to online substitution for face-to-face meetings with online encounters.

Clark and Mayer defined E-learning as instructions delivered through digital devices with the intent of supporting learning in their 2016 research paper "E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning."

Arkorful and Abaidoo defined e-learning as using information and communication technologies to for enabling access to online teaching and learning resources in their 2015 research paper "The role of e-learning, advantages, and disadvantages of its adoption in higher education."

Ruiz, Mintzer, and Leipzig defined e-learning as using Internet technologies for enhancing performance and knowledge in their 2006 research paper "The Impact of E-Learning in Medical Education."

Moving onto Internet resources, eLearningNC.gov has defined e-learning as learning by utilizing electronic technologies for accessing educational curriculums outside of traditional classrooms.

As it appears, answering the question of what is the definition of e-learning is not as easy as it might first seem. The differences between e-learning and distance learning are subtle but important, and it's important to make distinctions between the two.

6.2.2. E-Learning-Requisites to Be Provided Before Launching E-Learning Online

Simply putting existing courses and materials on a website does not constitute e-learning. Before launching e-learning online, the following needs must be fulfilled:

- Sufficient top-level support and funding are required to develop and implement e-learning;
- Managers and HR professionals must be persuaded to accept the concept of decentralized and individualized training;
- Current training methods (in comparison to e-learning) are not meeting organizational training needs adequately;
- Potential learners are computer literate and have ready access to computers and the internet;
- There are a sufficient number of learners, many of whom are self-motivated to direct their own learning.

6.3. TYPES OF E-LEARNING

There are four types of e-learning which are discussed in subsections (Figure 6.3).

Figure 6.3. Types of e-learning.

6.3.1. Informal Learning

A learner in this type accesses a website or a focused online community and finds relevant information. This type of e-learning is not training because

it lacks a formal instructional strategy that includes material presentation, application exercises, and feedback.

6.3.2. Self-Paced Learning

It is the process by which learners access computer-based training (CBT) or web-based training (WBT) materials at their own pace, typically via a CD-ROM for CBT or via a network or the Internet for WBT. Learners choose what they want to learn, when they want to learn it, and how quickly they want to learn it.

6.3.3. Leader-Led Learning

In contrast to self-paced learning, this type of e-learning is always accompanied by an instructor, coach, or facilitator. There are two types: (a) learners access real-time (synchronous) materials via videoconferencing or an audio or text messaging service, such as Internet chat, and (b) learners access delayed materials (asynchronous) via threaded discussions or streamed audio or video.

6.3.4. Performance Support Tools

This is a general concept for online materials that learners can access for assistance in performing a task, particularly one involving software. Typically, performance support tools guide the user through the steps required to complete a task.

6.4. ADVANTAGES AND DISADVANTAGES OF E-LEARNING

Learning in a classroom is more personal and dynamic, there are numerous advantages to taking an online course, and the most of them are related to convenience and affordability.

We all have access to the internet and use it for a variety of purposes, including researching material for school and college projects, downloading music, images, wallpapers, and screen savers, staying updated on global events, and communicating via email, instant messaging, and chats. However, did you know that the internet has another advantage, and that is the ability to learn? Yes! You can now educate yourself from the comfort of your own home and earn a degree entirely online. Even the unthinkable appears to be achievable now, thanks to advancements in technology.

The term "web-based learning" is frequently used interchangeably with "eLearning" or "online learning." It primarily entails learning online via online courses. Through the internet, email, live lectures, and videoconferencing are all feasible. This enables all parties to express their perspectives on a given subject and then discuss it further. Additionally, they provide static sites such as course materials that are printed for the convenience of all participants. One of the primary benefits of visiting web sites is that the majority of web pages contain hyperlinks that will take you to another page, therefore allowing you to access a great amount of information on the internet.

You lack the time necessary to attend classes at a university. Previously, this would have been a significant issue, since you would not have known how to manage it, but not now. With the numerous online courses accessible, you may truly learn while sitting at home. No more waking up early to attend classes or dealing with that vexing classmate. Now you can pursue whatever path you like in peace and at your leisure. A typical web-based course would include course information, a timetable, a bulletin board, a curriculum map, teaching materials such as articles, slides, and handouts, communication via discussion boards and email, summative, and formative assessments, student management tools such as statistics, records, and student tracking, and also links to extremely useful external and internal websites.

But besides the benefits, are there any limitations of this practice? Consider the advantages and disadvantages of E-learning.

6.4.1. Advantages of Online Learning

1. **Efficiency:** Online education enables teachers to give lessons to students in a more efficient manner. Online learning features a variety of tools, including videos, PDFs, and podcasts, which teachers can include into their lesson plans. By using internet resources into the lesson plan in addition to traditional textbooks, teachers can become more efficient educators.
2. **Accessibility of Time and Place:** Additionally, online education enables students to attend classes from any location. Additionally, it enables schools to reach out to a broader network of students, rather than being constrained by physical borders. Additionally, online lectures can be recorded, stored, and shared for reference purposes in the future. This enables students to access learning materials at their convenience. Thus, online education provides

students with the flexibility of time and place in their study.

3. **Economic Viability:** Another advantage of online education is the financial savings. Online education is far less expensive than traditional education. This is because online education reduces the costs associated with student transportation, meals, and, most significantly, real estate. Additionally, all course and study materials are available online, resulting in a paperless learning environment that is more inexpensive and environmentally friendly.
4. **Improved Student Attendance:** Because online classes may be attended from any location, including the student's home, there are less chances for students to miss sessions.
5. **Adapts to a Diverse Range of Learning Styles:** Each learner has a unique learning path and a unique learning style. While some students prefer to study visually, others prefer to learn through audio. Similarly, some students flourish in a classroom setting, while others are self-directed learners who are easily distracted by large groups.

With its variety of options and resources, the online learning system can be customized in a variety of ways. It is the most effective method for creating an ideal learning environment that is tailored to the unique needs of each learner.

6.4.2. Disadvantages of Online Learning

1. **Inability to Focus on Screens:** For many students, one of the most difficult aspects of online learning is the inability to maintain concentrate on the computer for extended periods of time. Additionally, online learning increases the likelihood that students may be easily sidetracked by social media or other websites. As a result, it is critical for professors to keep their online classes concise, engaging, and interactive in order to maintain students' attention on the subject.
2. **Technological Concerns:** Another significant obstacle to online education is internet connectivity. While internet coverage has increased dramatically over the last few years, maintaining a stable connection at a reasonable speed remains a challenge in smaller cities and villages. Without a regular internet connection

for kids or teachers, a child's learning may suffer from a lack of consistency. This is counterproductive to the educational process.

3. **Sense of Isolation:** Students can gain a great deal from being with their peers. However, in an online class, physical connections between students and lecturers are negligible. This frequently results in students feeling isolated. In this situation, it is critical for the school to provide alternative modes of communication for students, classmates, and teachers. This can include online messaging, email, and video conferencing, all of which facilitate face-to-face engagement and alleviate feelings of isolation.
4. **Teacher Training:** However, this is not always the case. Frequently, teachers lack a fundamental understanding of technology. Often, they lack the resources and technologies necessary to conduct online classes.

   To overcome this, schools must spend in training teachers on the latest technology advancements so they can conduct online lessons seamlessly.
5. **Manage Screen Time:** Many parents are concerned about the health risks associated with their children spending so much time glued to a screen. Increased screen time is one of the primary concerns and drawbacks of online education. Occasionally, pupils develop poor posture and other physical difficulties as a result of their prolonged hunching in front of a screen.

A good answer to this would be to provide students with frequent breaks from the screen in order to recharge their minds and bodies.

6.5. BENEFITS OF E-LEARNING FOR LEARNERS, INSTRUCTORS, AND MANAGERS

According to Brooke Broadbent, the following are the advantages of e-learning for learners:

- Facilitates understanding and memory of knowledge through interactions amongst learners during online discussions;
- Supports diverse learners and promotes learning through a variety of activities that utilize a variety of various learning styles;
- Encourages self-paced learning, allowing learners to progress at their own pace;

- Provides quick access to educational materials at any time and from any location;
- Decreases travel time and expenditures;
- Encourages learners to browse for information by providing links to World Wide Web sites;
- Enables learners to access targeted and relevant content on the Web;
- Utilizes performance support technologies to provide context-sensitive assistance;
- Fosters the development of technological skills necessary for Internet use;
- Inspires learners to take ownership of their education and fosters self-confidence.

According to Brooke Broadbent, the following are the advantages of e-learning for instructors:

- Provides educators with quick access at any time and from any location;
- Enables the pre-packaging of critical material for universal access, freeing teachers to focus on high-level activities during the delivery phase;
- Preserves discussion records and enables later referencing via a threaded discussion or streaming video;
- Increases teachers' personal fulfilment through high-quality e-learner participation;
- Saves money on travel and lodging expenses involved with training sessions;
- Encourages educators to utilize up-to-date online resources;
- Enables professors to communicate with students in a more engaging manner than is feasible with text-based remote education.

According to Brooke Broadbent, the following are the advantages of e-learning for managers:

- Automates and reports on employee participation and progress;
- Contributes to the reduction of capital expenses connected with traditional brick-and-mortar schools and training facilities;

- Lowers the cost of instructional materials, mailing, and telephone calls connected with distance education programs;
- Provides access to the same materials via a browser on a range of platforms, including Windows, UNIX, and Mac;
- Improves the consistency of the training program through the use of templates;
- Through training coordination software, establishes a one-stop shopping center for courses offered throughout the firm;
- Provides access to world-renowned instructors.

Not every e-learning process, application, or method is necessarily e-learning-exclusive. Occasionally, a hybrid learning system is used, combining remote e-learning with direct contact via nearby human educational resources, or combining software-driven resources with human intervention (whether remote or local, computer-mediated, such as via e-mail or chat, or non-computer-mediated, such as face-to-face or telephone, or combining software-driven resources with).

Technological advancements have facilitated the expansion of collaborative Web-based learning options. Asynchronous activities make use of technology such as blogs, wikis, and discussion boards to enable participants to contribute when their schedules permit. Synchronous activities involve the participation of all participants simultaneously, such as a changed session or a virtual classroom or meeting, such as those given by Web Ex, etc.

The debate over the effectiveness of educational technology (ET) in general, and the Internet in particular, continues. Numerous authors have emphasized the rising use of the Internet in education at all levels.

Increased connectivity and capabilities enabled by broadband technology, together with sustained investment in education by various governmental and corporate entities, promise to accelerate this trend.

However, research findings on its advantages are inconsistent. Fleming and Raptis (2000) undertook a topographical analysis of the ET literature and discovered that its efficiency is mostly unknown. Fabos and Young (1999) triumph by characterizing a large portion of the literature as 'contradictory, indecisive, and possibly misleading.'

According to Lawson and Comber (2000), experts are divided on the role that technology will play in education. One school of thought believes that technology will play an incremental function, while the other believes

that technology will play a transformational role. Their own research found that while technology and Internet connectivity have transformed some elements of education, they have only increased the efficiency of others.

Golian (2000) discusses the Internet's advantages and disadvantages as an educational tool. The advantages of online education include the following:

- The ability to learn at one's own pace;
- Accessibility;
- Active learning;
- Cost effectiveness for some activities;
- Collaborative learning;
- A personalized learning environment; and
- Non-linear learning.

The limitations include the following:

- Shifting the duty for searching to the learner;
- Data overload;
- Data unreliability;
- Network/hardware unreliability;
- Access control; and
- Application-oriented instruction rather than theory-oriented instruction.

Institutional, instructional, technological, and personal barriers to employing networked e-learning technologies have been classified. Financial support and incentive systems are examples of institutional restrictions. Time constraints and interpersonal contact are inherent in instructional challenges.

Technical barriers include equipment reliability and software adequacy. Finally, personal barriers include the learners and instructor's technology proficiency and attitudes toward acceptance. However, Piotrowski and Vodanovich (2000) discovered that research findings in these areas were ambiguous.

Numerous studies have been conducted to ascertain instructor attitudes toward technology and the Internet. Teachers have historically expressed a pessimistic opinion of computers' effectiveness in education. According to research, teachers' use of the Internet is related to their personal experience

with the Internet in particular and computers in general, as well as institutional support and training.

6.6. E-LEARNING-SUCCESS FACTORS FOR ORGANIZATIONS USING E-LEARNING

It is worth noting that institutions that use e-learning share some common success factors:

- A cultural shift has occurred in terms of how training and learning occur and are provided;
- E-learning is closely matched with the business's needs;
- E-learning is used in conjunction with other forms of training, such as classroom activities, and is not utilized in place of other activities entirely;
- Rather than the other way around, it is learning demands that drive technology;
- E-learning has continual support from high management and is actively promoted across the organization;
- A variety of individuals with a variety of abilities are involved, including expert trainers, facilitators, e-learning champions, and site and graphic designers.

As part of their e-learning strategy, businesses are increasingly utilizing web-seminars. Numerous human resource professionals are utilizing web-seminars to plan training sessions to ramp-up new lines of business and boost soft-skills, especially when dealing with globally scattered personnel.

Additionally, web seminars assist human resource executives in delivering new or updated business policies and managed employee information. Web seminars also enable remote employees to participate virtually in all meetings.

Web seminars assist in reducing trainer-trainee travel times and training expenditures; additionally, the trainer is able to concentrate on the training topic, impart more training programs on a consistent basis, and maintain. Training calendar, and global employee reach via e-mailed lesson notes prior to seminar training modules being recorded and used in the future. Apart from training, businesses utilize web seminars to build brand awareness, generate sales leads, and conduct press conferences.

6.7. E-LEARNING: A PANACEA IN THE TIME OF COVID-19 CRISIS

Corona Virus, also known as COVID-19, is a lethal and infectious disease that has had a significant impact on the global economy. This tragedy has also shook the education sector, and this fear is likely to reverberate throughout the world's education system. Numerous schools and colleges were forced to close temporarily due to the COVID-19 pandemic outbreak. Numerous areas are affected globally, and there is concern that this semester, and possibly more in the future, will be lost.

Numerous schools, colleges, and universities have eliminated face-to-face instruction. According to the researchers' assessment, it is unlikely that normal teaching will resume anytime soon. Due to the predominance of social distancing at this stage, this will have a detrimental effect on learning opportunities. Educational institutions are scrambling to find solutions to this perplexing situation. These circumstances highlight the critical importance of scenario planning for academic institutions (Rieley, 2020). This is a situation that necessitates humanity and cooperation. It is critical to safeguard and save our students, faculty, academic staff, communities, societies, and the nation as a whole.

Numerous arguments are made in favor of e-learning. Some of the arguments for online pedagogy include accessibility, affordability, flexibility, learning pedagogy, lifelong learning, and policy. According to some, online education is easily accessible and can even reach rural and remote areas. It is considered a more affordable mode of education due to the lower costs of transportation, accommodation, and the overall cost of institution-based education. Another intriguing aspect of online learning is its flexibility; a learner can schedule or plan their time for completing online courses. By combining face-to-face lectures with technology, blended learning and flipped classrooms are created; this type of learning environment can help students maximize their learning potential. Students can learn at any time and from any location, thereby developing new skills and establishing a foundation for lifelong learning. Additionally, the government recognizes the growing importance of online education in today's dynamic world.

The severe outbreak of Corona Virus disease adds another argument in favor of online learning, namely that it serves as a panacea during times of crisis.

6.7.1. Online Teaching Is No More an Option, It Is a Necessity

Due to the serious outbreak of this global pandemic COVID-19, the majority of the world is quarantined, and as a result, many cities have become phantom cities, with its effects visible in schools, colleges, and universities as well. Between all of this, online teaching and online learning can be referred to as the crisis's panacea. The Corona Virus compelled institutions to shift from analogue to digital pedagogy. This crisis will compel institutions that were previously resistant to change to embrace modern technology. This disaster will demonstrate the lucrative side of online education and learning. We can sermonize a large number of students at any time and from any location in the world using online teaching modes. All institutions must consider alternative online pedagogical approaches and make more effective use of technology. Numerous universities worldwide have fully digitalized their operations, recognizing the critical nature of the current situation. Online learning is emerging as a victor ludorum amidst this chaos. As a result, it is critical at this stage to improve the quality of online teaching-learning. After the COVID-19 outbreak, online education in Chinese universities increased exponentially. Normal classrooms have been transformed overnight into e-classrooms, implying that educators' entire pedagogical approach has shifted in order to address new market conditions and adapt to changing circumstances. During this difficult period, the question is not whether online teaching-learning methods can provide a high-quality education; rather, the question is how academic institutions will be able to adopt online learning in such a large scale (Carey, 2020).

Resisting change will benefit no educational institution on the planet. They will be evaluated on their ability to adapt quickly to changes and their ability to maintain a high level of quality. Educational institutions' reputations are on the line and being scrutinized. Their behavior and ability to maintain a high standard of education in the face of this crisis demonstrates their adaptability. The only viable solution is to move away from face-to-face lectures and toward online classes.

6.7.2. Problems Associated with Online Teaching and Learning

There are numerous technologies available for online education, but they can occasionally create a slew of complications. These difficulties and issues associated with modern technology range from downloading errors to installation issues, login issues, and audio and video problems, to name a few. Occasionally, students find online instruction to be tedious and

uninteresting. Online education requires so much time and flexibility that students never have enough time to complete it.

Personal attention is another significant issue confronting online education. Students desire two-way communication, which can be challenging to implement at times. The learning process cannot be fully realized until students apply what they have learned. Occasionally, online content is entirely theoretical and does not provide opportunities for students to practice and learn effectively. Course content is also a significant issue. Students believe that the absence of a sense of community, technical difficulties, and difficulty comprehending instructional objectives are the primary barriers to online learning (Song et al., 2004).

Students were found to be unprepared for balancing their work, family, and social lives with their academic lives in an online learning environment, according to a study. Additionally, students were found to be underprepared for a variety of e-learning and academic-type competencies. Additionally, there is a lack of preparedness on the part of students regarding the use of Learning Management Systems (Parkes et al., 2014).

6.7.3. Possible Resolutions to Issues

While there are numerous drawbacks to online education, we cannot ignore its benefits during times of crisis. We can always find solutions to these problems. Technical difficulties can be overcome by pre-recording video lectures, testing the content, and always having a backup plan in place to ensure that the teaching-learning process is not harmed. Courses delivered online should be dynamic, engaging, and interactive. Teachers should assign students time limits and reminders to keep them alert and attentive. Attempts should be made to humanize the educational process as much as possible. Students should receive individual attention to ensure that they adapt easily to this new learning environment. Students can be communicated with via social media and various group forums. When reaching out to students via texts, various messaging apps, and video calls, and so on becomes difficult, communication is critical—content should be designed to allow students to practice while also honing their skills. The quality of the courses should be continuously improved, and teachers should strive to provide the best possible instruction. Online programs should be innovative, interactive, relevant, student-centered, and group-based in nature (Partlow and Gibbs, 2003). Educators must devote a significant amount of time to developing effective strategies for delivering online instruction. Effective online

instructions encourage learners to provide feedback, elicit questions, and broaden the learner's horizons for the course content (Keeton, 2004). Through online instruction, institutions must prioritize pedagogical issues and emphasize collaborative learning, case-based learning, and project-based learning (Kim and Bonk, 2006).

The challenge for educational institutions is not only in acquiring new technology and implementing it, but also in reimagining education in order to assist students and academic staff in achieving digital literacy.

6.7.4. SWOC Analysis of Online Learning: During Corona Virus Pandemic and Other Crisis-Like Situation

Following natural disasters such as floods, cyclones, earthquakes, and hurricanes, knowledge delivery becomes a difficult task. These dangers wreak havoc on educational processes in schools and colleges in a variety of ways. Occasionally, this results in the closure of schools and colleges, which has serious consequences for students, deprives them of their fundamental right to education, and puts them at risk in the future. "Every year, natural disasters affect more than 100 million children and adolescents. The majority of them face disruptions to their education" (World Vision). Crises and conflicts are the greatest impediments to education. Numerous students and teachers also experience psychological distress during times of crisis—stress, fear, anxiety, depression, and insomnia, all of which contribute to a lack of focus and concentration. Disasters wreak havoc on people's lives (Di Pietro, 2017).

Changed weather patterns and rising global temperatures have resulted in an increasing number of extreme weather events becoming the new normal. These occurrences resulted in varying degrees of loss of life and property. Table 6.1 summarizes several natural disasters that wreaked havoc on educational processes. Numerous schools and colleges were destroyed, affecting thousands of students. Their education was interrupted in the middle. "When education is disrupted, children become vulnerable to child labor, early marriage, exploitation, and recruitment into the armed forces" (Baytiyeh, 2018). When disasters and crises (both man-made and natural) strike, schools, and colleges must be resilient and creative in resuming teaching-learning activities (Chang-Richards et al., 2013).

For example, in 2016, Italy was struck by three powerful earthquakes. This resulted in widespread devastation in a variety of areas. Around 1,00,000 people were displaced, buildings, and structures collapsed, and significant

loss of life and property occurred. The University of Camerino, one of the world's oldest universities, suffered a devastating loss. The university was in a state of crisis; its structure had collapsed, leaving a large number of students homeless and others fleeing. Students were deprived of education and learning in such circumstances. It is true that "it is difficult to remain on the traditional path when the path has crumbled." This means that face-to-face instruction was not possible at the time; as a result, management, and leaders came up with some strategies for sustaining educational processes. Prior to the earthquake, e-learning at the University was inefficient. However, they were unstoppable, and they used Cisco's Webex (an online tool) to continue the teaching-learning processes. Webex aided professors in developing their instructional programs and collaborating with students on notes and presentations. The university became proficient in e-learning strategies and techniques in less than a month. They successfully integrated themselves into the world of e-learning. They believed that while the value of face-to-face instruction cannot be diminished, e-learning can be used in conjunction with traditional methods to increase efficiency, effectiveness, and competitive edge through the provision of quality education (Barboni, 2019).

In February 2011, Christchurch was shaking by a 6.3 magnitude earthquake, and the University of Canterbury collapsed. The university's operations were restarted and given a second chance through the use of information technology and online education (Todorova and Bjorn-Andersen, 2011).

Southern University in New Orleans converted to an e-learning campus following the devastation caused by Hurricane. Numerous online courses were offered, and mobile devices were used to educate displaced students (Omar et al., 2008).

And the most recent disaster comes in the form of the COVID-19 virus, which is spreading across the globe like a forest fire. All schools, colleges, and universities in the most affected areas have been placed on lockdown to prevent the spread of the Corona Virus. Numerous academic institutions are thus turning to online learning to ensure that teaching and learning processes are not harmed. Figure 6.4 depicts the SWOC Analysis of Online Learning.

E-learning has gained popularity over the last few years. Numerous platforms offer students affordable courses via Massive Open Online Courses. Many institutions remained averse to online teaching and learning. The challenges posed by the Corona Virus pandemic, on the other hand,

introduced everyone to a new world of online education and remote teaching. Instructors enticed them with remote teaching via a variety of flatforms, including Google Hangouts, Skype, Adobe Connect, and Microsoft Teams, though ZOOM emerged as the clear winner. Additionally, to ensure the smooth operation of teaching-learning programs, students were provided with a list of online etiquette guidelines and proper instructions for attending classes (Saxena, 2020).

Table 6.1. An Overview of Natural Disaster That Affected Teaching-Learning Badly

Year	Natural Disasters
2009	A violent earthquake in 9 the city of L'Aquila
2010	Floods in Pakistan
2011	Tropical storm Washi in the Philippines
2011	A series of earthquakes in New Zealand
2013	Tropical storm Haiyan in the Philippines
2015	Gorkha floods in Nepal
2017	Harvey and Irma Hurricanes in the United States
2017	Floods in Nepal, Bangladesh, and India
2018	An earthquake in Papua New Guinea
2018	Earthquakes and tsunamis in Indonesia
2019	The typhoon Lekima in China
2019	The typhoon Hagibis in Japan
2019	The tropical cyclone Idai in Southeastern Africa
2019	The heat wave in Bihar

Source: Save the Children (2014, 2017), US News and Word Report, and Briggs, 2018.

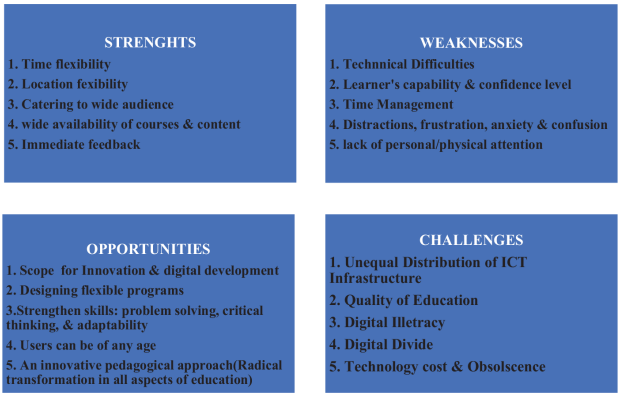

Figure 6.4. SWOC analysis.

Source: https://journals.sagepub.com/na101/home/literatum/publisher/sage/journals/content/etsa/2020/etsa_49_1/0047239520934018/20200729/images/medium/10.1177_0047239520934018-fig1.gif.

6.7.4.1. Strengths

The methods and processes used in e-learning are extremely effective. These advantages of online learning can help us through these trying times. It is student-centered and provides significant scheduling and location flexibility. We can tailor our procedures and processes to the learners' needs through the use of e-learning methods. Numerous online tools are available, which is critical for creating an effective and efficient learning environment. Educators can use a combination of audio, video, and text to communicate with their students during this time of crisis, ensuring that their lectures retain a human touch. This can aid in the development of a collaborative and interactive learning environment in which students can provide immediate feedback, pose questions, and learn in an engaging manner. The Anywhere-Anytime feature of e-learning is advantageous in the times of crisis-like situation, for example, man-made disasters, natural disasters, or pandemics such as COVID-19. While closures of places and unsafe road travel can create a slew of problems, e-learning ensures that we do not lose access to education at our homes or places of employment.

In times of crisis, technology enables people to communicate and even work virtually without the need for face-to-face interaction. This results in numerous system changes within organizations as they adopt new technology for communication and collaboration (Mark and Semaan, 2008).

6.7.4.2. Weaknesses

E-learning has some drawbacks in that it can obstruct communication between the learner and educator, i.e., direct communication and human contact are lost. Numerous technical difficulties can obstruct and slow down the teaching-learning process (Favale et al., 2020). While time and location flexibility are a strength of online education, they are also fragile and cause problems. Students' irresponsible behavior in terms of time and flexibility can create a slew of complications. Each student and learner are unique; they vary in terms of their capabilities and level of confidence. Certain individuals do not feel at ease while learning online, which results in increased frustration and confusion. Inadequate compatibility between the technology's design and the psychological components required for the learning process; and insufficient customization of learning processes can obstruct the teaching process and create an imbalance.

6.7.4.3. Opportunities

While online learning generally offers a plethora of opportunities, this time of crisis will enable online learning to flourish, as the majority of academic institutions have shifted to this model. Online education, remote work, and e-collaborations exploded in popularity during the Corona Virus outbreak crisis (Favale et al., 2020). Academic institutions can now seize this opportunity by requiring teachers to teach and students to learn online. The human race has always been complacent and has never experimented with novel modes of learning. This crisis will usher in a new era of online education, allowing people to consider the positive aspects of e-learning technologies. This is an exciting time to introduce surprising innovations and digital developments. Already, EdTech companies are contributing to the fight against the pandemic by ensuring that learning does not come to a halt. Teachers can utilize technology and create a variety of flexible programs to aid students in their comprehension. The use of online learning will put both educators and students to the test. It will help students develop their problem-solving abilities, critical thinking abilities, and adaptability. In this critical situation, users of any age can access online tools and reap the benefits of online learning's time and location flexibility. In this panicky situation, which is now referred to as Panicgogy, teachers can develop novel pedagogical approaches. EdTech startups have numerous opportunities to revolutionize nearly every aspect of education, including teaching, learning, evaluation, assessment, results, certification, and degrees. Additionally,

growing market demand for e-learning presents an incredible opportunity for EdTech start-ups to disrupt the education sector through technological disruption.

6.7.4.4. Challenges

Online education faces a variety of challenges, including issues relating to learners, educators, and content. Engaging students and involving them in the teaching-learning process is a challenge for institutions. Teachers face difficulties transitioning from offline to online mode, altering their teaching methodologies and managing their time. It is difficult to create content that not only meets the curriculum requirements but also engages students (Kebritchi et al., 2017). The quality of online learning programs is a significant issue. The government makes no explicit reference to e-learning programs in its educational policies. There is a dearth of standards for quality assurance, quality control, the development of electronic resources, and the delivery of electronic content. This issue must be addressed immediately so that everyone can benefit from the benefits of high-quality education delivered via e-learning (Cojocariu et al., 2014). One should not only consider the benefits of online learning during times of crisis, but should also consider developing and improving the quality of virtual courses delivered during such times (Affouneh et al., 2020). E-learning requires a significant investment of time and money. It is not as simple as it appears; significant investment is required to acquire devices and equipment, maintain the equipment, train human resources, and develop online content. As a result, an effective and efficient educational system for online education must be developed.

In these trying times, ensuring digital equity is critical. Not all teachers and students have access to all types of digital devices, the internet, and wireless networks. Inadequate digital tools, no internet connections, or spotty Wi-Fi connections can create a slew of problems, resulting in many students missing out on learning opportunities. Institutions should make every effort to ensure that all students and faculty have access to necessary resources. Additionally, they must ensure that all educational apps work on mobile devices in the event that students do not have laptops. As a result, measures must be taken to close the digital divide.

The proverb "practice makes perfect" is a well-known and very true one. Students and faculty at numerous universities have never truly engaged in e-learning. The majority of them are complacent and reliant on traditional modes of instruction. The Corona Virus outbreak provides an opportunity

to make the best of a bad situation. We can learn a great deal from this trying situation. There are numerous tools available; teachers must select the best tool and use it to impart education to their students. Academic institutions can develop a step-by-step guide to instruct teachers and students on how to access and use various e-learning tools, as well as how to cover major curriculum content using these technologies, thereby reducing digital illiteracy. Teachers can present curriculum materials in a variety of formats, including videos, audios, and text. It is advantageous for educators to supplement their lectures with video chats, virtual meetings, and similar activities in order to receive immediate feedback and maintain a personal connection with their students.

6.8. VIRTUAL CLASSROOMS

Today's instructors use virtual classrooms to imitate a centuries-old practice: teaching exactly as they did in a traditional classroom. In most circumstances, this is precisely what learners anticipate, resulting in a vicious circle of virtual classroom utilization. Although the technology exists to enable virtual classrooms to expand beyond traditional (face-to-face) educational settings and to incorporate practices that are not possible in a traditional classroom, this is not yet the case, and it will likely take several more years for the practice to become widespread. This predicament occurs frequently when a new technology is introduced into a field with long-established procedures and traditions. For instance, the film business has taken a similar approach. While the film industry began in 1890, all pioneer films copied a kind of entertainment that people (audience and actors) were familiar with centuries ago: theatre. As a result, the initial films were shot with stage bound cameras, the performers performed what they were best at prior to filming, acting on stage, and the scenes were supposed to follow a linear chronological sequence.

6.8.1. Virtual Classrooms for E-Learning

Chambers proposed in 1980 that distance learning experiments be performed in a way that would permit in-house learning for some educational materials. In 1986, Hiltz coined the phrase "virtual classroom" to refer to the usage of a computerized conference system as a "virtual classroom." Early implementations of virtual classrooms concentrated on practical difficulties such as audio and video, as well as the use of a "pencil" for the whiteboard, while the primary issues cited were restricted bandwidth and a

lack of "turn-taking." As video conferencing technology matured, a plethora of online synchronous applications for learning arose, providing options for virtual classrooms. The majority of environments included real-time audio and video, a whiteboard, a slide presentation, text-based interaction, and a mechanism for learners to provide feedback.

The usage of virtual classrooms was initially motivated by need, most notably in the context of synchronous distance learning, in which a professor was required to replicate a conventional classroom environment for remote students. The primary objective in these early examples was to provide students with an experience comparable to that of a face-to-face classroom. This was frequently unsuccessful due to network and equipment restrictions that resulted in audio and visual issues, as well as a lack of appropriate tools (i.e., a discussion administration feature). As new environments began to incorporate additional capabilities, leaving sound and video concerns behind, a greater emphasis was placed on the environment's quality and usability.

Virtual classrooms were not just for distance learners; they could also be used for blended learning or as a supplement to on-campus courses. Nowadays, synchronous communication between distant learners inside a virtual classroom may be utilized to enhance personal participation, increase arousal and motivation, and assist students in forming a learning community and avoiding alienation, which is inversely connected to classroom community. Collaboration-based assignments in virtual classroom groups improve both the efficiency of the learning process and student skills. There are a range of features available in contemporary virtual classroom environments that can be used to not only replicate a traditional classroom, but also to transcend its boundaries.

6.8.2. Why Is It Important?

Today's virtual classrooms are online venues that have certain characteristics with traditional brick-and-mortar classrooms but are fundamentally different.

A virtual classroom setting facilitates human interaction, a critical component of classroom instruction that video-on-demand courses lack and badly miss. Teachers interact with students in real time in a virtual classroom; students can ask questions and communicate with peers in the same way they would in a traditional classroom, although through the internet.

Additionally, virtual classrooms are scalable, meaning they can handle a higher number of students. Physical classrooms frequently have a

maximum seating capacity to ensure that students can sit comfortably and have sufficient space to themselves. By contrast, virtual classrooms make use of virtual meeting solutions with a bigger capacity, allowing for the simultaneous attendance of more students in exciting classes. This results in increased participation rates and makes knowledge more accessible.

Virtual classrooms, like brick-and-mortar classrooms, are synchronous, with learners and teachers appearing online simultaneously to encourage quick interactions. However, virtual classrooms, like offline classrooms, make use of pre-recorded components such as films, presentations, and lecture slides to enhance learning.

A virtual classroom includes the following features:

1. **Video Conferencing:** Utilizing the best online conferencing software to facilitate communication between learners, teachers, and other learners.
2. **Digital Whiteboards:** Providing interactive demos and diagrams in real time.
3. **Instant Messaging:** Enables typed chats over low-bandwidth connections.
4. **Controls for Participation:** Allowing students to take part in debates, muffle their surroundings, or digitally "raise" their hands.
5. **Sub-Chats:** Breakout rooms to made the transition between learners.
6. **Video Recording:** To save recorded lectures as video-on-demand for later reference.
7. **End-to-End Encryption:** To ensure that access to the virtual classroom is limited to authorized learners.

6.8.3. Types of Learner-Friendly Virtual Classrooms

Virtual classrooms can be customized to fit the purpose for which they are being used. They can be used as an add-on to a course or as the foundation for a full course; virtual classrooms are highly configurable in either case.

1. **Enriched Virtual Type:** The majority of the course is conducted online, with the exception of a few offline components to supplement courses and curricula. These components are frequently delivered in the form of face-to-face sessions with

professors or collaborative discussions with peers to discuss a major assignment or thesis.

2. **Type of Rotation:** Rotation is frequently used in conjunction with the flipped classroom technique. It entails employing both virtual and offline classrooms alternately according to a timetable. Often, primary learning occurs online, with in-person interactions serving as a means of reinforcement and evaluation.
3. **Fully Online Type:** As the name implies, a completely online classroom does not require or permit offline face-to-face interactions. These courses may be synchronous or asynchronous in nature, relying mostly on pre-recorded videos and minimal live interaction via online meeting software.
4. **Flexible Type:** In this configuration, the virtual classroom remains open and accessible to students at their convenience. Otherwise, small group learning is encouraged, with the virtual classroom serving as a resource in case of questions.
5. **Mix-and-Match Type:** As the name implies, this model enables students to choose the method that works best for them in order to maximize their information acquisition. It is a hybrid of digital teaching models that can be student- or institution-led.

6.8.4. Why Are Virtual Classrooms Critical for Democratizing Learning?

Virtual classrooms level the educational playing field by enabling students from all around the world to access engaging courses regardless of their residence or place of employment. Virtual classrooms can be utilized in conjunction with current educational frameworks or as the primary vehicle for transferring knowledge.

Virtual classrooms promote inclusive and democratic learning while also assisting in the cost reduction of highly sought-after educational courses and certificates. And, given that traditional classrooms have been shuttered for the foreseeable future throughout the world, virtual classrooms and online virtual meeting platforms ensure that education continues, albeit online and at home.

6.8.5. Advantages of Virtual Classrooms Over Brick-and-Mortar Setups

1. **High Interactivity:** A successful virtual classroom makes excellent use of numerous modes of communication, including online virtual meeting software, chat rooms, texting, voice calls, and conferencing possibilities. This is to ensure that learners with diverse preferences benefit equally.
2. **Collaborative Education:** Collaboration between students is facilitated via digital whiteboards, file sharing, virtual meeting software, and chats. This simulates the real-time ambience of classrooms without the need to physically meet; it also reinforces previously learned content, resulting in increased knowledge retention.
3. **Instruction That is Centered on the Student:** Virtual classrooms, in contrast to pre-recorded videos, place a premium on students and their real-time education. Students can ask questions, clarify concepts, and engage in real-time discussion.
4. **Range of Content Types:** Virtual classrooms make use of a number of media formats to present information in order to accommodate a range of student skills and learning styles. There are several types of content available, including movies, presentations, SlideShare, animations, digital whiteboards, and webinars.
5. **Comfortable Learning Space:** Virtual classrooms make online education feel significantly less robotic. Human connection is vital to an educational system's success; virtual classrooms ensure that learners can engage and speak freely with peers and teachers.

6.8.6. What to Look Out for in a Virtual Classroom to Facilitate Better Learning

Virtual classrooms and the best virtual meeting software include both essential and optional features. The former is a requirement, so here are some things to keep an eye out for:

1. **Real-Time Instant Messaging:** Every virtual classroom must include messaging capabilities in order to accommodate lower bandwidths without jeopardizing communication. Learners must

be able to communicate with their instructors and peers and resolve minor misunderstandings that do not require video or voice calls.

2. **Video Chat of the Highest Quality:** This option maintains a sense of human connection and ensures that students receive attention. It is possible to implement it via a convenient video conferencing app for iOS and Android.
3. **Video Streaming:** This is a critical feature for classrooms that host hundreds of students from around the world. Certain enterprise virtual meeting solutions are designed for smaller groups; a virtual classroom, on the other hand, requires a much more powerful solution, such as video streaming.
4. **Secure File Sharing:** A two-way sharing system that is integrated is critical for virtual classrooms. It enables seamless collaboration and enables the sharing of assignments, reports, and projects within the learning environment via a single platform.
5. **Whiteboard Digital:** Digital whiteboards make it easier to display content, annotate it, and provide more vivid explanations. Additionally, these can be used by students presenting a project or thesis to their class or instructor. Touchscreen devices are optimal for digital whiteboards.
6. **Third-Party Integration:** Certain virtual classrooms may require additional features, as even the best video conferencing software does not have everything. Integrating third parties seamlessly enables knowledge providers to leverage the existing system and expand its use for the benefit of students.
7. **Student Groups:** A distinct group for students enables bonding over academic and non-academic subjects, a critical feature of traditional classrooms. They foster friendship and a sense of community; they also serve as a meeting space for students to discuss classes, topics, and interesting concepts.

Chapter 7

Distance Education

CONTENTS

7.1. Introduction 196
7.2. What Do We Mean by Distance Education? 196
7.3. Defining Distance Education 199
7.4. Distance Education: Generations 201
7.5. Key Concepts and Trends in Distance Education 205
7.6. Learner in Distance Education 216
7.7. Culture in Distance Education 217
7.8. Advantages and Disadvantages of Distance Learning 220
7.9. Distance Education: The Future 223

7.1. INTRODUCTION

Distance education has evolved into a popular and widely used mode of education in the 21st century. Distance education has taken on a variety of forms and has been defined in a variety of ways depending on the era in which it was developed. Age-appropriate technologies and pedagogies, as well as societal circumstances, have shaped how distance education is viewed and practiced, paving the way for successive generations of distance education. Distinct distance education concepts, pedagogies, and practices have also emerged over the course of the 19th century. However, it is true that distance education will soon supplant traditional education.

Distance education can be defined as, as we see it, a mode of delivering educational topics via a secondary media to learners at home or in distant locations via phone, tablet, television, internet, CD-ROM, apps, handouts-worksheets, and audio devices, among others, a mode of delivering educational topics via a secondary media to learners at home or in distant locations via phone, tablet, television, internet, CD-ROM, apps, handouts-worksheets, and audio devices.

Distance education, with all of its advantages and disadvantages, is critical in the aftermath of emergencies and in more normal circumstances. As amicable theories and approaches to distance education have yet to evolve significantly, enthusiasts worldwide are now attempting to define distance education from their own unique perspective. This chapter will lay the groundwork for a comprehensive reading of distance education's fundamental concepts. It will assess existing distance education facilities and attempt to close the gap created by the absence of a coordinated effort to present distance education to young researchers. This chapter will make several recommendations regarding critical issues that must be addressed in order to further the development of distance education.

7.2. WHAT DO WE MEAN BY DISTANCE EDUCATION?

Correspondence education, distance education, open education, online education, and E-learning are all terms that have evolved to describe off-campus education, with the term "off-campus" being phased out in favor of "e-campus" (Figure 7.1).

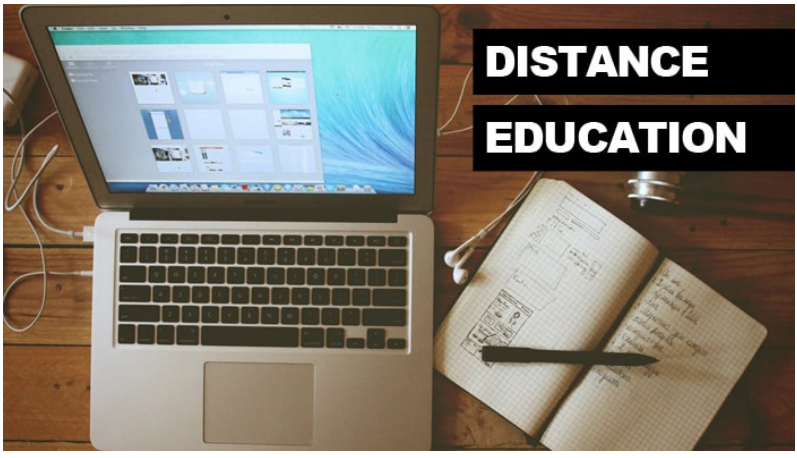

Figure 7.1. Distance education is now available online, on-demand, and to anyone.

Source: https://getcourse.com.au/wp-content/uploads/2017/06/distance-education.jpg.

Distance education has a charming presentation style, and it is one of the most influential modes of education that has brought about revolutionary change in the way we used to teach in classrooms. The traditional classroom setting has been supplanted by a virtual classroom in which you can raise your hand (ZOOM) and receive an immediate response.

With the turn of the 21st century, open, and distance learning took on new life, with an increasing number of courses delivered via distance education models worldwide. The impact of new media, particularly the use of digital connective technologies to deliver courses remotely, has sparked renewed interest in open and distance learning opportunities, including the advent of Open Education Resources (OER) and Massive Online Open Courses (MOOCs) that aim to expand access to education. Despite the renewed interest, distance education dates all the way back to the 1800s, when a Swedish newspaper advertised an opportunity to study "Composition via the Post" (Simonson, Smaldino, and Zvacek, 2015). Similar attempts to deliver education via distance in the same century include Isaac Pitman's of Britain's shorthand instruction via correspondence (Aydn, 2011).

Skerry's College in Edinburgh, University Correspondence College in London, and the University of Chicago and Illinois Wesleyan University in the United States of America are considered pioneers of the tertiary level

in the 19th century (Simonson et al., 2015). Prior to these early attempts at distance education, education was generally viewed as an elite endeavor undertaken by primarily male citizens. In the 19th century, the school model, which brought subject area experts (teachers) and students together spatially and temporally, was considered the most effective teaching and learning scheme, and it continues to be the dominant educational model today.

One of the primary reasons for the development of distance education was to ensure equal access to education for members of society who are not members of the elite and thus lack the opportunity and resources to attend an educational institution on-campus. Additionally, distance education holds the promise of delivering education to underrepresented and disadvantaged segments of society, ensuring that a broader audience has equal access to education. As a result, distance education is viewed as a more democratic form of education, as it aims to reach out to all segments of society (Gunawardena and McIsaac, 2004).

However, distance education practices have been criticized as being of lower quality and effectiveness than campus-based education; these criticisms persist today, despite the fact that research papers consistently find no significant difference in terms of learning effectiveness and quality between distance and campus-based courses (Ni, 2013; Shanley, Thompson, Leuchner, and Zhao, 2004). Nevertheless, some studies conclude that distance education is more effective than traditional campus-based education (Shachar and Neumann, 2003).

Distance education has been engineered and reengineered in response to society's technological and social changes. Additionally, the practices, philosophies, and cultures of those attempting and developing open and distance education have influenced its design and delivery. Thus, the philosophical, epistemological, and pedagogical foundations adopted, as well as the technologies used, all influenced the design and delivery of distance education courses. Each generation of distance education has evolved in accordance with the pedagogical foundations and technological advancements of its time. It is common sense to maintain a balance of pedagogy and technology in distance education endeavors, as distance education is heavily reliant on communication technologies to bridge the geographical and temporal divide between learners, instructors, and learning resources. Each generation of distance education has seen a convergence of technology and pedagogy. Whereas some distance education experts have emphasized pedagogy as the primary driver and technology as a support,

others have emphasized technology as the primary driver, directing the educational experience.

Anderson (2003) proposes a compromise between pedagogical and technological determinism, arguing that both can be viewed as partners in a dance performance; while technology provides the music and beat, pedagogy provides the cerography. A Learning Management System that views the world as a series of courses and content will necessitate the development of corresponding pedagogies, while rejecting any pedagogy that lacks a strong focus on content. On the other hand, technological innovations that enable the incorporation of diverse learning models have an effect on the types of pedagogical models that can be developed. For example, the absence of two-way communication technologies will make it more difficult to implement a pedagogical model based on social constructivist pedagogies, which rely on communication and interaction between learning parties.

7.3. DEFINING DISTANCE EDUCATION

The authors used a variety of alternative terms for distance education, including open learning, open teaching, non-traditional education, correspondence education, independent study, home study, extension study, external study, external learning, flexible education, flexible learning, life-long education, lifelong learning, contract learning, and experiential learning.

Correspondence education is "conducted by postal services in the absence of face-to-face interaction between teacher and student." Teaching is accomplished through the use of written or taped materials, as well as through the submission of written or taped exercises to the teacher, who then corrects and returns them to the learner with criticisms and advice (Titmus, Buttedahl, Ironside, and Lengrand, 1979 in King, Young, Drivere-Richmond, and Schrader, 2001).

Dohmen (1967), a former director of the German Distance Education Institute (DIFF), defined distance education as "a systematic organized form of self-study in which student counselling, presentation of learning materials, and ensuring and supervising students' success are all carried out by a team of teachers, each of whom has distinct responsibilities." This type of self-study is made possible at a distance via media capable of covering great distances. The polar opposite of 'distance education' is 'direct education' or 'face-to-face education, a form of education in which lecturers and students interact directly (ibid.).

Peters (1973) defines DE as follows: "Distance education/teaching (Fernunterricht) is a method of imparting knowledge, skills, and attitudes that is rationalized by the application of division of labor and organizational principles, as well as by the extensive use of technical media, particularly for the purpose of reproducing high-quality teaching material that enables great distance instruction. It is a mechanized method of teaching and learning" (ibid.).

Moore (1973) defines distance teaching as "the family of instructional methods in which teaching behaviors are separated from learning behaviors, including those that, in a contiguous situation, would be performed in the learner's presence, so that communication between the teacher and the learner must be facilitated through print, electronic, mechanical, or other decentralized means" (ibid.).

Holmberg (1977) defined distance education/teaching as "a method of imparting knowledge, skills, and attitudes that is rationalized by the application of division of labor and organizational principles, as well as by the extensive use of technical media, particularly for the purpose of reproducing high-quality teaching materials that enables the simultaneous instruction of large numbers of students." It is again a mechanized method of teaching and learning (ibid.).

According to Garrison and Shale (1987), "distance education" implies that majority of educational communication between the teacher and student(s) takes place in a non-contiguous manner. It must involve bidirectional communication between the teacher and the student(s) in order to facilitate and support the educational process. It makes use of technology to facilitate the necessary two-way communication (ibid.).

Barker and Patrick (1989) define DE in terms of the advancement of telecommunication technologies. According to them, "telecommunications-based distance education approaches transcend the boundaries of correspondence study." Both the instructor and the student(s) experience the teaching-learning process concurrently-it is contiguous in time. When an audio and/or video communication link is used, it is possible to conduct real-time teacher-student exchanges, allowing for immediate responses to student inquiries and comments. Much like in a traditional classroom setting, students can seek clarification from the speaker on the spot (ibid.).

Moore (1990) provided another definition of DE, stating that it "includes all arrangements for providing instruction via print or electronic communications media to a person engaged in planned learning who is

located in a different location or time zone than the instructor or instructors" (ibid.).

Moore and Kearsley (1996) define distance education as "planned learning that typically takes place in a different location and requires a well-defined system of delivery that incorporates modified teaching techniques, alternative modes of communication, including but not limited to technology, as well as alternative administrative and organizational components" (ibid.).

UNESCO (2002) defines distance education as follows: "Distance education is any educational process in which all or most of the teaching is conducted by someone who is physically and/or chronologically distant from the learner, with the result that all or most of the communication between teachers and students takes place via an artificial medium, either electronic or print" (ibid.). Schlosser and Simonson (2009) define distance education as "institution-based, formal education in which the learning group is divided and interactive telecommunications systems are used to connect learners, resources, and instructors" (ibid.).

Moore and Kearsley (2011) defined distance education as "teaching and planned learning in which the teaching takes place in a location distinct from the learning, requiring communication via technology and a unique institutional organization" (ibid.). According to Shale (1988), distance education entails an interesting paradox in that it asserts its existence but is unable to identify itself. As indicated by the definitions above, the term "distance education" is a generic, umbrella term that can be used interchangeably with other similar terms (ibid.).

7.4. DISTANCE EDUCATION: GENERATIONS

Through the generations, the concept of distance education has evolved to include correspondence, broadcasting, and computer-mediated distance education (Anderson and Simpson, 2012). The first generation of distance education was dominated by print technology. The widespread use of a basic communication system, the postal service, enabled education to extend beyond the physical boundaries of university campuses (Caruth and Caruth, 2013). A variety of organizations have adopted correspondence education to promote a sense of social justice and equal opportunity (Figure 7.2) (Simonson et al., 2015).

Figure 7.2. Distance education in the first generation sought to broaden the scope of education by including those who were less fortunate and lacked access to educational resources and institutions (Anderson and Simpson, 2012).

Source: https://th.bing.com/th/id/R.bc44b747bd282b97c42451aa34852961?rik=s72tRbftbwT91w&riu=http%3a%2f%2flebanon.k12.or.us%2fmedia%2f2020%2f04%2fdistance-learning.jpg&ehk=REbrRYfVW91VY59CtfzAi6GX%2bXxCR82YK8ku%2fp4O7%2bk%3d&risl=&pid=ImgRaw&r=0.

Due to the limited two-way communication capabilities inherited from the era's technology, this first generation of distance education was dominated by behaviorist theories of learning. Holmberg's (1983) didactic teaching style, dubbed "guided didactic conversation," helped shape the landscape of distance education's first generation. Otto Peters was another influential theorist who shifted the focus of distance education toward its organization and delivery (Peters, 1983).

Peters' industrialized education theory emphasized the division of labor involved in mass production and delivery of educational materials. Although there were no journals devoted to distance education during the first generation of distance educators, the first generation of distance educators witnessed the birth of distance education research (Anderson and Simpson, 2012).

The second generation of distance education was primarily driven by radio and television broadcast technologies. Although these broadcast technologies created new opportunities for interaction, teacher-student

interaction was kept to a minimum (Anderson and Simpson, 2012). The Open University in the United Kingdom (UKOU) was a model distance education institution during this period due to its effective use of television. Enabling access to education remained the primary motivation for distance education (Anderson and Simpson, 2012). However, there was a significant increase in scholarly and research work in second generation distance education, which resulted in the establishment of research centers, journals, conferences, and associations dedicated to distance education (Anderson and Simpson, 2012).

Distance education providers were swayed by the concept of economies of scale, and mega distance teaching universities such as Anadolu University in Turkey and Indira Gandhi National Open University in India grew in size and enrollment. Distance education materials for the second generation were developed around one-way communication facilitated by the instructor. Learning was defined as an individual activity, and theories of learning were based on cognitive or behavioral theories (Anderson and Simpson, 2012).

Distance education has always been mediated through the use of technology, and the distance education landscape has been defined and shaped by technology. The greater the affordances inherited by newer technologies, the greater the possibilities and opportunities for distance education delivery. The next generation of distance education was propelled forward by two-way communication technologies such as audio/video conferencing and synchronous and asynchronous computer-mediated communication (CMC). Increased opportunities for interaction resulted in the third generation's recognition of the value of interaction in distance education courses (Anderson and Simpson, 2012). Similarly, the impact of digital technologies and the expanded communication possibilities they enable has consolidated the value placed on interaction. These technologies have shifted the emphasis away from organization and didactic instruction and toward the social construction of knowledge (Anderson and Simpson, 2012), which fits both social constructivist and connectivism theories of learning. Recent developments continue to reflect the primary motivation for the development of distance education practices: to promote social justice and equality of opportunity for all. The "open" movement's impact on education, as reflected in OER and MOOCs, are examples of such new developments that are facilitated by the affordances of connected technologies. Individualization of learning is enabled by data mining and learning analytics (LA). Additionally, the pervasiveness of mobile technologies enables anytime, anywhere learning (Anderson and Simpson,

2012). The aforementioned innovations continue to reshape the landscape of distance education by introducing novel learning experiences and paradigms. These developments are also reflected in distance education's theoretical foundations and research.

Bozkurt et al. (2015) conducted a systematic review of research articles published between 2009 and 2013. They discovered that theories of learning that emphasize the impact of community and network, collaboration, and cooperation, as well as higher order skills concepts such as critical thinking and problem solving, are among the most frequently used theoretical frameworks in distance education research (p. 344). Additionally, they report that emerging trends in delivery methods such as blended learning and mobile learning that incorporate multimedia elements such as cognitive load theory. Psychological distance (transactional distance theory), social presence theory, and learner dedication (self-regulated learning, self-directed learning, and motivation theory) are all significant emerging constructs. Their findings indicate that no single theory is overwhelmingly representative of distance education practices, which is consistent with the field's interdisciplinary nature (Bozkurt et al., 2015).

Bozkurt et al. (2015) also highlight a paradigm shift in distance education to reflect the "open" trend. They point out that the generic term for the field, "distance education," is no longer the sole descriptor. The term "open and distance learning" has been used more frequently in recent years to refer to a shift toward a more social and learner-centered view of education that embraces openness for the sake of social equity. Additionally, Bozkurt et al. (2015) conclude in their research that distance education research indicates that the field responds to emerging research topics, with "learning" being the primary focus. Apart from pedagogical concepts such as interaction and communication within learning communities, learner characteristics, and instructional design (Bozkurt et al., 2015), distance education research continues to focus on issues such as staff development (Feng, Lu, and Yao, 2015; Owusu, Anyan, and Denkyi, 2015), universal design, and disability accommodation (Barnard-Brak, Paton, and Sulak, 2012; Catal, 2012; Nworie, 2012; Olivier, 2014). It is clear that the future of distance education will be shaped by informal, nonformal, and formal learning environments.

To further the original goal of distance education, social equity, and openness for all, and to reflect community-based and socially driven approaches to learning, it appears that the field of distance education (or open

and distance learning) will see an increase in the use of open educational resources (OERs) and massive open online courses (MOOCs).

7.5. KEY CONCEPTS AND TRENDS IN DISTANCE EDUCATION

This section discusses some of the key concepts and trends in distance education. Theoretical frameworks pertinent to distance education, such as transactional distance, social presence, and connectivism; concepts that require an unconventional lens in distance educational practices, such as learner and culture; and, finally, educational trends rooted in distance education paradigms, such as OERs, massive open online courses, and LA will be discussed.

7.5.1. Transactional Distance and Control in Distance Education

Moore pioneered the theory of transactional distance (1991). Transactional distance views distance as pedagogical distance rather than geographic distance (Moore and Kearsley, 2012). This distance is determined by the amount of interaction between the learner and the instructor, as well as the amount of structure included in the course's design (Gunawardena and McIsaac, 2004). When there is more structure and less learner-instructor dialogue, there is a greater transactional distance. While transactional distance may not appear to be an issue for distance education courses, it may exist in a traditional face-to-face course, such as a large auditorium-style class with little, if any, interaction between the learner and the instructor. The degree to which the instructor exerts control over the course contributes to the course's structure, which increases the transactional distance. Other types of distances may exist in a course, including intellectual (level of knowledge or prerequisite learning), cultural (language, age, gender, religion, and so on), and social (support, closeness, and affinity) (Gunawardena and McIsaac, 2004).

It may appear relatively simple to increase dialogue in a face-to-face course when compared to a distance education course. However, the advent of web tools, particularly social network tools, that enable high levels of interactivity, dialogue, and connectivity, may serve as useful tools for reducing the transactional distance caused by the learner's lack of dialogue with the instructor. However, the presence of such connective tools alone

would not be adequate to foster further dialogue between the learner and the instructor unless the course's required social learning pedagogies are implemented.

As previously stated, the instructor's level of control adds structure to the course, increasing the transactional distance. Instructor control may be desirable to keep learners on track with the course's learning objectives. However, excessive instructor control may turn off the learner due to the course's rigidity and inflexibility, which may prevent the learner from identifying with the course. One way to undermine a course's structure is for the instructor to act as a guide rather than the source of all knowledge in the course. Additionally, allowing the learner to select from a variety of resources may assist the learner in tailoring his or her own learning to his or her own needs and interests. Similarly, providing the learner with options for how to represent his or her opinions, identity, creativity, and productivity, among other things, may contribute to the course's flexibility. Finally, involving learners in the decision-making process during the course instructional design process may aid in reducing the transactional distance created by a rigid structure.

7.5.2. Control in Distance Education

The main objective of adult education is to inspire learners to develop skills that allow them to plan, organize, and conduct their own learning experience. To assist learners in developing independence and self-directed learning abilities, it is critical to investigate the concept of control.

According to Garrison and Baynton (1987), control is comprised of three dimensions: independence, power, and support. It is defined as the opportunity and ability to influence, direct, and determine educational process decisions. The dynamic balance of these three components enables the learner to take control of and maintain control of the learning process. Independence refers to the learner's ability to choose the learning objective, activities, and assessment methods. Independence is associated with the ability to choose what to learn, when to learn it, how to learn it, and where to learn it. Independence is a desirable characteristic of a distance learner that should be encouraged. The second component of control, power, refers to an individual's ability or capacity to participate in and take responsibility for his or her own learning (Figure 7.3).

Figure 7.3. Power is a psychological construct that is related to and influenced by learner variables such as attitude, emotional maturity, cognitive style, self-concept, and motivational level.

Source: https://th.bing.com/th/id/R.d1b21f6b995e053af0f8c65c8fe5c687?rik=w5PdEEVUo536xw&riu=http%3a%2f%2fdsnsite.wpengine.com%2fwp-content%2fuploads%2f2018%2f05%2f2018-05-Cover01_Social.jpg&ehk=0udT0Lb2hHYdm%2f2kYBxKmFNkDxGXjnn2ea51lRJOiwQ%3d&risl=&pid=ImgRaw&r=0.

Support, on the other hand, refers to the resources (courses, learning materials, instructors, and media) that the learner requires to complete the learning process. Support is divided into two categories: financial (logistical) and emotional. While financial (logistical) support refers to the availability of educational materials, emotional support refers to the assistance received by the learner from the instructor, peers, friends, and family.

In a distance education course, emotional support is the human touch. However, a balance of independence and support should be considered, as excessive instructor support may be detrimental to control. Support should be designed in such a way that it encourages the learner to exercise greater control. The three components interact dynamically, and control can be achieved only when these concepts are in balance throughout the learning process. Within an educational program, one of the three control dimensions may be weaker than the other two, reducing the learner's control over the learning experience. In this case, the remaining dimensions must be strengthened to compensate for the reduced strength of the weaker dimension, unless the remaining dimensions are already sufficiently strong to compensate for the reduction. Any individual can learn through distance education if we can strike a good balance between these three dynamic

concepts that comprise learner control over the learning experience. When individuals are given the freedom to diagnose their own learning needs and formulate their own learning goals (independence), when they possess the necessary intellectual ability, study skills, and motivation (power), and when educational materials and emotional encouragement are made available to individuals (support), and when all of these conditions are met in concert with each Individual differences and/or contextual requirements/ restrictions, on the other hand, may cause one dimension to fall short of the others, thereby reducing learner control. The educational institution and/or instructors should then take informed action to increase the learner's reduced control in order to facilitate effective learning experiences on the learner's part.

7.5.3. Social Presence in Distance Education

Gunawardena (1995; and Gunawardena and Zittle (1997) establish a firm theoretical foundation for the concept of Social Presence (SP). Tu and McIsaac (2002), on the other hand, expand on the SP concept by adding additional dimensions. Additionally, they provide practical guidelines that are easily translateable and implementable in online learning environments. SP is defined by Gunawardena (1995); and Gunawardena and Zittle (1997) as "the degree of the other person's salience in the interaction and the resulting salience of interpersonal relationships" (Figure 7.4) (Short et al., 1976, p. 65; cited in Gunawardena, 1995).

Figure 7.4. Social presence in distance education.

Source: https://s30383.pcdn.co/wp-content/uploads/2019/11/20mm-mills-3keys-17-social-presence.png.

SP is associated with two concepts: intimacy and immediacy. Intimacy is determined by factors such as physical proximity, eye contact, smiling, and personal conversation topics. Immediacy is a psychological term that refers to the psychological distance that an individual maintains between himself and others. Immediacy is indicated by verbal and non-verbal cues such as physical proximity, formality of dress, and facial expression, among others. SP is enhanced by both intimacy and immediacy. SP is contingent on the medium's and communicators' qualities.

CMC is thought to be deficient in non-verbal and social cues. However, according to Equilibrium Theory, the absence of one type of communication cue may be compensated for by the utility of other types of cues. What this means is that a communicator will frequently use nonverbal means of communication to relay nonverbal messages (Gunawardena, 1995). As a result, a communicator working in a CMC environment will employ verbal substitutes such as "I agree" and non-verbal cues such as emoticons to effectively convey his/her message. In a face-to-face setting, teacher immediacy behaviors include gesturing, smiling, using humor, vocal variety, personalizing examples, addressing students by name, questioning, praising, initiating discussion, and encouraging feedback. While some of these elements may not be available in CMC (e.g., vocal variety), others, and such as addressing students by name, may be. SP has been identified as a potentially critical component of the effectiveness of learning and teaching in both face-to-face and distance education courses.

In a CMC environment, participants create SP through a variety of strategies, including community construction and reflection, as well as supplementing online communication with additional verbal and non-verbal cues. The development of SP and a sense of community within an online environment becomes critical for promoting collaborative learning and knowledge creation. SP projected by instructors and learners in an online community will have an effect on how the medium's social and human qualities are perceived. While the concepts of interaction, collaboration, and reflectivity are not inherent in the medium, they can be manipulated through design elements, moderator/participant roles, and participation and involvement patterns (Gunawardena and Zittle, 1997). Tu and McIsaac (2002) redefine SP as "the degree of feeling, perception, and reaction to another intellectual entity in the CMC environment" (p. 146). They extend the concept of intimacy and immediacy by incorporating social context, online communication, and interactivity. The social context, which includes task orientation and recipients/social relationships, is constructed based

on the characteristics of CMC users and their perceptions of the CMC environment. According to Tu and McIsaac (2002), social context cues that have a positive influence on SP are:

- Familiarity with recipients;
- Informal relationships;
- Better trust relationships;
- Personally informative relationships;
- Positive psychological attitude toward to technology; and
- More-private locations.

In an online phase, participants requisite some digital literacies such as typing, reading, and writing. Tu and McIsaac (2002) suggest that conversations begin with light/casual subjects. They emphasize how comfortable students are with the medium contributes to the success of collaborative learning. Interactivity encompasses both the activities in which CMC users participate and the communication styles in which they communicate.

7.5.4. Connectivism

A novel theory of learning for distance education? Connectivism is a learning theory that integrates chaos, network, complexity, and self-organization principles into our understanding of how people learn in the Digital Age. According to Siemens (2005), the three broad learning theories of Behaviorism, Cognitivism, and Constructivism were developed during a time when technology was not prevalent in our large-scale learning experiences (Figure 7.5).

Current technological and social software advancements are significantly altering how learners access information and knowledge, as well as how they engage in dialogue with peers and instructors (Siemens, 2008). The rapid advancement of technology and exponential growth in the use of web tools, combined with mobile developments, enable the creation of new and distinct educational structures, organizations, and settings (Kop and Hill, 2008). Siemens argues that we require a new theory of learning that takes into account the impact of technology on traditional thinking and learning models (Siemens, 2005).

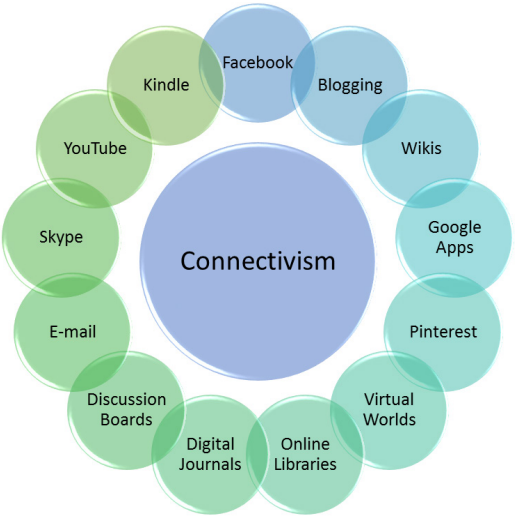

Figure 7.5. Theory of connectivism.

Source: https://th.bing.com/th/id/R.299452d0fdebbbb5d705f7319333c2d1?rik=LfFVR6%2fWNWan8w&riu=http%3a%2f%2f4.bp.blogspot.com%2f-glyhaMOJ2Ao%2fUfBEaibrOrI%2fAAAAAAAAAjsA%2fvUcwxaN87yo%2fs1600%2fConnectivism.png&ehk=YKybPHIsldUtrelpR7SXJhcSsNRfCo5q%2fPXBse5kjxA%3d&risl=&pid=ImgRaw&r=0.

7.5.4.1. How Does Connectivism Differ?

What distinguishes Connectivism from other theories of learning is that, in contrast to earlier theories of learning, which viewed learning as a process occurring "within" an individual, Connectivism asserts that learning can occur "without" an individual. Not only individuals, but also organizations are viewed as learning organisms in connectivism. Additionally, the theory identifies "learning that is stored and manipulated by technology" (Siemens, 2005, p. 5). Additionally, he suggests that knowledge does not reside solely in an individual's mind but is also distributed across a network (Siemens, 2006). As a result, rather than viewing learning as "schematic formation structures," it is viewed as "the act of recognizing patterns shaped by complex networks" (Siemens, 2006, p. 10).

While both Constructivism and Connectivism emphasize the complexity and chaos of learning, Connectivism encourages individuals to create new networks of knowledge or recognize existing ones that will aid in learning.

While Constructivism views learning as a process of meaning creation, Connectivism places a premium on not only meaning creation but also on recognizing patterns in existing meanings and establishing connections within communities of practice. Previous theories have concentrated on how learning occurs but not on what is learned. However, in an era when learners are exposed to exponential growth of knowledge, connectivism values "the ability to evaluate the worthiness of learning something as a pre-learning meta-skill" (Siemens, 2005, p. 2).

7.5.4.2. What Is the Relationship Between Connectivism and Distance Education?

The media on which distance education models rely heavily have evolved significantly, particularly in the 21st century, dubbed the Digital Age. Numerous distance education models include technological tools that facilitate interaction between learner and learner, learner and teacher, and learner and resource. In response to this development, the Connectivist learning paradigm envisions enriched, connected, and networked learning that takes technology into account. Enriched media has the potential to transform the relationship between teacher and student. The teacher, who has evolved into a facilitator of learning, assists the student in developing meta-skills for creating and recognizing specialized information sets, as well as the connections between them (Siemens, 2005). Learners who design their own learning paths and personal learning networks develop a fundamental skill: the ability to see connections between fields, ideas, and concepts. Connectivism places the learner at the center of the learning experience, but acknowledges that learning occurs "within nebulous environments of shifting core elements-not entirely under the individual's control" (Siemens, 2005, p. 7). As a result, the theory places a premium on continuous learning, decision-making as a form of learning, and the capacity to know. Connectivism appears to have had an effect on the instructional design of distance education courses. The concept of MOOCs is an excellent illustration of connectivism's influence on how distance education courses are delivered. Another indicator of the impact is the decline in teacher/content-based Learning Management System adoption. Numerous distance education and traditional education courses are incorporating various social network tools to connect learners, facilitators, and resources (what connectivism refers to as "specialized nodes").

7.5.5. Massive Open Online Courses (MOOCs)

Massive Open Online Courses (MOOCs) have long been a source of contention in education. While some regard MOOCs as a "significant revolution in education," others dismiss them as "yet another example of the frequently exaggerated hyperbole surrounding technology" (Bates, 2014, p. 154). Two distinct types of MOOCs have emerged during the process: xMOOCs and cMOOCs. Bates (2014) compares the philosophy and practice of xMOOCs and cMOOCs in detail. xMOOCs are heavily influenced by behaviorist and cognitivist theories of learning and rely heavily on information transmission via a variety of media. Generally, assessment is automated through the use of multiple-choice tests that are graded by computers. There is little or no direct contact between an individual learner and the course facilitators. In this sense, xMOOCs appear to be a synthesis of the first generation of distance education courses, correspondence study, in which learners were responsible for studying available resources with little or no interaction from the instructor, and Otto Peter's industrialized education, in which high-quality content is produced for mass consumption. The distinctions are in the mode of delivery and the quality and quantity of educational resources available to learners. Although learners have opportunities to interact with one another, there is no feedback or guidance provided during their discussions, and the quality of the discussion is entirely dependent on the learners' expertise. Additionally, the automated grading system used in xMOOCs resembles the pen and paper tests that students take in a large-scale distance education course. In comparison, the educational underpinnings of cMOOCs are based on Connectivist and Social Constructivist theories of learning. cMOOCs rely on community-based approaches to learning, with relatively self-directed learners in constant interaction with other learners and facilitators via a network built around various platform technologies. cMOOCs place a premium on collaborative knowledge construction and meaning making. In this regard, platforms for knowledge sharing, such as discussion forums or special interest groups on social media, are critical. If there is a curriculum, it is loosely defined, and participants learn through the contributions of others, the meta-level knowledge generated by the community, and through self-reflection on their own contributions (Bates, 2014).

7.5.6. Open Educational Resources (OERs)

The genesis of the OER movement is based on the belief that the world's knowledge is a public good and that technology in general, and the World

Wide Web in particular, enable anyone to share, use, and reuse it (Smith and Casserly, 2010). In other words, the OER movement was also motivated by a sense of social responsibility, with the goal of ensuring equitable and universal access to knowledge, with web platforms serving as distribution platforms in particular. This driving force behind the OER movement has sparked numerous initiatives worldwide to increase access to a diverse range of educational resources, including lecture materials and instructional materials (Figure 7.6).

Figure 7.6. Open educational resources (OERs) movement.

Source: https://th.bing.com/th/id/OIP.iwsiYEWwXVRCF351Y1ra1AHaE8?pid=ImgDet&rs=1.

7.5.7. Learning Analytics (LA)

Within an online course, data mining tools assist in tracking learner behaviors by recording variables such as the number of posts, the amount of time spent on the platform, the number of clicks, engagement, and involvement patterns, as well as concept resilience and retention (Johnson et al., 2013). In this context, LA is defined as "the analysis and visualization of data about learners in order to improve learning" (Clow, 2013, p. 683). According to the 2013 Horizon Report, LA has the potential to significantly improve the educational experience for administrators, policymakers, instructors, designers, and learners alike. Administrators and policymakers can use LA to identify at-risk students, evaluate the quality of their programs, and determine the effectiveness of retention improvement interventions (Figure 7.7).

Figure 7.7. Learning analytics (LA) can assist administrators and policymakers in identifying areas for improvement and making more informed resource allocation decisions.

Source: https://www.quantzig.com/wp-content/uploads/sites/5/2020/07/Learning-Analytics.png.

All of these outcomes may contribute to the development of well-informed policies and effective pedagogies that can be continuously evaluated for efficacy and efficiency via LA. Additionally, LA has the potential to help instructors identify learners' strengths and weaknesses by tracking learners' online learning behaviors and preferences, which provides instructors with additional insight into what learners are experiencing. Instructors can make calculated adjustments and suggestions based on LA data in order to motivate students and identify areas for improvement. Additionally, LA enables the development of adaptive learning environments that respond in real time to a student's progress. Learning software design can be altered to increase learner engagement and involvement in an online course. Early warning or encouragement systems may assist learners in assessing their performance and taking timely and informed action. In sum, by enabling the aggregation of large amounts of data on learner behavior, LA enables the tailoring of learning to the individual needs and interests of learners. Additionally, LA has the potential to foster personalized learning environments that adapt to students' learning styles.

7.6. LEARNER IN DISTANCE EDUCATION

Learner engagement and drop-out rates have long been a concern in distance education, and several studies have attempted to identify factors that inhibit or enhance learner engagement and drop-out rates in distance education courses (Grau-Valldosera and Minguillón, 2014; Fozdar, Kumar, and Kannan, 2006; Yates, Brindley Richards, and Thistoll, 2014). Yates et al. (2014) use distance education staff perspectives to identify "enablers" and "barriers" to learner engagement in distance education courses. According to the study's participants, student-centered approaches and high-quality course and resource design were among the enablers.

Yates et al. (2014) emphasize the critical importance of meeting the unique needs of each learner and providing social support in order to increase learner engagement. Additionally, they discovered that learner-teacher and learner-learner interactions were critical in establishing a sense of community among students and fostering a sense of belonging, both of which contribute to learner engagement. The staff course stated that resources and course design were critical enablers of student engagement. On the other hand, low-quality course materials were identified as a barrier to student engagement. Another impediment was learners' negative attitudes.

Additionally, resistance to change was identified as a barrier affecting learner engagement, as some staff were averse to changing or improving the quality of their instructional resources and techniques. Additionally, Yates et al. (2014) identify four student-related enablers that aid in course completion: appropriate course and program selection, monitoring, the use of support services, and participation in a learning community. Their study demonstrates the critical nature of guiding learners toward the appropriate courses, as well as the appropriate amount of study and resources. Encouraging engagement also required vigilant monitoring of learner progress. Academic support and the availability of diverse resources are also important determinants of learner engagement. The final enabler of learner engagement was membership in a learning community, emphasizing the critical nature of establishing learning communities comprised of staff and learners. The first leaner-related impediment was a lack of necessary skills on the part of students. Learners who were unprepared for independent learning in terms of motivation and intellectual abilities such as writing abilities had a detrimental effect on learner engagement. Additionally, learners' social and familial obligations hampered their engagement in the course. Finally, a lack of face-to-face contact was identified as a barrier to

engagement for students. The absence of face-to-face interaction was cited as a barrier to developing relationships with students in order to foster engagement and connection with the institution. Numerous studies have also been conducted to ascertain learner attitudes toward distance education (Lenka and Kant, 2012; Simon, Burton, Lockhart, and O'Donnell, 2014; Smidt, Bunk, McGrory, Li, and Gatenby, 2014). Although these studies do not identify gender as a factor influencing learner attitudes toward distance education, Lenka and Kant (2012) conclude that biographical factors such as locality, stream, and caste all contribute significantly to the development of a favorable attitude toward distance education. Smidt et al. (2014) emphasize the importance of providing clarity and guidance regarding course expectations and responsibilities in order to foster positive learner attitudes. Additionally, they report that it is critical to provide well-designed and creative tasks, such as audiovisual content, for students with a variety of learning styles. Interaction with other students and the instructor is also emphasized as a factor in developing positive attitudes (Farooq, Al-Asmari, and Javid, 2012; Simon et al., 2014).

7.7. CULTURE IN DISTANCE EDUCATION

Culture plays a critical but underappreciated role in the design, perception, and efficacy of the educational experience. With the widespread adoption of connective digital technologies, it is now possible to connect with people from diverse cultural backgrounds, enabling the formation of learning communities that foster intercultural communication (Saykili, 2018). Goodfellow (2008) argues against essentialist approaches to instructional design in distance education, particularly online learning, in his chapter "proposing new directions for research into culture in online learning." While it is reasonable to assume that individuals raised in diverse cultural and sociolinguistic environments will develop their own perceptions and assumptions about learning contexts, when it comes to designing an instructional design for a multi-cultural distance education course, a reductionist approach based on stereotypical national or ethnic cultural differences is also problematic for a variety of reasons (Goodfellow, 2008). According to Goodfellow, culture is primarily associated with nationality, which presents a challenge for distance education because it restricts communication in distance education courses to people of different nationalities. The concept of culture as a national characteristic also reinforces the view of "the suitability of materials or interfaces designed by members of one nationality for use by members of

another nationality" (p. 553). However, the forces driving change in distance education reaffirm the difficulties associated with a view of a 'single cultural identity' (Figure 7.8).

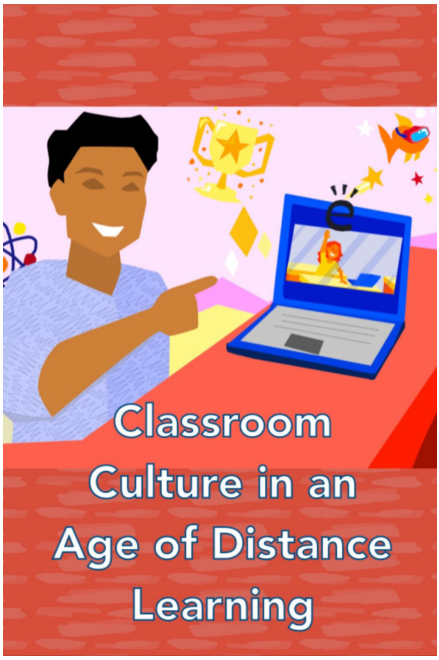

Figure 7.8. Culture in distance education.

Source: https://i.pinimg.com/originals/3d/0c/f9/3d0cf9159a256eaf631bdb2d68a4f3a7.jpg.

The growth of widening participation, which necessitates consideration of learners,' communities,' and educational and professional backgrounds, is a concern for the digital age's new learning ecologies. Additionally, the proliferation of internet communities, networked socializing, and informal learning communities is beginning to have an impact on educational development through the incorporation of web 2.0 technologies into course design. The multinational nature of distance education courses necessitates a rethinking of prevalent western approaches to distance education, particularly online education. The issue with instructional design is the imposition of a single cultural identity on culturally diverse learners, and the solution is viewed as providing culturally appropriate instruction. However, the issue here is how to cater to an audience with a range of cultural backgrounds.

A reductionist approach based on stereotypical national or ethnic cultural differences is also problematic because it ignores the new cultural and social identities formed in virtual learning communities through a synthesis of contemporary cybercultures of the internet and inherited systems of cultural relations from traditional settings. Today, individual cultural identities are shaped not only by national or ethnic characteristics, but also by virtual communities of practice. Thus, the challenge is to make sense of emerging cultural/social identities on virtual platforms and to incorporate them into course design. Recent studies in distance education on culture address the issue of developing and implementing courses for non-western cultures. These studies are largely based on Hofstede's descriptions of national culture (Hofstede, 2001). Hofstede divides cultures into 'individualistic' cultures (focused on self-interest) and 'collectivistic' cultures (focused on the interests of family and wider community); or between 'high-context' cultures (that interpret an interaction's meaning by examining the entire social context: physical location, participant status, body language, and so on) and 'low-context' cultures (that focus exclusively on the content of the interaction). Essentialist views of culture, such as Hofstede's, tend to view culture as an expression of individual behavior and disposition. This translates into instructional design in distance education as the requirement to tailor the design of the learning environment to accommodate individual cultural differences.

The issue with this perspective is that it will be ineffective in coping with unpredictable configurations of heterogeneous and dispersed individuals. It may be beneficial to concentrate on the collective national characteristics of large groups of monoculture individuals cooperating. However, when dealing with a multi-cultural learning ecology, where cross-cultural interaction occurs, the collective national characteristics are absent. Citing Scollon and Scollon (2001); Goodfellow (2008) emphasizes that it is not the cultures that communicate, but the individuals. For these reasons, viewing culture solely as a product of birth or upbringing is problematic in a multi-cultural learning ecology influenced by contemporary cybercultures of the internet, particularly in light of the emergence of new cultural and social identities in virtual communities. Thus, it is critical for instructional designers to consider not only ingrained cultural dispositions and conceptions, but also the manifestations of individual and collective behavior that reflect the emergence of new value systems and modes of communication about learning (Goodfellow, 2008).

7.8. ADVANTAGES AND DISADVANTAGES OF DISTANCE LEARNING

7.8.1. Advantages of Distance Learning

Although there is no alternative for regular education system but distance learning is adding value considerably in the field of education. There are numerous advantages to a distance learning program. It enables learners to have minimal interference in their professional lives. It is an excellent option for those looking to advance their careers or who require specialized training.

Online distance education is rapidly growing in popularity among traditional universities in the United States, to the point where online doctoral programs have developed at prestigious research institutions (Hebert, 2007). Some people who work full-time cannot afford to attend regular classes while also needing to improve their skills for career advancement. Certain individuals who wish to study in prestigious institutions but are unable to do so physically due to a lack of funds or intergovernmental permissions also make use of this system to obtain the necessary education.

Distance learning can provide them with the opportunity to gain knowledge and practical experience while utilizing new technologies, methods, and approaches. Distance learning programs are easier to plan because they require less time and commitment. Distance education programs offer greater geographic flexibility.

Additionally, they connect learners with students from diverse backgrounds and provide opportunities for interaction. Distance learning programs provide access to faculty located in a variety of locations, while class work can be scheduled around personal and professional commitments. Distance education eliminates the need for travel and saves time that would have been spent driving there and back.

A learner can complete a substantial portion of the classes at their leisure. The majority of classes offered through distance learning programs do not require students to attend a session at a specific time and location. A learner can complete and revise assignments as well as complete homework at their leisure. Distance learning programs make it extremely convenient for women, and parents in general, who have children. This eliminates the need for such parents to seek care arrangements, as they can care for their children and classes simultaneously at home.

The use of information technology simplified the entire process, as online classes addressed all possible convenience concerns. It is extremely beneficial for disabled individuals and senior citizens who find it difficult to attend regularly scheduled classes. They are no longer concerned with having access to a classroom. Rather than that, they can use comfortable settings in their homes to make learning more convenient. As a result, individuals with limited mobility have the opportunity to advance their education and careers.

Virtual education has become ingrained in the planning processes of the majority of institutions and training organizations. Distance learning's value has increased significantly over the last several years, as both students and educators have grown more comfortable with technology. While the quality of distance learning has improved, the number of distance learning programs has also increased significantly.

It is encouraging to learn that distance education organizations are now fully recognized by appropriate government agencies. Official approval's purpose is to ensure that education provided by such virtual institutions meets a high standard of excellence.

Distance learning provides a number of advantages and opportunities for international students seeking an accredited degree from some prestigious institutions. Perhaps the most significant advantage is the ease with which you can learn and thus avoid the hassle of applying for a student visa to study in a particular country. Distance learning allows for geographic flexibility, allowing students to study in any convenient location with an internet connection, and requires students to set their own learning pace.

Utilizing technology makes it easier to quickly scan study materials and can be easily mastered. Distance learning is structured in such a way that it enables learners to focus more intensely on curriculum, time, and effort in fields that require new knowledge and proficiency. Additionally, distance learning enables students to obtain study materials at their convenience and at a faster rate than is possible in traditional classroom settings. The learners can freely participate in discussions in the communiqué board discussion areas and receive instant feedback in the form of reviews from online classmates' comments.

Distance learning is a just-in-time learning method that enables students to study the most current study materials. The most significant feature of distance learning is that it enables students to succeed in Web-based classes by enabling them to manage their time effectively. A typical student can

easily spend two to three hours per week for each hour of credit earned in a class.

7.8.2. Disadvantages of Distance Learning

While distance learning has a plethora of advantages, it also has some inherent disadvantages. The fundamental aspect is that it is not for everyone, as it provides insufficient or no physical contact with associate classmates and staff. Additionally, it lacks social interaction and is entirely formal. At the same time, distance learning lacks networking opportunities, making it a less critical option for career development.

Additionally, it is not a viable option for someone who works in a more interactive environment. Distance education does not include career placement analysis of the student's personality. Distance learning programs do not offer all study disciplines, limiting students' options significantly, as the technology and method of instruction are relatively new and do not meet all curriculum requirements. Distance learning programs do not offer scholarships because students are expected to work for a long period of time at a low cost.

Whereas distance learning is more expensive and requires sophisticated technology. Regardless of the numerous opportunities available through distance education, there are unavoidable costs. Live video communication necessitates cautious equipment and service configuration. A computer equipped with accessories, an internet connection, and a camera are required for online education. Both instructors and students require considerable advance planning, and participation in distance education may necessitate adjustments to routine activities.

Distance education does not provide accurate feedback. In a typical classroom setting, questions, and informal tests allow for immediate review of a student's routine. However, with distance learning, a student receives instructor feedback until the instructor evaluates the student's work and responds. Due to the fact that distance education does not always offer all required courses online, many students pursuing a specific certificate or degree program may fall short of the required qualifications. No discipline that requires practical work can be taught entirely online, just as one can study a biology lesson entirely online but cannot perform clinical work online.

While the majority of employers recognize distance learning, some do not. Students who wish to work for an employer following graduation

must be certain of the employer's attitude toward online distance education. Another disadvantage of distance education is that it does not allow learners to practice their oral communication skills. While this is possible with voice chat or conferencing, it is still quite difficult to understand in voice conference settings. Additionally, learners enrolled in distance learning courses do not receive enough practice interacting verbally with professors and other students, even as their written ability improves.

7.9. DISTANCE EDUCATION: THE FUTURE

Technological advancements, in conjunction with pedagogical foundations, have shaped and reshaped the way distance education is structured and delivered. The advancement of appropriate pedagogical models is facilitated by new technologies and social conditions. The cognitive-behavioral pedagogical models that guided distance learning practices in the first generation of distance education were developed at a time when two-way or multiple-way communication was scarce and the majority of learning/teaching activities relied on print-based technologies. While cognitive-behavioral models continue to be used today, social-constructivist models were developed in the era of web 2.0 technologies, which enable two and multiple modes of communication and interaction. Nonetheless, connectivist pedagogy gained traction at a time when technology began to permeate the social domain and its impact on learning reached a point where previous learning models began to fall behind, paving the way for new generations of distance education. According to some experts, technological innovations such as web 3.0, semantic web, mobile devices, augmented, and virtual reality will shape future models (Hendler, 2009). While technological innovations are critical in shaping the future of distance education, it is unlikely that they will stimulate a paradigm shift similar to previous technological innovations, as the nature of communication does not appear to be changing. On the other hand, data mining and LA, combined with communities of learners embedded in a network of learners and resources, will aid in the development of a 'collective mind' that will guide distance education models and pedagogies.

7.9.1. Challenges and Future of Distance Learning

Distance learning is becoming a more prevalent mode of study, particularly in office and workplace education settings across a variety of fields and dimensions. Universities throughout the world are improving their

edification techniques and incorporating enduring education and eventual learning into their teaching learning environments. Almost all institutions of that level of education use information and communication technology to deliver knowledge. Additionally, traditional education is being restructured through the use of virtual learning or web-based knowledge (Figure 7.9).

Figure 7.9. Challenges of distance learning.

Source: https://www.piratemomlife.com/wp-content/uploads/2020/06/the-challenges-of-distance-learning.png.

Distance and technology-based education are given the least priority in countries where education is one of the neglected fields. Large educational institutions and those involved in rule-making do not consider this possibility. These countries face significant obstacles in overcoming new challenges in modern education due to their ever-growing populations, remoteness, and vast scattered areas, as well as a lack of modern information technology resources and funding.

Regardless of the difficulties, nations with a desire to progress will expand their educational institutions sufficiently to accommodate the growing number of online students seeking admission to this type of education. Web-based education is one of the predictable solutions that will continue to expand in the future.

Distance learning challenges are a natural part of any system, method, or practice, and without them, there is little or no room for improvement. In developed countries, distance learning is widely used to supplement education and eventual learning. This approach will continue and will be adopted by developing countries as well.

Distance learning will continue to be unique in the future as an innovative approach to electronically delivering well-designed, learner-centered

content at any location, at any time via the internet. Distance learning will continue to be a component of E-learning, web-based learning via virtual classrooms and digital teamwork, where content will be delivered via the internet, audio, video tape, and video conferencing via satellite, among other methods (Hedge, 2004, pp. 128–145). Rapid and intensive use of information and communication technology in education will continue to benefit developed countries, enabling them to establish an increasing number of universities based on information and communication technology. Although the information and communication technology infrastructure in developing or least developed countries is extremely limited, concentrated use of e-learning in distance education remains a pipe dream for their universities of higher education (Toor 2005, pp. 67–76).

While distance education is not a new trend, it has exploded in popularity as a result of developing technology. Distance education delivery will eventually emerge as a viable educational option with simultaneous use of a phone, a desktop, and a television in the future. When distance education began utilizing information technology, it was not well received, and the equipment required to provide it was prohibitively expensive. That has now shifted dramatically. And video, audio text, graphics, animation, and simulation all make effective use of technology. Distance education is undergoing dramatic change and will never reach saturation, as there is still much to be discovered and presented in this field. New and established institutions are developing cutting-edge technology and a robust data base to provide distance education to a growing population seeking higher education outside of the traditional classroom setting.

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INDEX

A

Academic institutions 170, 180, 181, 184, 187
Academic standard 136
Administrative position 134
Age-appropriate technology 196
Applied Engineering 19
Artificial intelligence 2, 25
Association for Educational Communications and Technology (AECT) 7
Asynchronous learning 20
Audio-visual aids 8, 14, 16
Audio-Visual Education 16
Augmented reality (AR) 23

B

Behavioral change 76
Behavioral psychology 119
Behaviorism 210
Behavior modification 86
Behavior Technology 19
Body gestures 45
Broad audience 35
Broadband technology 177
Business communication 56
Business education 17

C

Civilization 3, 4, 91
Classroom interaction 86
Closed circuit television (CCTV) 109
Cloud-based education 23
Collaborative learning 209, 210
Collective energy 85
Communication ability 57
Communication channel 34, 35, 57
Communication encounter 47, 49, 50, 51, 52
Communication interaction 47, 48, 49, 50
Communication mediums 46
Communication pull 38
Communication research 51
Communicator 39, 43, 44, 45, 55,

62, 68
Computer-based training (CBT) 21, 172
Computer-mediated communication (CMC) 49, 203
Computer network 16
Computer software program 151
Computer-supported collaborative learning (CSCL) 21
Conceptualization 89
Connectivism 210, 211, 212
Constructive feedback 118
Contractual relationship 81
Conventional learning process 151
Corona Virus 180, 181, 183, 184, 187, 189
Correspondence education 196, 199
Critical thinking 144
Cultural environment 54
Cultural setting 51
Curriculum development 82

D

Data collection 114
Deaf adolescent 17
Demonstrator 80
Department managers 37
Descriptive theory 80
Digital Age 210, 212
Digital equity 188
Digital literacy 183
Digital pedagogy 181
Digital school environment 135
Distance education 12
Distance learning 17

E

Educational broadcasting 15
Educational communication 39, 54, 55, 69
Educational efficiency 10
Educational environment 2
Educational experience 199, 214, 217
Educational institution 131, 132, 135, 138, 150, 151, 152, 153, 154, 155, 156, 157, 159, 164
Educational management 150, 152
Educational need 3
Educational process 74, 83
Educational qualification 134, 154
Educational researcher 170
Educational scientist 170
Educational software 139, 142
Educational structure 210
Educational technology (ET) 2, 141
Effective communication 35, 41, 43, 44, 46, 55, 56, 63, 65, 66, 67, 69, 70
Effective leadership 42
Electronic content 188
Electronic gadgets 14
Electronic learning 168
Electronic resource 169, 188
Electronic technology 12
Embarrassment 20
Emotional intelligence 120
Emotional maturity 207
Emotional support 207
Encoding process 45
Engineering technology 8
Environmental noise 49
Exponential growth 210, 212
External distractions 46
Extreme sensory deprivation 17

F

Face-to-face discussion 20
Facial expression 209
Financial analysis 138
Financial support 178
Formal communication 40
Formal institution 17
Foster synergy 85

G

Geographic distance 205

H

Hardware technology 19
Harmonious development 76
Higher order thinking (HOT) 147
High-quality education 181, 188
Home-based learning 17
Human communication 38
Human intervention 177
Human resource executive 179
Human resource management 42
Human resource manager 37
Hybrid learning system 177
Hyperlinks 173
Hypothesis testing 84

I

Independent study 199
Individualization 203
Industrial development 4
Information and communication technology (ICT) 128
Information processing Model 84
Information technology 11, 14, 17, 18
Institutional system 145
Instructional aids 83, 84
Instructional plan 113
Instructional skills 118
Instructional technology 2, 4, 5, 6, 7, 9, 10, 28, 29, 30, 31
Instructor feedback 111
Intellectual capability 17
Intelligent freedom 78
Internet connectivity 178
Internet library 16
Internet supports 16
Interpersonal communication 36, 62, 68, 69

K

Knowledge-based educational system 3

L

Language stimulation 17
Learning environment 75, 82, 83, 87
Learning Management System 182
Learning philosophy 16
Life-long education 199
Linear process 50
Location flexibility 186, 187

M

Magnitude earthquake 184
Management efficacy 37
Management information systems (MIS) 138
Managerial skill 41
Massive Online Open Courses (MOOCs) 197
Mass media 35
Mature personality 75, 88
Medical education program 108,

118
Medical educators 120
Message transmission 49, 52
Micro-teaching 108, 109, 110, 111, 112, 113, 114, 115, 116, 118, 119, 120, 121, 122, 123, 124, 125
Micro-teaching cycle 113, 121, 122
Mobile phone conference 58
Multicultural alliance 51
Multimedia 14, 16, 17
Multimedia training program 168
Mutual understanding 39

N

Natural disaster 183, 186
Need-based learning 22
Networked collaborative learning 21
Nonverbal communication 54
Nonverbal interaction 81
Nonverbal message 34, 52
Normative theory 80
Novel strategy 108
Novel theory 210

O

Off-campus education 196
Online communication 209
Online course 168
Online degree 168
Online education 173, 174, 182, 187, 188
Online etiquette 185
Online learning environment 168
Online library 16
Online messaging 175
Online pedagogy 180
Online program 168
Open education 196
Open educational resources (OERs) 205
Open University in the United Kingdom (UKOU) 203
Oral channel 58
Oral communication 58, 60
Organizational management planning 42
Organizational principles 200

P

Panicky situation 187
Pedagogic skill 108
Peer participation 111
Personal conversation topics 209
Physical connections 175
Physical device 5
Physical environment 46, 69
Physical proximity 209
Potential learner 171
Potential teacher 111
Practical theory 79
Primary motivation 203
Print technology 201
Problem-solving invention 3
Professional education 119, 120
Professional growth 111
Professional responsibility 119
Professional supervision 111
Programmed instruction 4, 8
Project report 132
Psychomotor 80, 84
Pursue education 132

Q

Qualitative investigation 111

R

Radio announcer 49
Radio broadcasts 7
Rational decision-making 128
Reinforcement theory 81
Remote learning 17
Remote teaching 185
Resisting change 181
Resource management 139
Result management 138
Revolutionary change 197
Rural community 130

S

School development goal 2
Second language 119
Self-correcting communication systems 86
Self-paced learning 20
Self-regulation process 120
Semester-long technology literacy course 148
Sexual orientation 54
Sharing information 21
Significant contribution 128, 133, 135, 149, 150
Situational analysis 35
Skill acquisition 115
Skill development 129, 141
Skill mastery 123
Social behavior 81
Social embarrassment 53
Social media 174, 182
Social model 85
Social norm 53, 54
Social presence theory 204
Socratic Method 79
Software adequacy 178
Software applications 2
Software complement 18
Software-driven resource 177
Spoken communication 44, 57
Structural composition 3
Supervisor 109, 112, 113, 115, 121, 122, 123
Systematic observation 109

T

Teacher education program 137
Teaching experience 110, 111
Teaching-learning method 130, 135, 150, 152, 153, 155
Teaching-learning process 5, 10, 13, 19, 74
Teaching model 82, 83, 84
Teaching profession 74
Teaching Technology 19
Teaching theory 79, 80
Technical device 4
Technical support 139, 140, 143
Technology age 136
Technology encompasses 4
Technology enhanced lesson (TEL) 149
Telecommunications 42
Television broadcasts 7
Text-based learning 21
Theoretical foundation 208
Time management skill 151
Traditional classroom 136
Traditional classroom setting 124
Traditional classroom teaching 109
Trainee teacher 112, 114
Transmission model 47, 48, 49, 50, 51
Two-way communication 199, 200, 202, 203

V

Video communication 200, 222
Videoconferencing 172, 173
Videodiscs 16
Video meeting 58
Video recording 110, 113
Videotaping teaching session 125
Vocal message 49, 52

W

Web-based learning 173
Web-based training (WBT) 21, 172
Web network 14, 15

Essentials of Educational Technology

The way we live has undoubtedly altered as a result of technological advancements. It has touched numerous elements of life and changed what it means to live. Without a doubt, technology plays a significant influence in every aspect of life. Numerous manual chores can be mechanized as a result of technological advancements. Additionally, many complicated and crucial tasks may be completed more easily and efficiently with the aid of contemporary technology. Living has changed for the better as a result of the application of technology. Education has been transformed by technological advancements. The significance of technology in education cannot be overstated. Indeed, with the advent of computers in education, both teachers and students have found it easier to transfer knowledge. The use of technology has enhanced the enjoyment of teaching and learning.

Today, more than ever, educational technology (ET) plays a critical role in teaching, owing to the widespread use of information and communication technologies. They recognize the value of educational technology through the use of various distant education applications, the Internet, teachers, and students themselves. The question is whether schools and teachers are prepared for and aware of the benefits of technology in education.

This book will provide an overview of the value and application of educational technology. Educational technology is becoming more prevalent in the classroom. The new generation of children is prepared to work with these new technologies, which play a critical role in children's learning and acquisition of diverse cognitive information, necessitating the incorporation of educational technology into future curriculum. The use of instructional technology improves students' abilities and cognitive traits. With the aid of new technology, there has been an explosion of learning and knowledge acquisition, particularly on mobile devices. In recent years, teachers have incorporated new technologies into the classroom. However, the development and deployment of new technology continue to accelerate, raising the question of whether teachers are adequately prepared to keep up.

The purpose of this book is to equip students with the information and skills necessary to comprehend the organizational and institutional demands and requirements for educational technology. The book will serve as a reference for educators and a textbook for a certificate, master's, and doctoral programs in educational technology, instructional systems, and learning design.

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