

**WEB-BASED LEARNING AMONG TEACHERS AND
STUDENTS OF PROFESSIONAL AND GENERAL DEGREE
COLLEGES IN MIZORAM**

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF DOCTOR OF
PHILOSOPHY**

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**WEB-BASED LEARNING AMONG TEACHERS AND STUDENTS OF
PROFESSIONAL AND GENERAL DEGREE COLLEGES IN MIZORAM**

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Submitted

**In partial fulfillment of the requirement of the Degree of Doctor of Philosophy
in Education of Mizoram University, Aizawl**

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CERTIFICATE

This is to certify that the thesis entitled **‘Web-based Learning among Teachers and Students of Professional and General Degree Colleges in Mizoram’**, submitted by V. Vanlalruati, Ph. D. Scholar, Department of Education, Mizoram University, Regn. No. MZU/Ph.D./1217 of 25.07.2018, for the degree of Doctor of Philosophy in Education of the Mizoram University, Aizawl, India embodies the record of original investigations carried out by her under my supervision. She has been duly registered and the thesis presented is worthy of being considered for the award of Ph.D. degree. This research work has not been submitted for any degree of any other university.

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I **V. VANLALRUATI**, hereby declare that the subject matter of this thesis is the record of work done by me, that the contents of this thesis did not form basis of the award of any previous degree to me or to do the best of my knowledge to anybody else, and that the thesis has not been submitted by me for any research degree in any other University / Institute.

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COPY OF PUBLISHED ARTICLES

CERTIFICATES OF PRESENTATION

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PARTICULARS OF THE CANDIDATE

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ABBREVIATIONS

ACRCs	- Audio-Video research Centres
Asymp. Sig	- Asymptotic significant
B. Optom.	- Bachelor of Optometry
B. Pharma.	- Bachelor of Pharmacy
B. Sc. Nursing	- Bachelor of Science in Nursing
B. V. Sc. & A.H	- Bachelor of Veterinary Science and Animal Husbandry
B.A.	- Bachelor of Arts
B.C.A	- Bachelor of BCAs
B.Com.	- Bachelor of Commerce
B.Ed.	- Bachelor of Education
B.Sc. MLS	- Bachelor of Medical Laboratory Science
B.Sc. MLT	- Bachelor of Science in Medical Laboratory Technology
B.Sc. RIT	- Bachelor Science in Radiology and Imaging Technology
B.Sc.	- Bachelor of Science
CAI	- Computer-Assisted Instruction
CLASS	- Computer Literacy and Studies in Schools
Com.	- Commerce
Comp. App.	- Computer Application
Comp. Sc.	- Computer Science
DCSE	- Diploma in Computer Science and Engineering
DETE	- Diploma in Electronics and Telecommunication Engineering

Df	- Degree of freedom
DIL	- Distributed Interactive Learning
DPL	- Distributed Passive Learning
EDUSAT	- Educational Satellite
EMRCs	- Education Multimedia Research Centres
ET	- Educational Technology
GMLC	- Government Mizoram Law College
Govt.	- Government
HEIs	- Higher Education Institutions
IASE	- Institute of Advanced Study in Education
ICT	- Information and Communication Technology
IT	- Information Technology
KVK	- Krishi Vigyan Kendra
L.L.B	- Bachelor of Legislative Law
LAN	- Local Area Network
LMS	- Learning Management System
M.B.B.S	- Bachelor of Medicine and Bachelor of Surgery
Med.	- Medical
M.Ed.	- Master of Education
M.Pharm.	- Masters of Pharmacy
M.Sc. MLS	- Master of RIPANS Laboratory Science
MCA	- Master of BCAs

MOOCs	- Massive Open Online Courses
NEP	- National Education Policy
NETF	- National Educational Technology Forum
NIELIT	- National Institute of Electronics and Information Technology
NKC	- National Knowledge Commission
NMEICT	- National Mission on Education through ICT
OLEs	- Online Learning Environments
Ph.D.	- Doctor of Philosophy
RFID	- Radio Frequency Identification
RIPANS	- Regional Institute of Paramedical and Nursing Sciences
SD	- Standard Deviation
Sig. level	- Significant level
SWAYAM	- Study Webs of Active Learning for Young Aspiring Minds
UPA	- United Progressive Government
Vet. Sc.	- Veterinary Science
VSAH	- College of Veterinary Science & Animal Husbandry
WBTLA	- Web-Based Teaching and Learning Approach

CHAPTER – 1

INTRODUCTION

1.1 Prologue

The traditional teaching-learning process has revolutionized the modern educational system by introducing technological innovation. The educational system is gradually adopting more of this technological advancement, which has resulted in positive regard in many institutions. Although certain institutions have not adopted these new techniques, the internet has brought about a significant change, leading to a paradigm shift in the fundamental way learning occurs.

Even though the Internet had not yet been created, students at the University of Illinois in the United States began learning in 1960 using computer terminals connected to a network. With the advent of Computer-Assisted Instruction (CAI) systems in the 1960s and 1970s, the concept of utilizing computers for teaching first emerged. These early systems were primarily designed for drill-and-practice exercises and were often mainframe-based.

During the Fourth Plan in 1972, India's educational programme was started in the Central Sector. The programme's objective was to develop educational technology resources to bring about qualitative improvement in education, accelerate the expansion rate, make instruction more interesting, widen access to education, and reduce the differences between various demographic segments and nationwide. A centre for developing educational technology under the National Council of Educational Research and Training has been implemented, along with Educational Technology Cells in 21 states, a department, and an Educational Technology unit in the Ministry of Education, in cooperation with the United Nations Development Programme.

The development of networking and telecommunications technology in the 1980s made more interactive and collaborative kinds of online learning possible. To provide students worldwide with educational resources, universities and research

centers started experimenting with computer networks. The first online course was offered in 1984 by the University of Toronto. The World Wide Web, founded by Ti Berners-Lee in 1989, completely changed how people could access and share information.

Parliament, during the Budget Session in 1986, discussed and adopted the 'National Policy on Education 1986'. It was a vital step in recognizing the function of technology in education. The policy stated, *"Educational Technology offers the means to reach numbers in remote and inaccessible areas, remove the disparity in educational facilities available to the disadvantaged, and provide individualized instruction to learners conveniently suited to their needs and pace of learning"* (HRD Ministry, Government of India. Report of National Policy on Education, 1986, p.169) stressed the requirement of Educational Technology (ET) to advance the accessibility, quality, and governance of education.

The internet began to be commercialized in the 1990s, and search engines like Yahoo and Google started to surface. The widespread use of wireless communication technology and mobile phones revolutionized communication and access to information. The first learning management systems (LMS) on the web emerged in the late 1990s. These systems, such as WebCT and Blackboard, provide teachers with the ability to design online courses, manage the course materials, and encourage student participation and communication.

The emergence of smartphones, social media platforms, and streaming services can be attributed to the convergence of multiple technologies in the 21st century, such as media, computing, and telecommunications. With the advent of cloud computing, people can now access data and services online. Technological breakthroughs and growing user demand for flexible study schedules also fueled the fast expansion of online education choices during this time. Massive open online courses (MOOCs), professional development courses, and fully online degree programmes were introduced by institutions and organizations worldwide. With the advancement of multimedia technology and internet bandwidth, online learning

became more dynamic and captivating, with virtual labs, simulations, and video lectures. Moreover, social learning elements started to appear in most online courses.

Two central government schemes have developed these policies: ET and Computer Literacy and Studies in Schools (CLASS). These two essential proposals led to an exclusive satellite dedicated to educational services, EDUSAT, launched in 2004. Many initiatives, programmes, and policies have been set up to promote the welfare of the education system in collaboration with educational technology. The role of educational technology continues to get the attention of the government of India. The policy placed a strong emphasis on using media and technology to prevent structural dualism as well as to reach out to underserved areas. As a result, numerous actions were taken, including the creation of education multimedia research centres (EMRCs/EMMRCs) and audio-video research centres (AVRCs) in several institutions. There are still 22 of these EMRCs operating as inter-university centres in places like Indore, Patiala, and Ahmadabad. India's need for technology-based educational services was demonstrated by the 2004 launch of EDUSAT, a dedicated satellite for educational purposes. During the same time, the 2000s recommendations of the National Knowledge Commission (NKC, 2009) and the implementation of these recommendations by the United Progressive Government (UPA) government gave impetus to empower educational institutions with high-speed networks and digital libraries. These policies aim to produce an environment for optimal utilization of Information and Communication Technology (ICT) in education. In keeping with this, numerous modifications have been made to better integrate improved technology into teaching and learning, expanding access at all educational levels.

21st-century education also encourages the growth of the definition of literacy beyond reading, writing, and arithmetic, which may have led to what is learned and taught in institutions. Literacy now includes themes such as finances, media, social/emotional development, physical fitness or health, ecology, and creativity. In recent times, much advancement has been made in technology. Books, print media, radio, and later television satisfied the need for information and knowledge in the past. The use of online technology in education has great potential for cost savings,

increased accessibility, and more accurate delivery of the appropriate course at the proper level and time.

‘Educational Technology is a wide-ranging term encompassing all new technology used in and for learning or education, and it is gaining increasing importance in the present times. India has become the second-largest smartphone market, surpassing the USA worldwide, with 158 million shipments in 2019. (Counterpoints’ Market Monitor Service, 2020)’

The government in Mizoram has also recognized the power of Information Technology (IT) and framed Policies concerning their states in line with the Central Government's initiatives.

1.1.1 Mizoram IT Policy 2001

In parallel with the central government's initiatives, the Government of Mizoram has also adopted the Mizoram IT Policy 2001 (Cabinet decision no. 13 dated 28.05.2001). The policy supports the promotion of IT in several fields, including Education. The main goals were two,

- ICT Literacy and Education
- ICT based Education

Policies focus and match with the deliveries and increase in expenditure on infrastructure, technology, and other resources. The policies are vibrant to meet the challenges and cater to the growing needs and demands of society. As India is one of the leading IT service providers in the country, web-based learning has the most important role to play in India's growth in all phases. Being one of the top providers of online learning services in India is made possible by top-notch IT professionals and infrastructure. To improve the online learning environment in India, the government is acting proactively in terms of regulations and financial resources.

The demand for fresh opportunities for thinking and greater access to educational resources has led to repeated affirmations of educational reforms as a

result of the shifting needs of society and its inhabitants. This is possible only by changing the educational system to meet societal needs. As information technology's influence on societal development grows, new challenges must be met with a lively and engaged response.

1.1.2 Integrating Technologies in Education (Higher)

To modernize its educational system and improve accessibility and educational quality, India has been actively integrating educational technology into its policy. Some critical aspects of Indian policies regarding educational technology include:

1. **National Education Policy (NEP 2020):** NEP 2020 formed an autonomous body, the National Educational Technology Forum (NETF), to provide a platform for the free exchange of ideas on using technology to boost learning, assessment, planning, and administration. The NEP 2020 emphasizes the integration of technology in education at all levels. It promotes the use of digital resources, online learning platforms, and adaptive learning technologies to make education more inclusive and flexible. It has proposed various reforms for our nation's school systems and higher institutions. The incorporation of online and digital education innovations has placed a strong emphasis on the various facets of teaching and learning. The new education policy has demonstrated great promise and dedication to make online teaching and learning easier and promote the use of these online platforms for efficient teaching and learning.
2. **Digital India Initiative:** Launched by the Government of India, Digital India aims to transform India into a digitally empowered society and knowledge economy. Under this initiative, various programs and schemes are implemented to promote digital literacy, e-learning, and the use of technology in education.
3. **ICT in Education:** The Ministry of Education (formerly known as the Ministry of Human Resource Development) has been implementing various

initiatives to promote the use of ICT in education. This includes the provision of ICT infrastructure in schools, developing digital content, and training programs for teachers on integrating technology into teaching.

4. **National Mission on Education through ICT (NMEICT):** This mission aims to leverage ICT to provide high-quality education and knowledge resources to students and teachers nationwide. It includes initiatives such as the National Digital Library of India, SWAYAM (Study Webs of Active Learning for Young Aspiring Minds), and SWAYAM PRABHA, which offer online courses and educational resources. Technology-based educational stages, such as DIKSHA (Digital Infrastructure for Knowledge Sharing) /SWAYAM, are incorporated into schools and higher education nationwide. Higher education institutions (HEIs) lead the way in exploring disruptive technologies and developing educational materials and courses in innovative fields.

India has the most significant population of young people in the world, and Internet use has a substantial impact on this generation. Fortunately, a successful accomplishment can only be attained if the path is taken correctly; no success is had without it. The global expansion of numerous chances for improving knowledge and information are offered by web-based teaching and learning. Integrating digital technologies into higher education is changing how we teach and learn, but this process faces challenges that impact how well and how long these technologies can be used

Challenges in Integrating Technologies in Education

Some of the challenges that educational institutions, teachers, and students face in the course of web-based learning integration can be concisely described as follows-

Institutions

1. Limited network connection: Broadband access is still unavailable in certain institutions. There are many remote areas where network connectivity is quite low, which hinders institutions from setting up web-based learning-enabled environments. Problems with internet connectivity, sudden website shutdowns, and computers with old operating systems are the main barriers in institutions. These challenges hamper the smooth functioning of web-based learning and enable classes or may deter teachers and students from creating e-lesson plans.
2. Insufficient funding: When there is sufficient funding for infrastructure, management, and support, technology can be utilized effectively. In addition to the allocation of proper funding, the setting up of web-based resources, the training of teachers and students, the appointment of technical or support staff, and the availability of appropriate software are essential for smooth functioning.
3. Inadequate and poor maintenance of resources: Lack of access to web-based resources and poor maintenance can be a factor behind the decreasing use of web-based learning facilities. Due to a lack of training and proper guidance in maintaining web-based resources, they became easily inaccessible.

Teachers

1. Lack of competent teachers: Some teachers lack competence due to a shortage of training. Skilled teachers are needed to operate web-based learning facilities, but trained or experienced teachers are insufficient in

various institutions. Incompetent teachers are less enthusiastic about integrating technology in the classroom.

2. Lack of appropriate software and material: Teachers lack sufficient knowledge about using appropriate software and material. They were unable to find software and material related to their subject matter, which discouraged them from using web-based learning facilities.
3. Resistance to change: Teachers get so comfortable with the teaching style they have been following for a long time that they resist the progressions made by web-based learning. Their belief systems matter as they influence how technology is utilized in the classroom.

Students

1. Limited accessibility and network connection: Many institutions lack internet connectivity and speedy internet connections, which prevents students from learning through asynchronous and synchronous mediums.
2. Lack of knowledge: Due to a lack of proper guidance and orientation, students cannot utilize web-based learning for educational purposes. Students lack the benefits and importance of web-based learning resources as they do not have enough awareness.

1.1.3 Transforming Traditional learning into a Digital learning pattern

In traditional education, a teacher interacts with a class of students in a conventional classroom. In addition to learning about certain courses and often gaining real-world job experience, students attend the classroom for predetermined periods. The traditional learning curriculum considers teachers transmitting information to a group of students who passively listen and acquire knowledge. In traditional classroom settings, blackboards, chalkboards, textbooks, assignments, tests, science lab apparatus, materials, worksheets, etc., were all used to deliver education in all physical formats. Students attend class in person to receive

education, while teachers instruct them verbally with the help of a whiteboard or blackboard.

Three primary traditional learning theories are behaviourism, cognitivism, constructivism, humanism, and connectivism.

- Behaviourism: According to Simply Psychology, "Behaviorism is only concerned with observable stimulus-response behaviours, as they can be studied in a systematic and observable manner". Learning is based on a set of procedures that "drill" information into students' memory banks together with supportive remarks from teachers and the institution itself. Students who accomplish above and beyond expectations are recognized and given positive reinforcement.
- Cognitivism: Both internal mental processes and external stimuli, such as facts or information, are necessary for learning. The 1950s saw the development of cognitivist theory, which departs from behaviourism to emphasize the mind's function in learning. According to the International Bureau of Education, "In cognitive psychology, learning is understood as the acquisition of knowledge: the learner is an information-processor who absorbs information, undertakes cognitive operations on it and stores it in memory."
- Constructivism: To 'construct' a new understanding, the student uses his or her existing knowledge and understanding. According to Simple Psychology, "The passive view of teaching views the learner as 'an empty vessel' to be filled with knowledge," while constructivism holds that students can only create meaning by actively engaging with the world (via experiments or discussions of real-world issues).
- Humanism: Humanism is a 'learner-centric approach', highlighting the potential rather than the method or materials. On the other hand, humanism is based on the principle that human beings are inherently good. Humanism is concerned with creating an environment conducive to the self-realization of

the learner. In this way, the needs of the learner are fulfilled, and the learner has the freedom to set his or her own goals while the teacher helps him or her meet those learning goals.

- **Connectivism:** Connectivism, which draws from the knowledge of the digital world, departs from constructivism in that it addresses gaps in knowledge. Technology strongly impacts connectivism, which emphasizes the ability of the learner to obtain and update accurate knowledge continuously. Finding the greatest information requires knowledge of both where to look and how to obtain it.

Technology, digital content, and education are needed for digital learning. It makes information delivery to students easier. So, digital learning is any learning that involves learners using digital tools, platforms, systems, or applications. This includes online courses, online research on Google, online video content and digital tools used during in-person training, a blog, a real-time lecture, or an audio file. Digital learning comprises using at least one gadget, such as a computer, laptop, or mobile phone or smartphone. A digital learning resource (DLR) is a term used to describe learning resources that help students and teachers navigate the learning process. The goal of DLR is to improve student engagement, facilitate curriculum development and availability, and boost student performance.

1.1.4 Online Education and Digital Education

The fundamental connection lies in how technological advancements are not merely improving, but fundamentally reshaping the traditional teaching-learning process. A step-by-step guide is promoting online education in the wake of the recent surge in pandemics and epidemics. It is essential to be prepared with alternative forms of quality education, wherever and however traditional and face-to-face modes of education cannot be accessed. A digital infrastructure, digital content, and capacity building will be established within the Ministry of Human Resources and Development (MHRD) to cater to the e-learning requirements of schools and higher education institutions.

Technology has completely changed how we learn and how we do things traditionally. It essentially increases access to lifelong learning by eliminating the issues and obstacles to education brought about by time and space.

Digital and online learning could completely transform the conventional teaching and learning process. They can significantly increase access to lifetime learning and remove time and space-based barriers to education. Students no longer need to meet with their teacher at the same time and place to attend online classes. Modern technologies have the power to alter how people view higher education fundamentally. A higher education institution is no longer only a physical place with classrooms and residences where students can come to study advanced studies.

The transformation of education, particularly in the face of disruptions like pandemics, is inextricably linked to the adoption of web-based teaching and learning, manifesting in various modes. This alignment allows for greater accessibility, flexibility, and a fundamentally changed educational landscape.

Web-based teaching

For the past few decades, the specific skills and knowledge required to be computer literate have remained undefined and have not been found to be compulsory necessities in the education system. New and emerging technologies have brought the education community to experience reforms and revolution. Besides the students, the teachers were also the victims of these changes. The new era has brought the teachers refresher courses on information and communication technology usage. The role of the teachers is to ensure that the students are guided and provided with the requirements of the students. The teachers are well prepared and ready to give immediate feedback and support in accordance of the prerequisite of the students. Ensuring the learning environment and taking care of learners' needs and desires are the tasks of the teachers.

Web-based learning

Web-based learning or e-learning allows students and teachers to take part in new types of educational activities that are more efficient, user-friendly, and result-oriented than traditional types of education. For imparting education to students in the global area, Web-based learning includes using computers and the internet, along with various other means of gadgets or technology such as mobile phones, tablets, etc. Web-based education is flexible, self-paced, etc. Classes can be joined or taken from home comfortably using a simple internet connection. Its facilities offer several resources, study guides, and reference materials.

The pandemic outbreaks have led to the unveiling of online learning education and encouraged the faculty to use and support classroom activities and overcome the barriers and limitations of the face-to-face environment. In this learning model, the students can watch their teachers' video clips of the lecture online whenever they have time. In some institutes, teachers also host online interactions.

Modes of web-based

1. Support learning: The basic function of web-based learning is to support the teaching-learning activities organized in the institutes. A teacher can use web-based learning to improve teaching, and a student can use it for his or her learning needs, such as using multimedia services, the Internet, and web services to improve their teaching and learning activities in the classroom.
2. Blended learning: Blended learning or hybrid learning, often referred to as technology-mediated instruction, web-enhanced instruction, or mixed-mode instruction, is a teaching methodology that integrates online learning resources and online engagement with traditional classroom techniques.

Blended learning combines traditional classroom learning, which includes face-to-face learning, with online instruction, giving students more flexibility than traditional learning styles.

1. Asynchronous: Asynchronous learning allows learners to complete the course at their own pace. It is facilitated by media such as audio-video aids, e-mail, discussion boards, and websites, which learners can access and log on to online learning environments anytime. It includes self-guided lesson assessments and pre-recorded lectures that students watch according to their time and needs.
2. Synchronous: Synchronous learning involves the interaction of students with teachers via the web-real time. Synchronous classes are conducted and operated in real-time with teachers and students attending sessions from different locations.

Principles of web-based learning

The principles of web-based learning, which serve as guiding principles for identifying and evaluating web-based learning, are as follows:

1. The learning process must have a distinct goal, specific outcomes, and objectives. Web-based learning designs must consider the type of information, nature of the content, specific context, desired learning outcomes, and characteristics of the learner.
2. The learner is actively engaged and enthusiastically participates. Concrete, interactive, and hands-on experiences are highly effective. Learning by doing, analogy, and assimilation are becoming increasingly significant instructional approaches. Learning objectives should, however, be feasible and applicable wherever possible to reflect real-world situations.
3. A variety of media is appropriately used in the learning environment. A variety of learning styles are engaged by using different types of media to achieve learning outcomes. The preference for media should also depend on the nature of the content, education goals, availability of technology, and the educational environment.

4. Educational environments must consist of problem-based as well as knowledge-based learning. Knowledge-based learning involves recollection, understanding, and application, while problem-based learning engages with higher-order thinking skills such as analysis, synthesis, and assessment.
5. Learning activities ought to encourage communication and the growth of interest-based groups. Learning is contextually sensitive and social. Interaction and collaboration-based learning experiences foster learning communities and provide a network of support to improve learning outcomes. Elevated degrees of engagement and simulation can be achieved through multiple encounters, group cooperation, and cooperative learning.
6. In a democratic society, the greater social goal of education and training is furthered by the practice of distant learning. Developing new information and altering mental models gives students an agency and promotes critical thinking.

1.2 Rationale of the Study

The scope of technology is continuously expanding and is now a vital part of human activities. Technological advancements have resulted in the creation of new fields and job opportunities. Education has also been impacted by technology as traditional methods are being replaced by innovative ways of teaching and learning. The internet has transformed the basic approach to learning, leading to a significant shift. The pandemic situation has further accelerated the adoption of online learning methods, which are being encouraged by educational institutions to complement classroom activities. In this new learning paradigm, students can access lecture videos prepared by their teachers and, in some cases, even participate in live online interactions.

Today's educational environment is a complex interplay of goals, needs, requirements, pressures, and resources. Mizoram, a significant geographical area in a country of vast diversity, boasts the 3rd highest literacy rate in India at 91.3%, according to the Census of 2011. While the literacy rate is commendably high, the

state still requires improved facilities and services to enhance its manpower resources. However, certain inherent challenges, such as the mountainous landscape and inadequate infrastructure, render this region difficult to navigate. The government must take measures to address the deficiencies in higher education in Mizoram. The Twelfth Five-Year Plan of the planning commissions has also underscored the importance of educational quality in this area. It is essential to incorporate technological advancements into the teaching and learning processes to remain aligned with the continuously evolving possibilities and demands.

Increasingly, institutions are integrating web-based learning into their teaching methods. By adopting web-based learning, institutions can reach a broader audience, provide more flexible learning options, and offer access to resources from anywhere in the world. The convenience and accessibility of web-based learning accommodate the diverse needs of students, including those with full-time jobs, family responsibilities, or geographical constraints. Additionally, web-based learning facilitates interactive and collaborative activities, enhancing student engagement and knowledge retention. As technology continues to evolve, it is essential to comprehend the rationale behind the integration of web-based learning in higher education and its effects on student learning outcomes. By understanding how web-based learning can support and enhance traditional teaching methods, professors and course designers can effectively create courses that utilize the capabilities of the World Wide Web (Arbaugh, 2005) and develop dynamic and interactive learning experiences for students. Furthermore, integrating web-based learning can also promote the development of essential digital literacy skills, equipping students for the evolving demands of the modern workforce.

As technology has increasingly taken on vital roles in our educational system, teachers and students are expected to possess knowledge, perception, and skills in utilizing various forms of educational technology. Few studies on web-based learning have been conducted in other regions of our country and worldwide. However, no research has ever been carried out on web-based learning among teachers and students at professional and general degree colleges in Mizoram.

Therefore, a study aiming to explore the accessibility, perception, and usage of web-based learning by teachers and students from professional and general degree colleges would help us understand the extent to which educators and students access the internet, perceive web-based learning, and employ it in their education. Moreover, investigating web-based learning would allow us to suggest measures for the implementation and integration of web-based learning within the educational system. Through this study, the investigator anticipates revealing the level of awareness surrounding web-based learning to enhance this moral code for the betterment of our society in the state.

In light of the widespread adoption of technology across domestic and occupational settings children must acquire the requisite skills and knowledge for its effective utilization, fostering their academic and professional development. Taking this background into account, research on the application of computers and computer-aided technology, also known as information and communication technology, in the teaching and learning process is desperately needed by society. The appropriate implementation of technology across all educational levels will help streamline classroom operations, enhance teacher professional development, improve access to education for underprivileged learners, and improve educational planning, governance, administration, and management.

In addition, studying the underlying principles of web-based learning allows educators and institutions to identify the challenges and benefits associated with its implementation. This understanding can lead to the development of the best practices and guidelines for leveraging web-based tools effectively in academic settings. Moreover, the exploration of web-based learning in the context of higher education can also provide insights into the potential impact on student satisfaction, retention rates, and overall academic performance. By delving into the foundation of web-based learning, educators and educational institutions can harness the full potential of this approach to enrich the learning experience and better prepare students for success in the digital age.

1.3 Statement of the Problem

To find out web-based learning resources provided to the teachers and students and resources accessed by teachers and students of professional and general degree colleges in Mizoram, the present study was formulated as below:

Web-based Learning among Teachers and Students of Professional and General Degree Colleges in Mizoram

1.4 Operational Definitions of Key Terms

- **Web-based Learning:** Web-based learning is the practice of delivering education globally through the use of computers, the Internet, and various other technological tools, such as mobile phones. The Internet makes it feasible to participate in email-based discussion groups, video conferences, and live lectures or video streaming.
- **Professional Colleges:** Professional Colleges are educational institutions that prepare students to work in a particular profession, practice, or business sector, often meeting the academic requirements for licensure or accreditation. Professional courses refer to a variety of education and training in a specific area. These courses provide a well-defined area in medicine, engineering, management, law, mass media, hospitality, computers, pre-service teacher training programmes, etc. In this study, the term 'professional course' refers to M.B.B.S., B.V. Sc. & A.H., B.Sc. Nursing, B. Pharma., B.Sc. MLT, B.Sc. RIT, B.C.A, L.L.B., and B.Ed.
- **General Degree Colleges:** General Degree Colleges are educational institutions that provide students with a breadth of knowledge across disciplines and depth into specific areas of personal interest. These include Bachelor of Arts (B.A.), Bachelor of Science (B.Sc.), Bachelor of Computer Application (BCA), and Bachelor of Commerce (B.Com.).

- **Teachers:** A teacher is someone who provides education, instructs, and teaches. In this study, the term ‘teachers’ encompasses all educators working in degree colleges (undergraduate level) in Mizoram.
- **Students:** The term ‘student’ encompasses anyone enrolled in a school, college, or university. In this study, it refers to all individuals pursuing different degrees (undergraduate courses) in colleges in Mizoram.

1.5 Research Questions

In both quantitative and qualitative research, research questions serve to focus the purpose statement on particular issues that the researchers seek to answer. Researchers typically develop them before identifying the methods of the study, i.e. the types of data to be collected, analyzed, and interpreted in a study (Creswell, 2003).

After reviewing the relevant literature, the following questions were raised.

- 1) What are the types of web-based resources being provided to the teachers and students of professional and general degree colleges?
- 2) How are the ICT resources being utilized by the teachers and students?
- 3) How is web-based learning helpful in the teaching process?
- 4) How is web-based learning helpful in the learning process?
- 5) How do the teachers of professional and general degree colleges differ in the perception of the use of web-based learning resources in the teaching-learning process based on their gender and discipline?
- 6) How do the students of professional and general degree colleges differ in their perception of the use of web-based learning resources in the teaching-learning process based on their gender and discipline?
- 7) How do the teachers of professional and general degree colleges differ with regard to their perception and use of web-based learning?
- 8) How do the students of professional and general degree colleges differ with regard to their perception and use of web-based learning?

- 9) What are the areas of web-based services and practices which need to be improved?

1.6 Objectives of the Study

The objectives of the study were as follows: -

1. To find out the web-based learning resources being provided to the teachers and students of professional and general degree colleges in Mizoram.
2. To find out the web-based learning resources being accessed by the teachers and students of professional and general degree colleges in Mizoram.
3. To find out the perception of teachers and students of professional and general degree colleges in Mizoram about web-based learning.
4. To find out the uses of web-based learning by the teachers and students of professional and general degree colleges in Mizoram.
5. To compare the perception of -
 1. professional and general degree college teachers in Mizoram regarding web-based learning.
 2. professional and general degree college teachers in Mizoram with reference to their gender and discipline.
 3. professional and general degree college students in Mizoram regarding web-based learning.
 4. professional and general degree college students in Mizoram with reference to their gender and discipline.
6. To compare the uses of web-based learning among-
 1. professional and general degree college teachers in Mizoram

2. professional and general degree college teachers in Mizoram with reference to their gender and discipline.
3. professional and general degree college students in Mizoram
4. professional and general degree college students in Mizoram with reference to their gender and discipline.
7. To give suggestions to the professional and general degree college administration about the improvement of web-based learning resources.

1.7 Null Hypotheses

A hypothesis is a tentative solution to a problem (Leedy & Ormrod, 2015). However, the null hypothesis (H_0) states that there is no true difference between the means of the two populations, and any variation between the sample means is purely coincidental and irrelevant, resulting from sampling fluctuations and random chance. The following hypotheses have been stated to realize the above objectives:

- i. There is no significant difference in the perception of teachers of professional and general degree colleges in Mizoram about web-based learning.
- ii. There is no significant difference in the perception of teachers of professional and general degree colleges in Mizoram about web-based learning with reference to their gender.
- iii. There is no significant difference in the perception of teachers of professional and general degree colleges in Mizoram about web-based learning with reference to their discipline.
- iv. There is no significant difference in the perception of students of professional and general degree colleges in Mizoram about web-based learning.
- v. There is no significant difference in the perception of students of professional and general degree colleges in Mizoram about web-based learning with reference to their gender.

- vi. There is no significant difference in the perception of students of professional and general degree colleges in Mizoram about web-based learning with reference to their discipline.
- vii. There is no significant difference in the use of web-based learning among teachers of professional and general degree colleges in Mizoram.
- viii. There is no significant difference in the use of web-based learning among teachers of professional and general degree colleges in Mizoram with reference to their gender.
- ix. There is no significant difference in the use of web-based learning among teachers of professional and general degree colleges in Mizoram with reference to their discipline.
- x. There is no significant difference in the use of web-based learning among students of professional and general degree colleges in Mizoram.
- xi. There is no significant difference in the use of web-based learning among students of professional and general degree colleges in Mizoram with reference to their gender.
- xii. There is no significant difference in the use of web-based learning among students of professional and general degree colleges in Mizoram with reference to their discipline.

CHAPTER – 2

REVIEW OF RELATED LITERATURE

2.1 Introduction

It is impossible to finish a substantial research project without first reviewing pertinent literature. Every study, project and knowledge advancement is always predicated on the body of information already known about the topic. Thus, each carefully thought-out research project must start with a survey of relevant literature. The region that has to be worked on may then be readily surrounded by the researcher. Getting away from the monotony of an already completed job is also beneficial. Carefully reviewing relevant material can add fresh information to the subject on its own.

One of the key elements in the preparation of any research data is a thorough study of the books, dissertations, research journals, and other sources of information on the issue to be examined. Certain research techniques, such as content analysis and meta-analysis, are useful in assisting researchers in reaching conclusions through the evaluation of relevant literature.

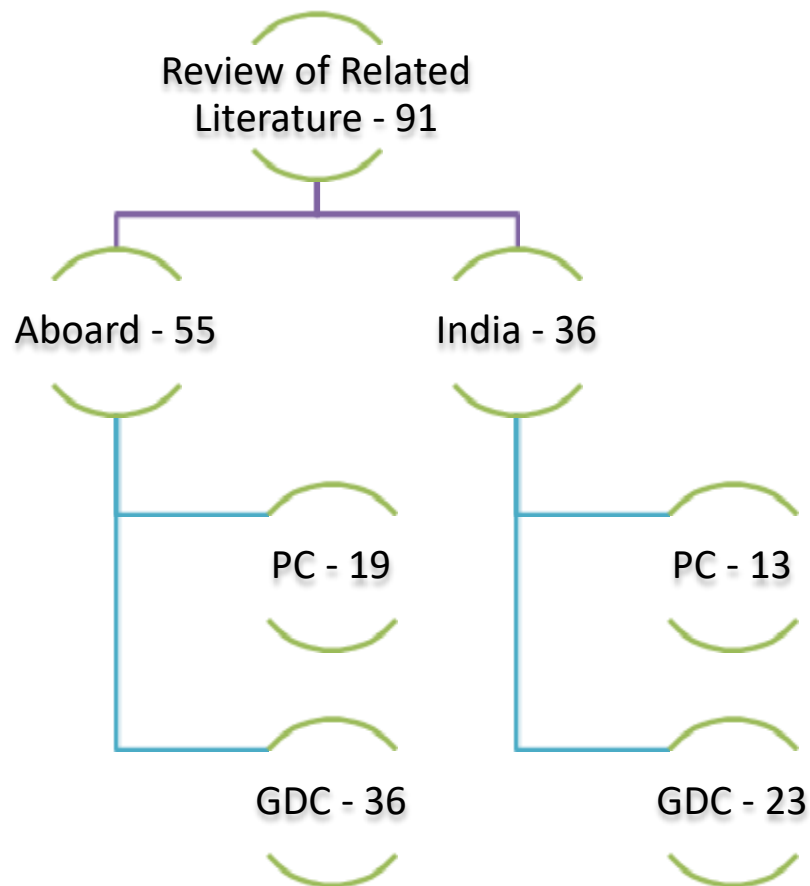
This chapter reviews several research studies on the perception, access, and use of Web-based learning in general and professional colleges across national and international contexts.

The review of related literature has been divided into two categories: Studies abroad and studies conducted in India. The study consists of 92 articles; 33 papers are related to professional degree colleges and 59 papers are related to general degree colleges.

Out of the 91 reviewed articles, 55 reviews of related literature were from abroad, with 19 articles based on professional colleges and 36 articles based on general degrees; and 36 reviews of related literature within India, with 13 articles based on professional colleges and 23 articles based on general degree colleges.

Figure 2.1

Layout of Review of Related Literature



PG: Professional Colleges GDC: General Degree Colleges

2.2 Studies Abroad:

Professional Colleges outside India

Castillo et al. (2024) in their paper ‘Analyzing the teaching profile and competency-based training in online education: a case study of Ecuadorian professors’ highlight that the rapid global shift to online education, driven by recent worldwide developments, has underscored the pressing need for teachers to adapt and enhance their skills in this evolving landscape. However, despite this urgency, many educators face challenges such as technical difficulties and a lack of familiarity with digital tools, which hinder their effectiveness. While students—especially younger

ones—tend to adapt quickly to online learning, persistent issues like the digital divide and unequal access to reliable devices and internet connections create disparities in learning opportunities. This inequality is particularly pronounced in developing nations and remote regions, where inadequate infrastructure remains a major obstacle to equitable education.

Hennekeuser et al. (2024) in their paper ‘The Impact of Artificial Intelligence n Personalized Learning in Higher Education: A Systematic Review’ highlight, AI can adapt educational content, pace, and instructional methods to the unique needs of individual students. This means that a student struggling with a particular concept in engineering, for example, might receive additional AI-driven tutorials or practice problems, while another student excelling in that area might be presented with more advanced challenges or real-world case studies. This tailored approach allows students to learn at their own pace and focus on areas where they need the most support or advanced development, directly contributing to skill acquisition.

Baticulon et al. (2021) conducted a study on ‘Barriers to Online Learning in the Time of COVID-19: A National Survey of Medical Students in the Philippines’. Five categories were used in the study to categorize the hurdles: technological, individual, home, institutional, and communal barriers. It was discovered that medical students encountered a number of interconnected difficulties when attempting to adjust to online learning. The majority of the pupils regularly experienced inadequate communication between teachers and students, needing to do tasks at home, and trouble adjusting to different learning styles.

Schoenfeld-Tacher and Dorman (2021) researched ‘Effect of Delivery Format on Student Outcomes and Perceptions of a Veterinary Medicine Course: Synchronous Versus Asynchronous Learning’ and found that the academic performance of the students was not affected by the delivery method. One of the barriers in the asynchronous course was the lack of an instructor. As the study showed, the result suggested that although some veterinary perceived the change in delivery format negatively, the method of delivery did not badly affect the performance of the students of pre-clinical courses.

Ayoub et al. (2020) in their article ‘The Online Learning in Medical Education: A Novel Challenge in the Era of Covid-19 Pandemic’ highlighted that online learning has its own advantages relating to its flexibility and the capacity for learning as it is self-paced. Traditional lectures are changed by virtual lectures in several medical fields. In the meantime, online learning has also faced certain complexities comprising lack of time and poor technical skills of their resources, insufficient infrastructure, and the lack of development approaches of the universities.

Dost et al. (2020) in their research paper ‘Perceptions of medical students towards online teaching during the COVID-19 pandemic: a national cross-sectional survey of 2721 UK medical students’ stated that a significant difference was found between time spent on online platforms before and during COVID-19. One of the most widely recognized advantages of online learning environments is their adaptability. However, bad internet connections and family distractions were often cited as obstacles to adopting online education platforms.

Selvaras (2019) in her work, ‘Technology Usage for Teaching and Learning Law in Open and Distance Learning: a Sri Lankan Perspective’ highlighted that the majority of the participants have access to technology through mobile phones and are conscious of blended learning. Even though they would rather prefer blended learning with legal education, they do not like learning entirely online. Social media and smartphone apps were the favorite learning platforms chosen by students. The internal staff is recognized for having access to and understanding of technology in legal education, but the external personnel confronts difficulties and requires sufficient training.

Puspitasari et al. (2018), in their research work ‘Utilizing Web-Based Learning as 21st Century Learning Media for Vocational Education’, examined the development of information technology, which focused on using web-based learning as a medium of vocational education. Students may learn more quickly and easily with web-based learning activities that are more flexible, interactive, and productive. Web-based learning is a type of learning that necessitates using technology, namely information technology like computers, smartphones, and internet connection. Therefore,

learning principles and communication should be developed in a manner similar to conventional or traditional learning. In practice, web-based learning uses online resources, including newsgroups, e-mail, websites, and mailing lists, to give information (material) learning. Web-based technology planning and execution have a significant positive impact on education. When implementing web-based learning, several variables need to be considered, including prices, the readiness of online materials for users (students, teachers, and experts), and supporting facilities and infrastructure.

Chong et al. (2016) studied ‘Access to, Interest in and Attitude toward e-learning for continuous education among Malaysian nurses. They found that most nurses could access a personal or home computer for work. Even though they had no prior e-learning experience, many nurses expressed interest in participating in e-learning activities. The number of computer hours used on average each week was surprisingly low. The study revealed that the majority of nurses had favorable opinions of online education.

Artemiou et al. (2014) reviewed some articles regarding medical or veterinary undergraduate to clinical or residency-level students. Their paper ‘Informing Web-Based Communication Curricula in Veterinary Education: A Systematic Review of Web-Based Methods Used for Teaching and Assessing Clinical Communication in Medical Education’ appreciated positive changes related to information-gathering in consultation with noted improvements in knowledge and clinical reasoning. The comprehensive research also shows the effectiveness of Web-based Learning in human medical education, suggesting the veterinary communication curriculum may have lost out on this educational opportunity. Furthermore, it was observed that the students perceived Virtual Patients as a legitimate and advantageous learning opportunity that enhanced their self-assurance. This trait has a good impact on learning.

Lahti et al. (2014) studied ‘Knowledge transfer from an e-learning course to clinical practice’. According to the study, the nurses understood the course topics, communicated and cooperated with other staff members, were aware of preventive

and alternative treatment approaches, and were capable of applying critical thinking to their jobs. After learning how to use an e-learning course to clinical practice, the nurses were able to identify areas for improvement, including problems with staff members' daily work, the patient's role on the ward, alternate techniques to avoid coercion, problems with the ward's care environment, issues with psychiatric nurses' education, and creating an action plan for aggressive situations.

Jude and Dankaro (2012) conducted research on 'ICT Resource Utilization, Availability and Accessibility by Teacher Educators for Instructional Development in College of Education Katsina Ala' and found that ICT resources were not sufficient; that is the reason why teacher educators could not access them for instructional development purposes. The researcher recommended that teacher educators' institutions should be well equipped with ICT resources and that sponsorship should be practiced for training and retraining programmes to produce submissive products.

Roshier et al. (2011), in their article 'Veterinary students' usage and perception of video teaching resources', revealed that the students had a positive perception of using video resources in higher education. A number of students disclosed the vital matter of using video teaching resources: (i) sound quality, (ii) accessibility-location of videos within electronic libraries, and (iii) content of video.

Koch et al. (2010), in their research 'Nursing students' perception of a web-based intervention to support learning,' discovered that students saw Web-based treatments as helpful for language development and learning when they were added to a traditional nursing science course. While they appreciated interactive, multi-media instruction, students were not prepared to give up on more conventional teaching methods like in-person lectures.

Hopper and Johns (2007) intended to describe the scope and online research potential in respiratory care through their paper 'Educational Technology Integration and Distance Learning in Respiratory Care: Practices and Attitudes'. The findings indicated that many program directors and faculty members used personal digital assistants (PDAs), and the managers thought it was suitable to employ online

technology for continuing education. If the program includes in-person teaching, both groups (managers and program directors) evaluate bachelor's or higher degrees earned through remote learning. In general, views about distant learning have improved as a result of the online learning experience and involvement.

Simsek et al. (2007), in their research paper 'Perceptions of Pre-service Teachers about Web Based Learning', expressed that even though most of the students (91%) didn't take any web-based course, they (81%) are comfortable with the European Computer Driving License (ECDL). At the same time, they still favoured speaking with their teachers in person at the same moment. The majority of students expressed unfavorable opinions about their experiences taking computer literacy classes remotely, despite blended learning being available.

Masic et al. (2006) in their papers 'Web-Based distance learning at faculty of medicine of Sarajevo University' highlighted that distance learning in medicine has an impact on telemedicine and practicing medicine as well. "Possibilities of introducing distance learning in the medical curriculum" was approved by the Federal and the Cantonal Ministry of Science and Technology at the Medical Faculty of the University of Sarajevo for Medical Informatics in 2002.

Morrison et al. (2001) in their studies 'A National Web Site for Residents as Teachers' stated that preliminary feedback on the Web Site has been strongly positive. It was revealed that the used of Web-based applications was considered to enhance and improve their residents' teaching skills.

White et al. (2001), in their article 'MEOW: A Web site to improve consistency and communication in clerkship,' found that the students have encouraged the use of the Web through clinical exercises, interactive bulletin board discussions, and the Internet-based patient log. However, the clerkship directors frequently struggle with a shortage of time and insufficient knowledge of how to post and maintain content on the Internet.

General Degree Colleges outside India

Wiitavaara and Widar (2025) studied ‘Challenges and opportunities in online higher education’ and found that online learning places increased demands on students, particularly in terms of self-leadership, social skills, and digital competence, more so than traditional on-campus studies. This is largely due to the nature of remote communication and social interaction, as well as the varied home study environments students’ experience. These findings underscore the importance of student awareness and support for developing effective self-regulation strategies. This includes guidance on study planning, time management, and assignment execution. Additionally, the study emphasizes the need for instructors to be mindful of fostering a sense of community in online courses, moving beyond a sole focus on tasks to create a more engaging and connected learning environment.

Akpen et al. (2024) conducted a study on ‘Impact of online learning on students’ performance and engagement: a systematic review’ and the study shows that online learning has had varied effects on students' academic performance and engagement. For some, the flexibility and accessibility of online formats have led to improved academic results, allowing them to learn at their own pace. However, other studies point to significant challenges, including decreased engagement, feelings of isolation, and reduced interaction with both instructors and classmates. The overall effectiveness of online learning hinges on several key factors: the quality of digital tools, reliable internet access, and strong student motivation. A consistent challenge in online education is maintaining student engagement. Studies suggest that incorporating interactive elements like discussion forums and multimedia resources, alongside meaningful instructor-student interactions, are crucial strategies for boosting both student engagement and academic performance.

Capinding (2024) study, ‘Online Teaching Effectiveness and Teacher's Readiness: Impact on Student Satisfaction and Academic Performance’, established three key findings: (i) a significant positive correlation exists between faculty preparedness for digital instruction and the effectiveness of online teaching methodologies. (ii) These factors collectively influence both student satisfaction levels and academic outcomes,

and (iii) Persistent challenges remain in pedagogical adaptation during the shift from traditional to online formats.

Rafiq et al. (2024) studied, ‘The Impact of Digital Tools and Online Learning Platforms on Higher Education Learning Outcomes’ stating that digital tools meaningfully boost student engagement, motivation, and academic results. However, their full potential is often limited by issues like technical problems, restricted access to resources, and inadequate training. To truly leverage these platforms, the study emphasizes the need for better technical support, ongoing professional development for educators and students, and strong institutional backing.

Chaudary et al. (2023) conducted research on ‘The Effectiveness of Online Learning in The Emerging Academics Environment: A Structural Equation Modeling (SEM) Approach’ and found that the relationship between the faculty viewpoint, students’ perspective, technology perspective, and the efficacy of online learning is significantly mediated by perceived ease of use. The finding highlights the importance of user experience and how simple it is for people to connect with online learning systems; determining how effective online education is overall. In order to maximize the educational results of online learning environments and increase user happiness, these findings provide insightful information that can be used to improve the design and implementation of online learning systems. Since technology is still a major component of modern education, it is critical to comprehend how a student’s perception of use affects the creation of successful online learning environments. Subsequent investigations might explore certain aspects that enhance the perceived ease of use, therefore expanding our comprehension of the complex relationships between user viewpoints and the efficacy of online learning.

Watson et al. (2023) in their study ‘Student and faculty perceptions of the effectiveness of online teaching modalities’ highlighted that there were significant differences as well as similarities among the students' and faculties’ perceptions of the effectiveness of online teaching modalities. While teachers thought that assigned readings and synchronous lectures were just as successful as pre-recorded lectures, students made it evident that they preferred the latter. Faculty members evaluated

synchronous activities, including case studies and student presentations, as more effective than students did. Both groups said that educational games, particularly quizzes, were very effective.

Martin and Bolliger (2022) on their paper ‘Engagement matters: Student perceptions on the importance of engagement strategies in the online learning environment’ highlight the critical role of engagement strategies in online learning, stressing that students' perceptions of engagement directly influence their satisfaction, motivation, and academic success. Their findings indicate that strategies such as introductory discussions, group activities facilitated by digital tools, consistent instructor communication, and transparent grading criteria strengthen interactions between learners, instructors, and course materials—key factors in enhancing outcomes in web-based learning (WBL). This demonstrates that merely transferring content online is inadequate; successful WBL demands deliberate instructional design that promotes meaningful participation.

Yahiaou et al. (2022) conducted research on ‘The Impact of e-learning Systems on Motivating Students and Enhancing Their Outcomes During COVID-19: A Mixed-Method Approach’ and showed that e-learning systems (technical and electronic requirements, personal requirements, perceived value, and creditability of e-Learning) have a significant impact on student outcomes (knowledge, skills, and attitudes) as well as student motivation (attention, relevance, confidence, and satisfaction).

Iqbal, Tariq and Ahmad (2021) researched ‘Student Challenges in Access to Digital Resources in Higher Education Institutes of Pakistan’ and a variety of issues and challenges were found that users encountered when using online databases from libraries and other digital resources. These included limited access to digital resources, a lack of user expertise, unreliable information, inefficient database layouts, information management, slow internet download speeds, and data security.

Means et al. (2021) in their research work ‘The effectiveness of online and blended learning: A meta-analysis’ provides robust evidence supporting the efficacy of

blended learning models. They found that these hybrid approaches, which strategically combine online and in-person instruction, often lead to superior academic performance compared to purely online or entirely traditional courses.

Vahedi et al. (2019) in their paper ‘Students’ use of information and communication technologies in the classroom: Uses, restriction and integration’ showed that students use smartphones and laptops for sharing information and communicating with their classmates for non-academic purposes in the classroom. It was also found that most students had negative attitudes concerning policies that would confine the use of information and communication technology in the classroom; but, had a positive perception to use and incorporate information and communication technology in the classroom.

Hamzah et al. (2017), in their study ‘Web-Based Learning Environment Based on Students’ Needs,’ indicated that the characteristics of a web-based learning environment support students’ needs in the process of learning on online discussion forums, lecture notes, assignments, portfolios, and chats. The students irresistibly agreed that an online discussion environment is the highest prerequisite because the tool can provide a room for students and teachers to share knowledge and experiences related to teaching and learning.

Schindler et al. (2017) in their paper ‘Computer-based technology and student engagement: a critical review of the literature’ used five technologies for post-literature search, i.e. web-conferencing, blogs, wikis, social networking sites and digital games. From their critical review, it was found that students’ use of the current models was impacted by computer-based technologies. Facebook, online conferencing, and digital gaming had the greatest overall impacts on a variety of student engagement kinds and metrics. However, because they have a small meaningful impact on students’ involvement, blogs, wikis, and Twitter were judged to be less persuasive with respect to engagement markers or mixed findings. The majority of the technologies under evaluation had a favorable impact on a number of student engagement metrics, which might result in a higher return on investment in terms of academic results.

Lyashenko (2016) in her paper ‘Implementation of Web-Based Technologies into Teaching and Learning Practices in the University’ dwells on the application of social media as web-based technologies in the education community. She thought of social media as an application in the university system, both at the macro and local levels. Web-based technologies are seen as tools for motivation that entice students to engage cognitively, emotionally, and behaviorally. They are distinguished by features including motivational appeal, content control, ease of usage and sharing, and innovation. The researcher thought that the user or students could overcome the challenges they experienced provided the e-learning technology and components were well-balanced.

Sun and Chen (2016) in their paper ‘Online Learning and Its Effective Practice: A Research Review’ highlighted that the development of an online learning community, motivated student-teacher interaction, well-prepared and fully-supported teachers, well-designed course materials, and the quick evolution of technology are all necessary for effective online education. It is intended that by doing this, a continuing conversation on useful tactics that might improve college and faculty effectiveness while switching to online instruction can be sparked. The probability of improving higher education, student enrolment, and retention in light of the ongoing discussions about the expense and quality of post-secondary education are also emphasized in this study.

Ghavifekr and Rosdy (2015) studied ‘Teaching and Learning with Technology: Effectiveness of ICT Integration in Schools’ aiming to analyze teachers’ perceptions of the effectiveness of ICT Integration in supporting the teaching and learning process in the classroom. The findings showed that ICT integration is quite effective for both teachers and students. The results show that one of the key elements contributing to the success of technology-based teaching and learning was teachers’ well-equipped preparation with ICT tools and facilities. Adding to this, it was shown that teacher professional development training programmes were crucial in improving the quality of education that students received.

Cho et al. (2014) in their work 'Review of Research on Online Learning Environments in Higher Education' grouped research topics into 3 major themes:

- i. Participants (demographic, cognitive, affective, intrapersonal and interpersonal)
- ii. Micro-level environments (content, technology, instructional model and strategy, peer interaction and assessment)
- iii. Macro-level environments. (theory & perspectives, IT infrastructure & diffusion, administration, professional development, open educational resources and communities)

They aimed to analyze existing literature in order to give a summary of theoretical and practical concerns related to OLEs. The study's findings demonstrated how social beings like individual students engage with their surroundings on both a micro and macro level, which are interconnected. It also demonstrated how research on online learning environments in higher education has looked at macro-level settings, which involve a variety of socio-cultural concerns outside the scope of a particular course, in addition to participants and micro-level surroundings. Throughout the examination, a wide range of OLE research topics based on several disciplines are discovered. The subjects of ethnography, comparative education, lifelong learning, and educational policy have also been extensively explored in macro settings.

El-Seoud et al. (2014) in their research 'E-Learning and Students' Motivation: A Research Study on the Effect of E-Learning on Higher Education' aimed at measuring to what level e-learning increases and prompts the undergraduate students for this learning course. British University and Helwan University introduced e-learning as a tool to support traditional face-to-face lectures. And they have pertinent experience with the online learning system. The study showed that the utilization of interactive features of e-learning among undergraduate students motivates the learning process. It was also brought to the attention of academic staff members how valuable interactive e-learning capabilities may be while instructing adult students.

Okeke et al. (2014) conducted a study on ‘Availability and Uses of ICT among Students in Faculty of Social Science, Madonna University, Okija’. The high percentage of illiteracy among students utilizing the institution’s ICT resources prompted the conduct of the study. The findings indicated that a large number of children picked up computers and other ICT skills at home because the school administration forbids social media use for any purpose. Additionally, it was shown that although students are disadvantaged, ICT resources assist them with assignments, research, making friends, and participating in other social activities in the classroom or community. In addition, it prompted the researcher to offer some suggestions to the school administration on the requirements for ICT usage by pupils in the twenty-first century.

Popivici and Mironov (2014) investigated their studies about ‘Students’ perception of using eLearning technologies’ and observed that a positive perception of using eLearning technologies was found. It was found that students were deeply aware of the transition made by digital technologies; the impact on the learning process can be seen in their work. Also, it is clear that technologies were well equipped and students were given formal environments; and they already used these technologies to support their learning process. Furthermore, students seem to understand that a more rational advance based on specific developments might prove even more effective.

Nordin and Alias (2013) conducted a study on ‘Web-Based Teaching and Learning Approach (WBTLA) Usability in Institutions of Higher Learning in Malaysia’. The study showed that lecturers acknowledged the use of technical and pedagogical techniques and its dimension is encouraged. On the other hand, most of the lecturers have certain problems with contextual usability as they were unable to receive ample e-learning facilities, services and safeguarding as is needed for conducting the WBTLA. Not considering the difficulty they faced, the lecturer believes that WBTLA has good prospects shortly.

Simpson (2012), in her study ‘Student Perceptions of Quality and Satisfaction in Online Education,’ reveals the statistical significance of students being more

comfortable with distance learning and having higher satisfaction with their online courses.

Trukhacheva and Pupyrev (2012), in their article ‘Blended-Learning Strategy in the Altay State Medical University’, highlighted that students saw e-learning as a forming part of the blended-learning strategy, not as a replacement of traditional instructor-led training and complement it. Advances in e-learning technology heralded a revolution in education by assigning learning as personalized (adaptive learning), enhancing student’s social connections (collaborative learning), and changing the nature of the instructor position. Integrating e-learning into medical education hastened the transition from material distribution to the application of adult learning theory, where educators now play the roles of facilitators and competency assessors. The study examined the potential applications of e-learning in medical education and the necessary next steps.

Abdelaziz et al. (2011) studied ‘Evaluation of E-Learning program versus traditional lecture instruction for undergraduate nursing students in a faculty of nursing’. It was found that computer facilities were limited, so there was no effective communication between the instructor and the students. The students did not wish to continue the e-learning program as there was no sufficient computer and internet connection.

Usta (2011) study, ‘The effect of web-based learning environments on the attitudes of students regarding computers and the Internet, ’ found no significant difference between students' attitude scores towards the internet and computers when traditional education was compared with web-based education.

Moseley (2010), conducted a research on ‘Student and faculty perceptions of technology’s usefulness in community college general education courses’, and found that the students had a positive perception of technology used. In the context of their quantitative replies, students stated that they would want more technology utilized in the classroom and believed that technologies used more frequently were also more beneficial for learning. Students consider the internet, video, and PowerPoint to be beneficial technologies in their studies.

Trpkovska (2010) conducted a study on the topic 'A study of information technology use among students at South East European University' among 3rd-year undergraduate students comprising 250 participants. A 17-item online email questionnaire was utilized to gather information about the student's expectations, preferences, and views. The study's objective was to provide better education by evaluating the state of information technology use today and presenting several ideas for development. According to this study, students are more at ease utilizing information technology for communication, learning and connecting to the processes involved in education. It also showed that a considerable improvement in several techniques was observed during the trial. The pupils believed that instruction in the use of information technology was necessary.

Surry et al. (2009), in their research work 'Implementation of web-based learning in colleges of education: Barriers and enablers', showed that Education faculty had an overall neutral position in implementing web-based learning in the colleges. Equity in finance, capital goods, and support were seen as barriers to implementation. Cultural organization, scheme, commitment to learning, and evaluation were seen as enablers of web-based learning applications.

Barbour (2008) researched 'Secondary students' Perception of Web-Based Learning'. The findings showed that students were satisfied with their virtual schooling experiences.

Kelly et al. (2007) conducted a study on 'Comparing Web-based to Traditional Instruction for Teaching Special Education Content'. Significant differences were discovered among the two groups (web-based section and conventional section) based on the pre-test and post-test results; no significant differences were found between the groups. The findings showed that the two student groups had comparable starting points for their knowledge and similar endpoints for their knowledge acquisition. There were no discernible differences in the two groups' perspectives. The results showed that pre-service teachers may effectively receive unique education course content using Web-based training.

Smart and Cappel (2006) conducted a research study on ‘Students’ Perceptions of Online Learning: A comparative study’ in which online learning and traditional learning were integrated among two undergraduate business courses where students complete online learning modules preceding class discussion. The results showed that participants in an elective course rated the online learning system significantly better than those in the required course. Generally, participants in the elective course rated the online learning system marginally positive, while those in the required course rated marginally negative. The results also showed that for most participants (83%), the online learning module was their first experience completing an online learning activity.

Fung et al. (2005), in their project, ‘The application of Web-based teaching and learning in tertiary institutions – a case study in Hong Kong’, found that over 80% of the students used Web-based teaching and were satisfied with it. According to the study, students developed more positive views of the courses and their lecturers. According to the survey results, improved quality of students and teachers and online learning cannot be ignored and should be adopted in tertiary settings.

Sengel (2005), in his case study ‘Effect of Web-Based Learning Tool on Student Learning in Science Education: A Case Study’, found significant differences between the pre-tests and post-tests on the achievement test and attitude scale on science students. The following results were found in the study:

- (i) There is a positive relationship between site usage time, achievement, and the attitude of the science students towards their learning.
- (ii) The website provided a number of courses; students accessed the Internet, completed assignments, and took online exams, as shown in the study.
- (iii) The students preferred to work together with their friends via e-mail, SMS, and chat rooms.

Poon et al. (2004) observed ‘A study of Web-based learning environment in Malaysia’. They found that the five main factors that influenced the effectiveness of the online learning process were students’ behaviour, the characteristics of lectures,

interactive applications, technology or systems, and institutions. The study also showed a strong correlation between students' perceptions, levels of self-efficacy, and levels of interaction and their grades. It was discovered that traditional learners are not outperformed by web-based learning. It was discovered that there was a significant need to enhance the quality of the Web-based learning system or device since different learners have different adaption techniques.

Khalifa and Lam (2002), in their paper, “Web-based learning: Effects on learning process and outcome”, studied the relative effectiveness of two different types of Web-based environments: distributed passive learning (DPL) and distributed interactive learning (DIL). The report claims that linear learning resources like Word documents and PowerPoint presentations are only distributed via the web in DPL settings. However, in the DIL environment, the learning materials are given to the learner in a hypertext style, allowing for more exploration and engagement. An empirical examination undertaken for this publication also indicates that the DPL environment is inferior to the DIL environment regarding learning outcomes and processes.

Sebastian et al. (2001) studied ‘A Web-based Database for Sharing Educational Multimedia within and among Medical Schools’. They revealed that a Web-based interface was designed for uploading multimedia to a central server, enabling faculty to catalogue and systematize their personal collections. The image descriptions, keyword lists, and clinical data are stored in the database sections. The database is used as a resource by instructors and students, and it feeds into online tutorials, case studies, and tests. Multimedia may, therefore, be flexible in its repurposing to enhance evaluation, learning, and teaching.

2.3 Studies in India

Professional Colleges in India

Husain and Jahan (2025) conducted a research on ‘Challenges and Prospects of Online Learning during and Post Covid-19 Pandemic’ and observed that teachers had a perception related to quality parameters in online learning. Though students were

excited about using gadgets in learning, they found the traditional/conventional classes more interesting than those conducted online. Blended learning seemed to be the preferred mode of learning by the students. The teachers realized that apart from the cognitive aspect, the affective domain also matters even in higher education.

Suri (2025) studied 'Digital learning in higher education in India: An exploration of government initiatives at the University of Jammu', and the research highlights a significant shift towards digital learning platforms, with more students choosing online courses and digital resources. While these platforms support adaptable and immediate learning and broaden access to information globally, the study also investigates the difficulties and impediments to their effective adoption in higher education.

Faridi and Shaheen (2024) conducted a study on 'Online Learning Platforms and Teacher Efficacy. The findings reveal that online learning platforms and educational applications enhance teachers' effectiveness, instructional skills, subject knowledge, and student participation. Respondents mentioned various platforms used with differing frequency, such as Moodle, MOOC, Khan Academy, Edmodo, Byjus, Google Classroom, and Quizlet, among others. The results highlight the need for adequate training and assistance to successfully integrate these technologies into teaching practices. The study recommends incorporating online learning tools and educational apps into teacher training curricula, ensuring proper resources and support, and conducting in-depth research on their effects on teacher performance and student achievement.

Prathap (2024) in his research 'A Study of School Teachers on Adaptation to Online Education During 2024pandemic Period' stated that teachers in India are increasingly embracing online teaching methods, recognizing the value of technological advancements in education. While the pandemic initially necessitated a rapid shift to online instruction, many educators now appreciate its benefits, even as traditional classroom learning resumes. However, the effectiveness of teachers in web-based learning environments remains heavily reliant on their digital literacy and

the support they receive. Early on, many teachers grappled with technical difficulties and challenges in administering online exams and assessments.

Kakar and Majula (2022) researched the ‘Perception of Agriculture Teachers and Students about Utilization of ICT Tools in Agriculture Education’. The results showed that most teachers had a high perception of ICT tools and could use ICT tools effectively for teaching. The most utilized ICT tool was internet/ web services, and they also had high knowledge of e-mail. Most teachers prefer ICT tools as they save time are need-based and make it easy to gain knowledge. At the same time, they expressed that they lacked confidence in handling ICT tools and wanted to have proper training. The majority of the students had a high perception of ICT tools as technologies that are convenient to use and easy to store and retrieve information. The majority of the students had high knowledge of the use of MS PowerPoint, and the most used ICT tools were internet or web service. The students also used ICT tools to gain new knowledge in their education.

Mane and Subaveerapandiyan (2022), in their work, ‘Use of Electronics Resources by Law Academics in India,’ found that most (95%) of students are aware of e-resources, and most (76%) use college websites for accessing legal electronic resources. The Majority (95%) of the students favoured using Portable Document Format (PDF) for reading. Most students felt that e-resources are easy to access, time-saving, and search tools.

Uma and Kavitha (2021), in their research work, ‘A study on ICT usage pattern among students and faculty members in dental colleges in Kerala,’ found that browsing the internet, taking notes, recreation, reading journals and magazines has no significant difference among the students and faculty based on gender. It was found that most of the faculty had reported that their computer and internet expertise level was in the ‘Beginner’ stage. Among the students, the majority of them reported themselves as ‘Experts’ in handling computers and the Internet. A number of faculty members were satisfied with the collection of textbooks, while most students were not satisfied with the availability of textbooks.

Saiyad et al. (2020), in their article ‘Online Teaching in Medical Training: Establishing Good Online Teaching Practices from Cumulative Experience’, highlighted that online teaching is flexible and learner-centred and may help students become more adept at self-directed learning. It also has the ability to transcend regional barriers. The papers emphasize the following factors that are necessary for effective online learning: online teaching and learning must be in line with curriculum delivery and objectives; synchronous and asynchronous interactions between teachers and students; feedback must be given promptly; students’ diverse talents and learning styles must be respected; ongoing supervision and mentoring of the learners must be ensured; and students must participate in both formative and summative online assessments.

Venkatesh et al. (2019), in their work ‘Factors Influencing Medical Students’ Experiences and Satisfaction with Blended Integrated E-Learning,’ revealed that male students had significantly higher computer self-efficacy and overall learner satisfaction ratings than female students. The study showed that gender (student characteristics), performance expectations (cognitive factors), and learning climate (social environment) were predictors of learners’ perceived satisfaction.

Rani and Kant (2016), in their work ‘Integrating ICT in Teacher Education: A step towards quality education’, emphasized that ICT integration in teacher education is crucial to satisfy the requirement for their efficient teaching-learning process. Therefore, to create training programs that are both practical and successful, policymakers and teacher trainers must have a thorough understanding of the variables influencing the cost and effectiveness of various approaches for potential improvements. This paper emphasizes the specific roles of ICT. It highlights the need for increased attention to providing multimedia simulations of effective teaching practices, personalized training courses, support overcoming teacher isolation, ongoing connections between individual teachers and a larger teaching community, and teacher-to-teacher collaboration.

Gupta et al. (2015) conducted a study titled ‘A questionnaire-based study on student preparedness to web 2.0 at I MBBS entry-level’. They found that two predominant

constructs were determinants of students' preparedness. The findings showed that students were in favour of implementing Web 2.0 teaching.

Behera (2013), in his article 'E-Learning in Teacher Education', focused on the significance of E-Learning in the Teacher Education community. He stated that E-Learning developshigher-order skills, such as establishing connections across time and space. Digital resources and libraries can be accessed from any place at any time by students, teachers and professionals for their research and course material. Regarding its potential and significance in terms of flexibility, collaborative learning styles, catch-up notes, online communities, quality, retention, reusability, revision, multiple learning styles, virtual learning environments, and cutting-edge tools, e-learning is widely and fairly used in the teaching community.

Jerald (2010) studied 'Information and Communication Technology about their Self-Concept and Intelligence of B.Ed. Trainees in Puducherry Region. The purpose of the current study was to determine how B.Ed. Teacher trainees felt that information and communication technology were connected to their intelligence and self-concept—the B.Ed. Teacher trainees recognize the value of ICT in teaching and learning as well as in education more broadly. Compared to male teacher trainees, female teacher trainees exhibit more positive opinions regarding ICT, Self-Concept and Intelligence. In addition, it was discovered that teacher trainees in the arts had more positive sentiments about ICT than those in the sciences. It was found that teacher trainees with high self-concepts exhibited a more positive attitude towards ICT than did with low and medium self-concepts.

General Degree Colleges in India

Taneja et al. (2025) in their work, 'Covid-19 and Higher Education: Assessing the Challenges Faced by Students in India' stated that many students, especially those from rural areas and lower socio-economic backgrounds, lacked access to essential devices like laptops or even reliable smartphones capable of supporting online learning platforms.

Khan and Subhash (2024) conducted a study 'Factors Affecting Online Teaching: Teachers' Perspective' and specifically points out that internet issues and limited technical expertise significantly and negatively impacted the effectiveness of online teaching from the perspective of university teachers.

Khan et al. (2022) in their research work 'Students' Perception towards E-Learning during Covid-19 Pandemic in India: An Empirical Study', found that students have a positive perception of e-learning and have accepted the new education system. The study also revealed that educational institutions must be well-equipped with e-resources, and policymakers must take online learning practices to the next level.

Ramya and Poongodi (2022) researched 'A study on using information and communication technology (ICT) tools to improve the communicative competence of undergraduate students of select engineering colleges in Erode District'. It was found that the students' perception towards ICT was appreciable, and their listening ability was improved with the help of ICT tools.

Goswami et al. (2021) in their paper 'Impact of Online Learning in India: A Survey of University Students During the COVID-19 Crisis' showed that most students adapted quickly to online learning, with only 33.21% expressing dissatisfaction. However, marginalized groups—such as SC, ST, OBC, female, and rural students—faced greater challenges due to high-speed internet costs (78.20% cited this as a barrier), poor connectivity, and insufficient infrastructure (23.52% had to frequently share devices). A majority (76.47%) believed blended learning would be the future, while 88.92% recommended that the government provide free, high-quality video conferencing tools to reduce educational disparities exacerbated by online learning.

Prabakar and Sasikal (2021) studied 'Impact of Information and Communication Technology on Management of Resources in Degree College Libraries of North Andhra Pradesh' and found that nearly three-fourths of the campus was provided internet through LAN. Some of the campuses had Wi-fi connectivity. Most respondents were satisfied with the in-house database management and access. These databases were accessed through UGC-Infonet – NPTEL, N-List and DELNET.

Selvakumar and Majudeeswaran (2021) studied 'Awareness of information and communication technology infrastructure facilities to access e-resources among the research scholars of Bharathiar University affiliated colleges' and found that most residents were aware of the use of ICT. They used ICT daily by reading e-journals and e-books. Most of them used MALIBNET and EMARALD databases for their study area.

Kulal and Nayak (2020) researched 'A study on perception of teachers and students towards online classes in Dakshina Kannada and Udupi District'. It was found that the students were comfortable with online classes and found adequate support from their teachers. There was no doubt that online courses would replace traditional types of teaching. At the same time, the results showed that teachers faced specific problems while conducting online classes- lack of proper training and technical issues.

Dhanaseelan and Prabakaran (2018), in their research work 'Use of ICT Tools by Faculty Members of Arts and Science Colleges in Krishnagiri District' found that many (41%) teachers accessed ICT several times a week and the majority (82%) of them used ICT for collecting study materials. The results showed that a large number (61%) of teachers utilized it for entertainment, and a number (57%) of teachers used it for preparing themselves for seminars and conferences.

Vanlalruati (2018) studied 'E-Learning Practices among the students of Mizoram University'. The study intended to ascertain the students' perceptions about online learning, what resources were available to them, which resources they used, and why they used them. The study showed that students could work according to schedule and location and had no trouble utilizing and administering e-learning resources. However, they also want further training to increase their awareness and understanding. WebOpac, EDUSAT, e-journal, and e-ShodhSindhu are among the programs Mizoram University students can use to access e-resources on campus. The students frequently visited websites consulting for their academic work to collect pictures, learning materials, diagrams, assignments, etc., and they preferred to use softcopy to transfer learning material and share files. The study also showed that

many students used the Internet for educational purposes. However, the realistic use of e-resources is not up to the worth in comparison to investments made in acquiring the resources available.

Konwar (2017) focused on 'A Study on Attitude of College Students towards E-Learning concerning North Lakhimpur of Lakhimpur District, Assam'. It found that college students' gender or place of residence does not influence their attitudes toward online learning. It also showed that students who utilized e-learning as a learning approach had higher grades or percentages than those who used it less.

Thangamani and Nagavalli (2017) conducted a 'Status study on ICT education attitude of student teachers towards ICT and usage of available resources in colleges of education'. The results indicated that the student teachers had an average attitude towards ICT. They were highly proficient in using instructional films and moderately proficient in using databases, but they lacked proficiency in using software. The student teachers used Web 2.0 tools for interaction. E-journals, e-textbooks and asynchronous learning tools were used for access. ICT is used for sharing and disseminating information, preparing seminar papers, preparing assignments, chatting with friends, online shopping, entertainment and downloading learning materials. Mobile handsets were used to access tools such as dictionaries and mail immediately.

Agarwal (2016), in her article 'Integrating ICT in Teacher Education', highlighted that integrating ICT in the classroom would be beneficial for both the learner and the teacher, which includes the promotion of shared working space and resources, better access to information, the promotion of collaborative learning and radical new ways of teaching and learning. ICT used were eventually improved children's learning opportunities and foster their ability to think and respond creatively. She also felt that ICT helped pupils prepare for their plans and careers in an increasingly technological environment.

Pande et al. (2016), in their article 'Current Trends of E-Learning in India', aimed to provide a summary of current trends in the development of e-learning in India. Governments, corporations, and professional associations have begun concentrating

on applications and the successful and efficient use of e-learning in anticipation of this expansion. The article concluded by pointing out that subpar procurement procedures hinder the expansion and uptake of e-learning. Thus, it became evident that a thorough examination is required when selecting e-learning software for education to improve learner knowledge, learning outcomes, performance outcomes, business and policy effects, and to value the money spent.

Pandey et al. (2016) studied the usage of the ICAR Portal among students in North East India. They conducted a pilot study aiming to analyze the usage of the E-learning portal and other online resources among students in North East India. A comprehensive survey instrument was employed to gather information from 199 faculty members and students studying agriculture in North-Eastern India. It was discovered that more people were using the portal since it offers consistent course materials linked to the ICAR syllabus. To encourage students to access online materials, connectivity and infrastructure-related problems must be resolved. It also suggests creating a policy framework for the portal's development, planning, support, and ongoing assessment.

Srinivasaragavan et al. (2016), in their work, 'A Case Study of Internet Access and Usage by Undergraduate Students VEL TECH TECHNICAL University, India,' found that the majority of the respondents are Internet literate. Most of them use the Internet as a source of information and knowledge and communicate academic activities through e-mails, web pages, and chatting facilities.

Das (2015) studied the 'Effectiveness of Web-based Learning in Secondary School Education' to determine if Web-based teaching-learning significantly improved secondary school students' performance and compared the effectiveness of traditional teaching-learning with web-based learning using pre- and post-test measurements. The results showed that students' results from the pre-test to the post-test were significantly affected by the usage of Web-based learning. The findings also showed that web-based learning was more successful than traditional teaching and learning in secondary classrooms. Additionally, it was suggested that online instruction improved student learning.

Gaikwad and Randhir (2015) conducted a study on 'E-Learning in India: Wheel of Change'. The secondary data were assembled through books, periodicals, journals and published material related to E-Learning for the study. The study's objective is to comprehend the idea of e-learning and investigate its various forms. The study report emphasized e-learning and classroom instruction as India's main educational advancement wheel. The study found that e-learning is a valuable instrument for the growth of India's educational system. E-learning is acquiring knowledge outside a traditional classroom using electronic tools to access the curriculum.

Gaur et al. (2015) conducted a study called 'A Comparative Study of E-Learning Technique with Traditional Teaching Techniques' using questionnaires involving students, researchers, teachers, and other staff members, both male and female gender of different ages. The study demonstrated that all user categories had excellent feedback for e-learning strategies compared to traditional teaching methods.

Sharma et al. (2014), in their article 'E-Learning in India', concentrated on the Indian education scenario, presentation tools for e-learning, challenges faced by E-Learning in India, and the future of e-learning in India. A proposal was put out to use e-learning for informal and vocational training, which is highly effective for developing countries like India, where the majority of the people live in distant or rural areas and have minimal formal schooling.

Wasim et al. (2014), in their paper 'Web Based Learning', addressed the state of what teachers do to ensure the feasibility of the web used effectively to support both their teaching-learning and that of their students. As a result of the study, the tool's effectiveness and usefulness depend upon various factors, including the tool's design. Web-based learning in higher education offers several benefits, such as overcoming time and distance constraints, gaining economies of scale, and using innovative teaching techniques. However, the drawbacks include technological issues, upfront expenses, and social isolation. Many use web-based learning devices to provide online learning programmes and maintain and support formula curricula.

Imran (2012), in his article 'Trends and Issues of E-Learning in LIS-Education in India: A Pragmatic Perspective', stressed the importance of e-learning in higher

education with its extent and growth in Indian LIS education. The study stressed how important it is to view communications and information technology because – learning has emerged as the most cutting-edge tool for advancing education. It also became clear that e-learning is a teaching and learning method that uses ICTs to facilitate collaboration and communication inside an academic environment.

Sawant and Shinde (2011) researched ‘A study of Effect of Web-Based Education Environment in Schools: With special reference to Satara District’. The use of web-based education has been found to benefit from the research. Using animations, PowerPoint presentations, CDs, DVDs, or audio-visuals has a greater influence on the pupils than the conventional teaching-learning method. They typically have an easier time understanding the ideas. They found it easier to recall information or locate a specific lesson when web-based education was used. The study concludes that Web-based education is platform-independent, easily accessible, economical, has readily updated information, and works well with upcoming technology. High-quality education helps students who struggle with the application of computing and communication technology to overcome their issues.

The Analysis

This extensive review of literature provides a comprehensive overview of online education, encompassing its evolution, challenges, advantages, and the transformative role of technology, including AI. The studies span both international and Indian contexts, covering professional and general degree colleges.

The Transformation of Education through Online Learning

The rise of online education, greatly accelerated by recent global developments, has revolutionized the learning environment, requiring educators to adapt and students to develop new competencies. Unlike traditional classroom-based instruction, this shift places greater emphasis on self-discipline, interpersonal skills, and digital literacy, largely due to the remote nature of learning and varied home study conditions. However, the success of online education depends heavily on the availability of quality digital resources, reliable internet access, and student motivation.

Challenges in Online Education

Despite the rapid adoption of online learning, significant obstacles remain for both instructors and learners. Educators often struggle with technical issues and a lack of proficiency in digital tools, which hinder their teaching effectiveness. Dankaro (2012) noted the scarcity of ICT resources for teacher training, while White et al. (2021) found that educators faced time constraints and difficulties managing online content. In India, teachers have encountered challenges such as technical glitches and administering online exams (Khan & Subhash, 2024; Kulal & Nayak, 2020).

For students, the "digital divide" poses a major barrier, with disparities in access to devices and stable internet connections, particularly in developing regions and rural areas (Baticulon et al., 2021). Additional challenges include reduced engagement, isolation, and limited interaction with peers and instructors (Iqbal et al., 2021). Many Indian students, especially from disadvantaged backgrounds, lack essential technology (Taneja et al., 2025), while others face high internet costs and connectivity issues (Goswami et al., 2021). Even in blended learning settings, many students prefer in-person instruction, and the absence of direct instructor interaction in asynchronous courses has been identified as a drawback (Schoenfeld-Tacher & Dorman, 2021).

Benefits and Positive Views of Online Learning

Despite these challenges, online education offers notable advantages, including flexibility and self-paced learning. Studies highlight its adaptability, with digital tools enhancing learning efficiency (Artemiou et al., 2014). Virtual instruction has transformed medical education, and many Malaysian nurses expressed enthusiasm for e-learning (Chong et al., 2016). Research indicates that online learning can be as effective as traditional methods, with students benefiting from virtual simulations and web-based resources (Lahti et al., 2014; Roshier et al., 2011).

In India, students have shown interest in digital learning tools (Husain & Jahan, 2025), and educators recognize the value of technology in improving teaching and student engagement (Faridi & Shaheen, 2024). Many teachers use ICT tools effectively, though some require additional training (Kakar & Majula, 2022).

Students appreciate the convenience of e-resources and the flexibility of online learning (Mane & Subaveerapandiyam, 2022). Interactive features in e-learning enhance motivation (El-Seoud et al., 2014), and students generally view online education positively, with many satisfied with virtual courses (Fung et al., 2005).

The Impact of Technology and AI

Online education relies on digital tools such as computers, smartphones, and internet-based platforms (Puspitasari et al., 2018). AI has the potential to personalize learning by adjusting content and pacing to individual needs (Hennekeuser et al., 2024). Multimedia resources enhance teaching and assessment (Sebastian et al., 2001), while ICT integration fosters collaboration and innovation in education (Yahiaou et al., 2022).

Key Factors for Successful Online Learning

Effective online education requires robust infrastructure, educator training, and student support. Engagement strategies such as interactive discussions and instructor feedback are crucial for student success (Martin & Bolliger, 2022). Institutions must ensure reliable technology, professional development, and well-designed course materials (Sun & Chen, 2016). In India, blended learning is gaining popularity, though challenges like digital literacy and resource accessibility persist (Suri, 2025).

The Indian Context

Indian students and educators are increasingly embracing digital learning, though traditional classrooms remain preferred by some (Husain & Jahan, 2025). Teachers acknowledge the importance of digital skills but often lack confidence in using ICT tools (Kakar & Majula, 2022). Government initiatives and institutional support are essential for expanding e-learning in India (Khan et al., 2024). While many students adapt well to online education, issues like connectivity and device availability remain barriers (Goswami et al., 2021).

Overall, online education presents both opportunities and challenges, requiring continuous improvement in technology, training, and policy support to maximize its potential.

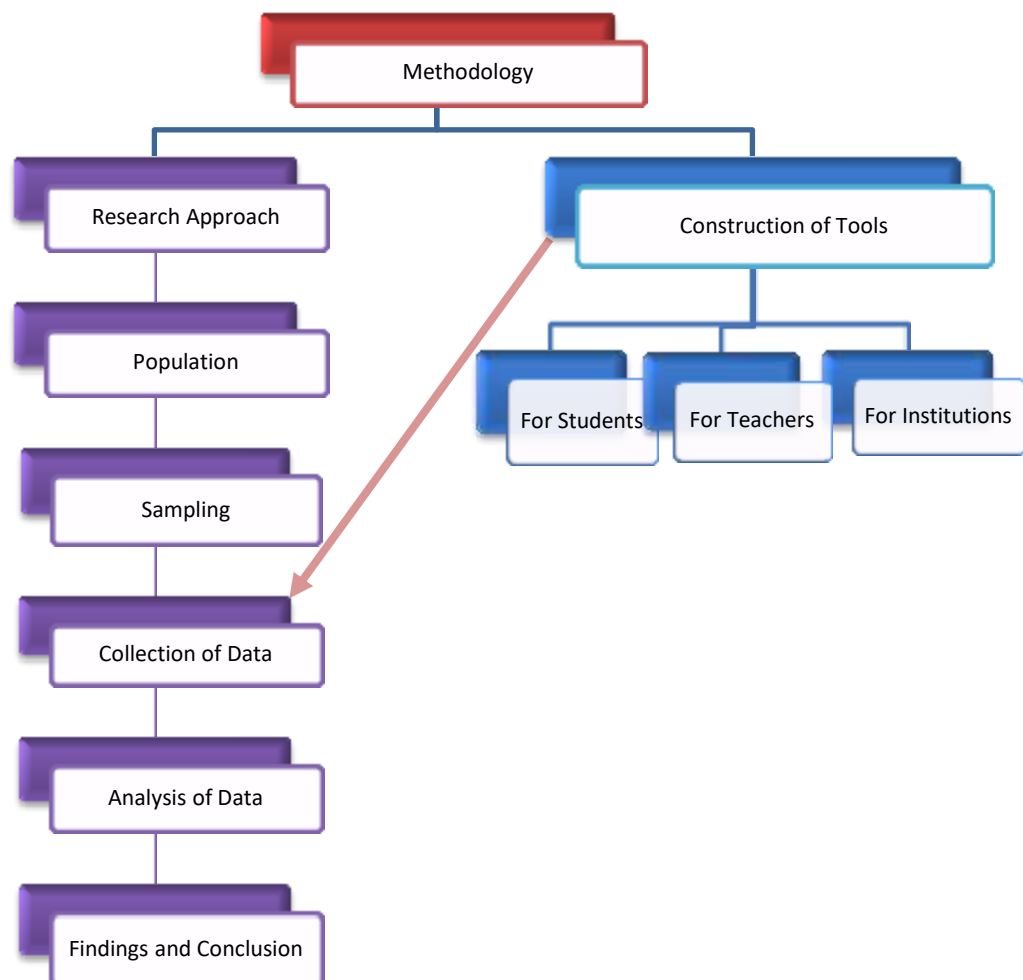
CHAPTER - III

METHODOLOGY OF THE STUDY

3.1 Introduction

This chapter explains the methodology used in this study. The methodological details are divided into six sections. Section 3.1 discusses the research approach, Section 3.2 covers the population, and Section 3.3 describes the study sample. Section 3.4 outlines the tools and techniques used for data collection. Sections 3.5 and 3.6 explain the data collection procedure and the statistical methods used to analyze the data.

Figure 3.1
Methodology of Study



3.2 Research Approach

The present research aimed to study the use of web-based learning among teachers and students of professional colleges and general degree colleges in Mizoram. The researcher attempted to ascertain the availability of e-resources in selected institutions, how accessible they were to teachers and students, their perceptions regarding web-based learning, how it was used, and whether perceptions and usages differed based on the type of institution, gender, and discipline. To achieve these objectives, a quantitative research method was adopted, which involves collecting measurable data and applying statistical, mathematical, or computational techniques for analysis (Fleetwood, 2023).

In this study, as per the nature of the objectives, the descriptive survey method was selected as a method of analysis using the quantitative research approach. Surveys and various forms of fact-finding inquiries are included in descriptive research. The primary purpose of descriptive research is to describe the state of affairs as it presently exists (Kothari, 2004). Descriptive survey research is oriented towards explaining the present status of a given phenomenon (Sharma, 2010). Therefore, a descriptive survey method was the best-suited method for this study (Best & Kahn, 2009).

3.3 Population

A population refers to all the individuals, cases, and objects, a researcher aims to study. It includes the aggregate or totality of all the objects, respondents or members that conform to a set of specifications, comprising the entire group of people that is of interest to the researcher and to whom the research results can be generalized (Polit & Hungler, 1999). Therefore, the population of this study comprises all the professional colleges and general degree colleges in Mizoram, including teachers and students at those colleges. The following tables (Table 3.1 and Table 3.2) specify the list of professional colleges and general degree colleges within Mizoram. As mentioned below, there were ten (10) professional colleges and twenty-two (22) general degree colleges in Mizoram. The teachers working and students

studying in various programs in all ten professional colleges and twenty-two general degree colleges were also two other sections of the population.

Table 3.1

List of Professional Colleges in Mizoram

Sl. No.	Colleges / Institutes	Location & Nature of Management
1	Medical College	Zoram Medical College, Falkawn (managed by the State Government)
2	Nursing Colleges	Mizoram College of Nursing (H&FW Dept., Mizoram Government)
3	Horticulture	Constituent College of Central Agriculture University, Imphal (Thenzawl)
4	Veterinary College/Institution	Constituent College of Central Agriculture University, Imphal (Selesih)
5	Para-medical Institute	RIPANS, Aizawl (managed and funded by the Central Government)
6	Law	Mizoram Law College, Aizawl (H&TE, Mizoram Government)
7	Teacher Training Institute/College	Institute of Advanced Studies in Education, Aizawl (H&TE, Mizoram Govt.)
8	Hindi Teacher Training Institute/College	Mizoram Hindi Training College, Durtlang North (H&TE, Mizoram Government)
9	Polytechnic Institutes	i. Mizoram Polytechnic Institutes, Lunglei Women's Polytechnic Institutes, Aizawl (managed and funded by H&TE, Mizoram Govt.)
10	National Institute of Electronics and Institute of Technology	Ministry of Electronics & Information Technology, Government of India

Table 3.2
List of General Degree Colleges in Mizoram

Sl. No.	Colleges / Institutes	Location & Nature of Management
1	Government Aizawl College	Affiliated to Mizoram University (managed and funded by H&TE), Aizawl
2	Government Aizawl North College	Affiliated to Mizoram University (managed and funded by H&TE), Aizawl
3	Government Aizawl West College	Affiliated to Mizoram University (managed and funded by H&TE), Aizawl
4	Government Champhai College	Affiliated to Mizoram University (managed and funded by H&TE), Champhai
5	Government Hnahthial College	Affiliated to Mizoram University (managed and funded by H&TE), Hnahthial
6	Government Hrangbana College	Affiliated to Mizoram University (managed and funded by H&TE), Aizawl
7	Government J. Buana College	Affiliated to Mizoram University (managed and funded by H&TE), Lunglei
8	Government J. Thankima College	Affiliated to Mizoram University (managed and funded by H&TE), Aizawl
9	Government Johnson College	Affiliated to Mizoram University (managed and funded by H&TE), Aizawl
10	Government Kamalanagar College	Affiliated to Mizoram University (managed and funded by H&TE), Chawngte
11	Government Khawzawl College	Affiliated to Mizoram University (managed and funded by H&TE), Khawzawl
12	Government Kolasib College	Affiliated to Mizoram University (managed and funded by H&TE), Kolasib
13	Government Lawngtlai College	Affiliated to Mizoram University (managed and funded by H&TE), Lawngtlai
14	Government Mamit College	Affiliated to Mizoram University (managed and funded by H&TE), Mamit

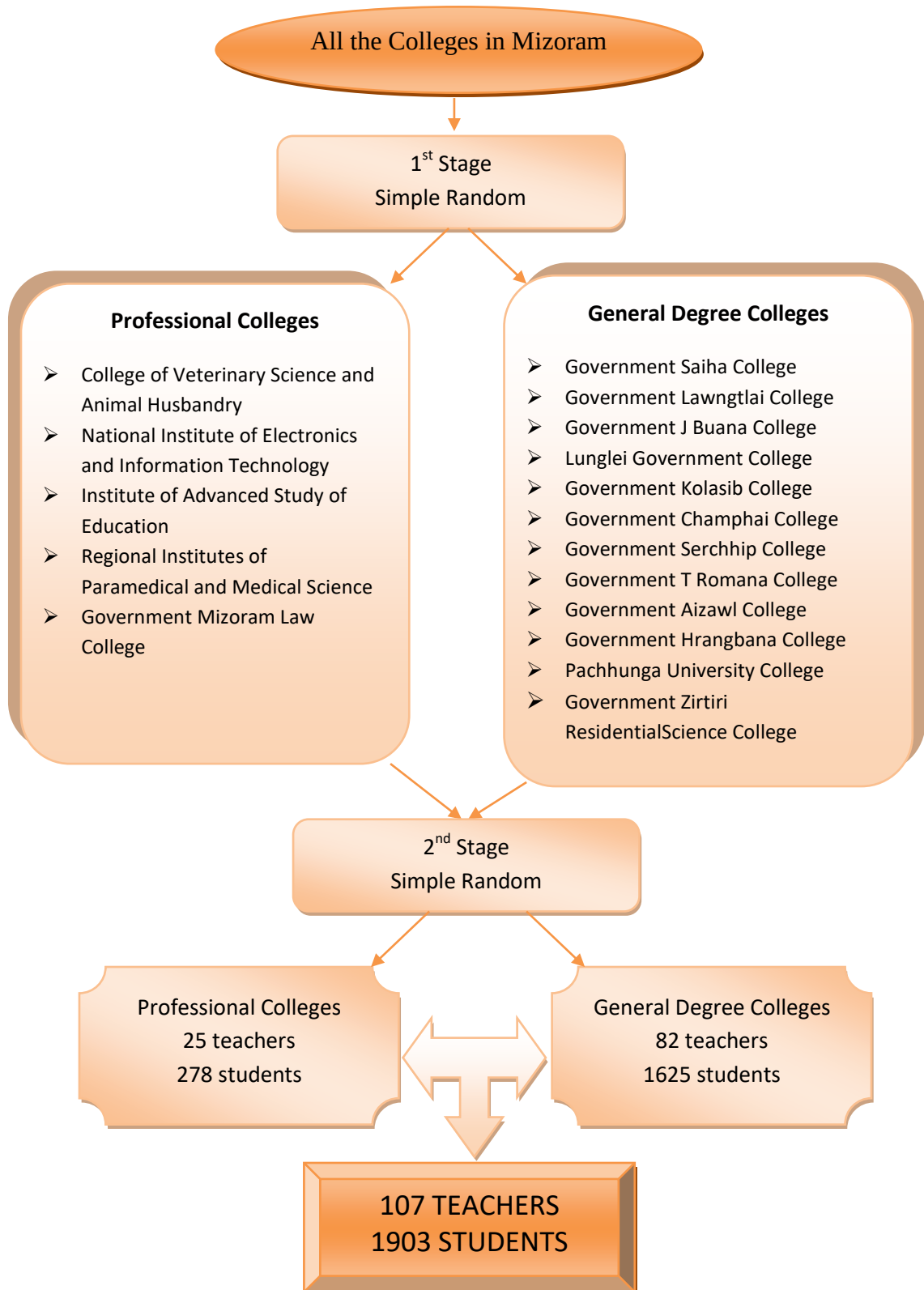
15	Government Saiha College	Affiliated to Mizoram University (managed and funded by H&TE), Siaha
16	Government Saitual College	Affiliated to Mizoram University (managed and funded by H&TE), Saitual
17	Government Serchhip College	Affiliated to Mizoram University (managed and funded by H&TE), Serchhip
18	Government T. Romana College	Affiliated to Mizoram University (managed and funded by H&TE), Aizawl
19	Government Zawlnuam College	Affiliated to Mizoram University (managed and funded by H&TE), Zawlnuam
20	Government Zirtiri Residential Science College	Affiliated to Mizoram University (managed and funded by H&TE), Aizawl
21	Lunglei Government College	Affiliated to Mizoram University (managed and funded by H&TE), Lunglei
22	Pachhunga University College	Affiliated with Mizoram University (managed and funded by Mizoram University), Aizawl

3.4 Sample and Sampling Technique

A sample is any number of people, objects, or subjects selected to represent the population according to some rule or plan; a sample is a more miniature representation of the population (Singh, 2011). In this study, the researcher adopted multi-stage sampling (Singh, 2011). Two or more stages of sample selection are included in multi-stage sampling, a more sophisticated type of cluster sampling. In multi-stage sampling a large population clusters are divided into smaller clusters in several stages to make primary data collection more manageable (Dudovskiy, 2023). The researchers used simple random sampling techniques for selecting participants so that any individual, taking any portion of a population as a representative of that population (Kerlinger, 2007), that is, teachers and students, had an equal probability of being selected from the population, The intention of choosing simple random sampling was for the selection of individuals who would be representative of the population (Creswell, 2003).

Figure 3.2

Layout of Multi-Stage Sampling



To select a representative number of samples, first, the researcher categorized professional colleges as per the offered program, such as RIPANS, IASE, GMLC, VSAH, and NIELIT. For some of the professional courses, only one institution was available. Therefore, the particular institution was selected automatically as there should be an adequate representation of each subset of the population. For the course, for which more than one college was available, a simple random sampling technique was adopted by the investigator. The selected list of professional colleges for the study can be seen in the given Table 3.3.

After selecting the colleges at the first stage, teachers and students from the chosen colleges were selected using a simple random sampling technique. An appropriate number of teachers and students from professional colleges and general degree colleges were selected.

Table 3.3

Professional Colleges - Sample distribution of Teachers and Students with regard to their Gender and Discipline

Sl. No.	Name of Colleges	Nos. of teachers		Total	Nos. of students		Total
		Male	Female		Male	Female	
1.	College of Veterinary Science and Animal Husbandry (VSAH)	3	2	5	22	13	35
2.	National Institute of Electronics and Information Technology (NIELIT)	3	1	4	36	6	42
3.	Institute of Advanced Study in Education (IASE)	3	3	6	35	73	108
4.	Regional Institutes of Paramedical and Nursing Sciences (RIPANS)	1	3	4	22	42	64
5.	Government Mizoram Law College (GMLC)	0	6	6	17	12	29
	Total	10	15	25	132	146	278

Table 3.3 displays the chosen sample of teachers and students from professional colleges. A total of 25 teachers were selected: five from the VSAH, four from the NIELIT, six from the IASE, four from RIPANS, and six from GMLC.

Out of 278 students from the professional colleges, 35 students were from the VSAH, 42 students were from the NIELIT, 108 students were from the IASE, 64 students were from RIPANS, and 29 students were from GMLC. The selected sample from Professional Colleges comprised ten male teachers, 15 female teachers, 132 male students and 146 female students.

For the general degree courses, the researcher again categorized general degree colleges according to the offered program, such as arts, science, commerce, and computer application. An appropriate number of colleges from each category, according to their population, were selected randomly to collect data related to the present study. The list of general degree colleges chosen through a simple random sampling technique can be seen in Table 3.4.

Table 3.4

**General Degree Colleges - Sample distribution of Teachers and Students with
regard to their Gender**

Sl. No.	Name of Colleges	Nos. of teachers		Total	Nos. of students		Total
		Male	Female		Male	Female	
1.	Government Saiha College	3	1	4	55	75	130
2.	Government Lawngtlai College	4	1	5	40	37	77
3.	Government J. Buana College	3	8	11	77	95	172
4.	Lunglei Government College	5	3	8	71	137	208
5.	Government Kolasib College	4	1	5	71	63	134
6.	Government Champhai College	6	6	12	64	77	141
7.	Government Serchhip College	5	1	6	60	55	115
8.	Government T. Romana College	2	3	5	53	70	123
9.	Government Aizawl College	0	4	4	93	96	189
10.	Government Hrangbana College	3	6	9	69	96	165
11.	Pachhunga University College	4	5	9	60	58	118
12.	Government Zirtiri Residential Science College	4	0	4	27	26	53
	Total	43	39	82	740	885	1625

The above table (Table 3.4) lists the number of teachers and students sampled from various general degree colleges. The sample included four teachers from Government Saiha College, five teachers from Government Lawngtlai College, eleven teachers from Government J.Buana College, eight teachers from Lunglei Government College, five teachers from Government Kolasib College, twelve teachers from Government Champhai College, six teachers from Government Serchhip College, five teachers from Government T.Romana College, four teachers from Government Aizawl College, nine teachers from Government Hrangbana College, nine teachers from Pachhunga University College, and four teachers from Government Residential Science College. There were 43 male and 39 female teachers among the 82 teachers sampled.

It can be seen from the same table that the selected sample of students included 130 students from Government Saiha College, 77 students from Government Lawngtlai College, 172 students from Government J.Buana College, 208 students from Lunglei Government College, 134 students from Government Kolasib College, 141 students from Government Champhai College, 115 students from Government Serchhip College, 123 students from Government T. Romana College, 189 students from Government Aizawl College, 165 students from Government Hrangbana College, 118 students from Pachhunga University College, and 53 students from Government Zirtiri Residential Science College. Out of 1625 students, there were 740 male and 885 female students.

Table 3.5
General Degree Colleges - Sample distribution of Teachers with regard to
Discipline

Sl. No.	Name of Colleges	Arts	Science	Commerce	BCA	Total
1	Government Saiha College	4	-	-	-	4
2	Government Lawngtlai College	5	-	-	-	5
3	Government J. Buana College	8	-	3	-	11
4	Lunglei Government College	5	3	-	-	8
5	Government Kolasib College	3	2	-	-	5
6	Government Champhai College	4	4	3	1	12
7	Government Serchhip College	2	4	-	-	6
8	Government T. Romana College	5	-	-	-	5
9	Government Aizawl College	4	-	-	-	4
10	Government Hrangbana College	6	-	3	-	9
11	Pachhunga University College	4	2	3	-	9
12	Government Zirtiri Residential Science College	-	4	-	-	4
	Total	50	19	12	1	82

The above table (Table 3.5) shows the total number of teachers selected for the present research from different general degree colleges studying in various disciplines. The study sample consists of 50 teachers from the arts stream, 19 teachers from the science stream, 12 students from the commerce stream, and 1 teacher from the computer application stream.

Table 3.6

**General Degree Colleges - Sample distribution of Students with regard to
Discipline**

Sl. No.	Name of Colleges	Arts	Science	Commerce	BCA	Total
1	Government Saiha College	130	-	-	-	130
2	Government Lawngtlai College	77	-	-	-	77
3	Government J. Buana College	104	-	68	-	172
4	Lunglei Government College	147	61	-	-	208
5	Government Kolasib College	85	38	-	11	134
6	Government Champhai College	59	46	36	-	141
7	Government Serchhip College	62	34	-	19	115
8	Government T. Romana College	123	-	-	-	123
9	Government Aizawl College	127	-	62	-	189
10	Government Hrangbana College	94	-	71	-	165
11	Pachhunga University College	37	39	42	-	118
12	Government Zirtiri Residential Science College	-	53	-	-	53
	Total	1045	271	279	30	1625

Table 3.6 shows the total number of students selected for the present research from different general degree colleges studying in various disciplines. The study sample consists of 1045 students from the arts stream, 271 from the science stream, 279 from the commerce stream and 30 from the computer application stream.

3.5 Tools Used for Data Collection

The primary purpose of data collection is to collect high-quality data that offers a potential answer to all the questions posed. It is an organized process of gathering and analyzing specific data to provide answers to relevant questions and to evaluate the outcomes. (Kothari & Garg, 2020). As the study's objectives indicated, the researcher tried to develop specific tools to collect the required primary data. The quality of the research depends mainly on the quality of the tools and methods used to collect information.

3.6 Construction of Tools:

The researcher used various questionnaires to construct tools from pertinent research work and articles through the library and the internet. Experts were consulted for establishing content validity.

As the aim of the research was to determine the availability of web-based learning resources in various academic institutions, access of teachers and students of higher education to web-based learning resources, and their perception regarding the adequacy of web-based learning and its uses, the researcher developed separate tools for each objective. The procedure for the development and standardization of the tool is mentioned below:

3.6.1 Tool 1: Checklist-cum-Observation Schedule to find out the Availability of Resources related to Web-based Learning in the Institution:

A checklist-cum-observation schedule was developed by the researcher to find out the availability of web-based resources in the professional colleges and general degree colleges in Mizoram.

3.6.1.1 Development of Items on Checklist-cum-Observation Schedule to find out the Availability of Resources related to Web-based Learning in the Institution:

For the development of this particular tool, the researcher reviewed some related literature to e-resources, ICT, and web-based learning. The first draft of checklist was consisted of 45 items. As per the suggestions of experts 30 items were removed and some of the items modified after consulting seven experts. The final version checklist consisted of 15 items finalized for the present study. The tool was including items related to availability of infrastructure, digital resources and software used for the delivery of the content. **(Appendix A)**

3.6.2 Tool 2: Questionnaire for Investigating Accessibility of Web-based Learning by Teachers in the Institution:

The researcher developed a questionnaire to investigate the accessibility of web-based learning among teachers of professional colleges and general degree colleges in Mizoram. The responses were categorized into two groups - facts and opinions.

3.6.2.1 Development of Items for Investigating Accessibility of Web-based Learning by Teachers in the Institution:

The researcher consulted various related literature to develop a questionnaire in search of accessibility of web-based learning and created the initial iteration of the questionnaire for teachers, consisting of 38 items. However, 8 items were removed, and two items were modified based on expert opinions, resulting in a final version consisting of 30 items. The questionnaire includes items such as experience with technology, internet usage and access patterns, institutional ICT integration, proficiency with software, teaching preference or methods using web-based learning platforms. Respondents were allowed to select their preferred response from the list of possibilities for each statement. **(Appendix B)**

3.6.2.2 Trying out Scale for Investigating Accessibility of Web-based Learning by Teachers in the Institution:

To ensure the quality of the questions about web-based learning, a first version of the question set (referred to as a ‘scale’) was created.

Subsequently, this set of questions was administered to 70 teachers who were selected from various colleges within Aizawl City. Clear instructions were provided to these teachers before they began the test.

After the 70 teachers from both professional and general degree colleges completed the administration of the test, an item analysis was conducted. This process involved a careful examination of each question to assess its performance and effectiveness.

3.6.2.3 Item Analysis for Investigating Accessibility of Web-based Learning by Teachers in the Institution:

The researcher applied item analysis, which investigates the performance of items considered individually either in relation to some external criterion or with regard to the remaining items on the test (Thompson & Levitov, 1985).

After administering the test related to accessing web-based learning to 70 teachers at professional and general degree colleges, scoring was performed. Following a descending sequence of scores, the top 27% and bottom 27% were reserved for item analysis. The t-test for each item was computed using the upper 27% and lower 27% of the data.

The mean and standard deviation were computed separately for the top and bottom groups. After this, statements with a t-value less than 2.05 or statements significant at the level of 0.05 were rejected, and those with a t-value above 2.75 or statements significant at the 0.01 level of confidence were kept for the final scale. Out of 30 statements, six were deemed unimportant or discarded, leaving 24 statements in the primary item. Table 3.7 provides the “t-value” and the mean and standard deviation values for the top and bottom groups on each of the 30 statements.

Table 3.7

**Mean, Standard Deviation and t-value of High and Low groups on different
Items of Web-based Learning Accessed by Teachers of Professional and
General Degree Colleges**

Item No	High Group		Low Group		t-value	Significance level
	Mean	SD	Mean	SD		
1	2.85	0.77	3.81	0.56	5.27	0.01
2	3.48	0.75	3.85	0.53	2.09	0.01
3	1.81	0.68	2.85	1.06	4.27	0.01
4	3.15	0.91	4.04	0.44	4.59	0.01
5	3.19	0.88	3.56	0.75	1.66	NS
6	2.52	0.85	3.56	0.64	5.07	0.01
7	2.48	0.80	3.19	0.88	3.07	0.01
8	2.78	0.93	3.37	0.69	2.66	0.01
9	3.56	0.80	3.93	0.68	1.84	NS
10	2.63	0.97	3.15	0.82	2.13	0.01
11	3.00	0.78	3.81	0.62	4.23	0.01
12	2.78	0.85	4.00	0.48	6.52	0.01
13	2.89	0.89	3.96	0.52	5.41	0.01
14	3.22	0.80	3.96	0.59	3.88	0.01
15	2.56	1.09	3.44	0.85	3.35	0.01
16	2.22	0.70	2.26	0.90	0.17	NS
17	3.70	0.67	3.85	0.72	0.78	NS
18	3.00	0.78	3.56	0.58	2.96	0.01
19	3.62	0.88	4.04	0.34	2.24	0.05
20	2.30	0.87	2.96	0.94	2.71	0.01
21	3.4	0.77	3.30	0.78	0.70	NS
22	3.81	0.74	4.48	0.51	3.87	0.01
23	2.04	0.90	3.04	0.90	4.09	0.01
24	3.74	0.76	4.04	0.71	1.48	NS
25	2.85	0.86	3.81	0.48	5.05	0.01
26	3.11	0.80	4.30	0.54	6.37	0.01
27	3.93	0.55	4.30	0.54	2.49	0.05
28	3.56	0.70	4.15	0.60	3.34	0.01
29	1.96	0.65	2.85	1.03	3.80	0.01
30	2.22	0.93	3.26	0.76	4.47	0.01

NS means Not Significant

3.6.2.4 Reliability for Investigating Accessibility of Web-based Learning by Teachers in the Institution:

The test-retest method, which measures the extent to which a measurement gives consistent results, was administered to test the reliability of the study. This method measures the correlation between two scores or equivalent tests from the same group. The correlation coefficient was interpreted using Pearson's Product-Moment Correlations for the data, which is on an interval scale; it is the most appropriate correlation method (Garrett, 2009).

Table 3.8

Interpretation of Pearson's Product-Moment Correlation

Sl. No.	Range of computed correlation coefficient	Interpretation
1	0 (zero value)	Zero relation, absolutely no relationship
2	0.00 to ± 0.20	Slight, almost negligible relationship
3	± 0.21 to ± 0.40	Low correlation, definite but small relationship
4	± 0.41 to ± 0.70	Moderate correlation, substantial but small relationship
5	± 0.71 to ± 0.90	High correlation, marked relationship
6	± 0.91 to ± 0.99	Very high correlation, quite dependable relationship
7	± 1	Perfect correlation, almost identical or opposite relationship

The investigator conducted a test with a time gap of 3 weeks on a sample of 70 teachers to find out the web-based learning accessed by teachers of professional and general degree colleges in Mizoram. The detailed information on the reliability coefficient is presented in Table. 3.

Table 3.9
Reliability Indices for Web-based Learning Accessed by Teachers of
Professional and General Degree Colleges

Reliabilities			
N = 70	Mean	SD	Correlation coefficient
Test	39.37	4.06	0.73
Re-test (after three weeks)	41.44	4.08	

Pearson's Product Moment Correlation administered the coefficient of reliability of the scale of Web-based Learning Accessed by Teachers of Professional and General Degree Colleges. The reliability was found to be 0.73, which is a high correlation.

3.6.3 Tool 3: Questionnaire for Investigating Accessibility of Web-based Learning by Students in the Institution:

To determine the accessibility of web-based learning among students of professional colleges and general degree colleges, the researcher developed a questionnaire.

3.6.3.1 Development of Items for Investigating Accessibility of Web-based Learning by Students in the Institution:

The researcher reviewed a wide range of related literature to obtain research items for the questionnaire. Further, the first version of the questionnaire for students included 40 items was developed. However, 10 items were removed from the questionnaire, which resulted in a final draft of 30 items. The final questionnaire broadly categorizes student web-based learning accessibility into: digital device ownership, internet access and usage patterns, online platform and application familiarity, software proficiency, institutional web-based learning experience and pandemic-era online learning experience and satisfaction. Respondents were given

the freedom to answer each statement according to their preference from the options given. (Appendix C)

3.6.3.2 Trying out Scale for Investigating Accessibility of Web-based Learning by Students in the Institution:

The preliminary draft of the questionnaires was administered to 100 students from professional colleges and 100 students from general degree colleges. Instructions were given to the students before distributing the tools at the beginning of the test. The scale was again re-administered to perform item analysis within a time gap of 3 weeks; and the value of each item was determined.

3.6.3.3 Item Analysis for Investigating Accessibility of Web-based Learning by Students in the Institution:

The researcher applied item analysis, a procedure wherein some items are improved, some are cancelled, and some are chosen for testing. The top 27% and bottom 27% of each student's score were set aside for item analysis on the students from professional and general degree colleges. The scores of each student were organized in descending order. Every item's t-test was computed using the upper and lower 27% of the data.

The mean and standard deviation were computed separately for the above-mentioned top and bottom groups. The items with a t-value of more than 2.75, i.e. or significant at the 0.01 level of confidence, were kept for the final scale; items with a t-value of less than 2.05, or significant at the 0.05 level of confidence, were rejected. From 30 items, 5 were items were excluded, and 25 items were included in the primary item. The mean and standard deviation values for the top and bottom groups on each of the 25 items were expressed as 't-value', which is provided in Table. 3.9.

Table 3.10

**Mean, Standard Deviation and t-value of High and Low groups on different
Items of Web-based Learning Accessed by Students of Professional and General
Degree Colleges**

Item No	High Group		Low Group		t-value	Significance level
	Mean	SD	Mean	SD		
1	4.81	0.41	3.85	0.65	9.6	0.01
2	2.60	1.83	3.03	0.92	1.13	NS
3	4.29	0.78	3.74	0.54	3.92	0.01
4	4.48	0.38	3.48	0.59	10	0.01
5	4.70	0.45	3.81	0.74	6.36	0.01
6	4.18	0.61	3.44	0.67	5.29	0.01
7	4.29	0.58	3.59	0.58	5	0.01
8	2.78	0.85	4.00	0.48	6.52	0.01
9	4.29	0.64	3.66	0.66	4.5	0.01
10	3.55	1.71	3.18	1.07	1.23	NS
11	4.81	0.50	3.92	0.88	5.23	0.01
12	2.56	0.88	2.04	1.08	1.62	NS
13	2.70	0.87	4.00	0.39	7.07	0.01
14	3.63	0.56	4.30	0.61	4.17	0.01
15	4.96	0.53	3.70	1.08	6.3	0.01
16	4.55	0.37	3.37	0.86	8.43	0.01
17	4.66	0.31	3.62	0.66	10.4	0.01
18	4.62	0.54	3.37	0.73	8.92	0.01
19	3.62	1.65	3.33	1.22	0.72	NS
20	4.59	0.58	3.40	1.02	5.95	0.01
21	4.88	0.36	3.62	1.07	6.3	0.01
22	4.22	0.81	3.33	0.91	4.04	0.01
23	2.61	0.10	2.09	0.59	1.73	NS
24	4.70	0.54	3.81	0.50	8.9	0.01
25	4.55	0.48	3.62	0.84	6.64	0.01
26	4.81	0.41	3.70	0.77	7.93	0.01
27	4.74	0.70	3.29	1.00	7.25	0.01
28	4.70	0.45	3.48	0.67	12.2	0.01
29	3.41	0.75	4.15	0.82	3.47	0.01
30	2.81	0.92	4.15	0.60	6.30	0.01

NS means Not Significant

3.6.3.4 Reliability for investigating Accessibility of Web-based Learning by Students in the Institution:

The test was conducted with a time gap of 3 weeks on a sample of 200 students. The reliability coefficient was calculated between the two tests using ‘Pearson’s Product Moment Correlation’. The detailed information on reliability coefficient is presented in Table. 3.11

Table 3.11
Reliability Indices for Web-based Learning Accessed by Students of Professional and General Degree Colleges

Reliabilities			
N=200	Mean	SD	Correlation coefficient
Test	41.06	2.95	0.62
Re-test (after three weeks)	41.54	2.85	

The coefficient of reliability of the scale ‘Web-based Learning Accessed by Students of Professional and General Degree Colleges’ came out to be 0.62, which can be considered as ‘moderate’ correlation.

3.6.4 Tool 4: Perception of College Teachers about Web-based Learning:

A rating scale was used to determine the perceptions of teachers of Professional and General Degree Colleges in Mizoram about Web-based Learning. “The rating scale is a device for obtaining judgments of the degree to which an individual possesses certain behavior traits and attributes not readily detectable by objective tests” (Garrett, 2009).

3.6.4.1 Development of Items on Perception of College Teachers about Web-based Learning:

To form statements for assessing the perception of teachers about web-based learning, the researcher examined research design, journals, and literature reviews to determine the different dimensions of web-based learning. After studying these tools, journals, and literature reviews, the investigator came up with 40 statements. The first set of statements about teachers' perceptions of web-based learning was generated. Based on the opinions of the experts, five items were removed. After this, there were 35 statements, representing a positive and negative perception scale, in which the scale required subjects to react to all items on a 3-point scale as 'Always', 'Sometimes' or 'Never' on items 1-10 and 'Agree', 'Undecided' or 'Disagree' on items 11-15. The final questionnaire on perception of web-based learning comprises the following thematic areas – its effectiveness and benefits for students, its advantages for teacher work and efficacy, overall attitude, challenges, feasibility and future role, and training requirements. **(Appendix D)**

3.6.4.2 Trying out Scale on Perception of College Teachers about Web-based Learning:

The try-out scale was given to 70 teachers selected from different colleges in Aizawl City to determine the perception of web-based learning. The scale was explained to the respondents well before administering the test. After giving the test to 70 teachers among professional colleges and general degree colleges, the scale was again re-administered within a time gap of 3 weeks, and item analysis was done by finding out the value of all items.

3.6.4.3 Item analysis on Perception of College Teachers about Web-based Learning:

After administering the test to of 70 teachers, the score on the perception of teachers of professional and general degree colleges about web-based learning was done using the scoring procedure - "Always=3", "Sometimes=2", "Never=1" and

“Agree=3”, “Undecided=2”, “Disagree=1”. Considering an ordered series of scores, the upper 27% and lower 27% were selected for item analysis.

The mean and standard deviation were computed separately for the above-mentioned top and bottom groups. Subsequently, items that were significant at the 0.01 levels of confidence (t-value above 2.75) were retained for the final scale. In contrast, items with a t-value of less than 2.05 or statements significant at a 0.05 confidence level were rejected. Out of 35 statements, 20 were rejected/not significant; the significant item consists of 15. The mean and standard deviation values of the top and bottom groups on each of the 15 statements in the form of “t-value” are given in Table. 3.12.

Table 3.12

Mean, Standard Deviation and t-value of High and Low groups on different Items of Perception of Teachers of Professional and General Degree Colleges about Web-based Learning

Item No	High Group		Low Group		t-value	Significance level
	Mean	SD	Mean	SD		
1	2.89	0.75	3.15	1.03	1.06	NS
2	2.85	0.86	3.81	0.48	5.05	0.01
3	3.11	0.80	4.30	0.54	6.37	0.01
4	2.04	0.59	2.30	0.67	1.51	NS
5	2.33	0.88	2.22	0.58	0.55	NS
6	1.96	0.65	2.85	1.03	3.80	0.01
7	3.37	0.74	4.11	0.42	4.51	0.01
8	4.07	0.62	3.78	0.75	1.59	NS
9	2.37	0.88	2.26	0.71	0.51	NS
10	3.89	0.51	3.67	0.88	1.13	NS
11	3.00	0.83	3.52	0.70	2.48	0.05
12	3.44	0.85	3.85	0.66	1.97	NS
13	2.22	0.93	3.26	0.76	4.47	0.01
14	2.37	0.88	3.37	0.79	4.38	0.01
15	2.22	0.70	2.26	0.90	0.17	NS
16	3.70	0.67	3.85	0.72	0.78	NS
17	3.00	0.78	3.56	0.58	2.96	0.01
18	2.26	0.71	2.52	0.75	1.30	NS
19	2.30	0.87	2.96	0.94	2.71	0.01
20	3.4	0.77	3.30	0.78	0.70	NS
21	3.81	0.74	4.48	0.51	3.87	0.01
22	2.04	0.90	3.04	0.90	4.09	0.01
23	3.74	0.76	4.04	0.71	1.48	NS
24	3.62	0.88	4.04	0.34	2.24	0.05
25	4.22	0.50	4.00	0.39	1.83	NS
26	4.04	0.57	3.70	0.50	0.14	NS
27	3.96	0.59	3.67	0.62	1.80	NS
28	3.93	0.55	4.30	0.54	2.49	0.05
29	3.56	0.70	4.15	0.60	3.34	0.01
30	2.56	0.89	2.85	0.95	1.18	NS
31	2.81	0.92	3.00	0.73	0.82	NS
32	3.93	0.68	3.37	0.93	2.52	0.05
33	3.89	0.80	3.63	0.69	1.28	NS
34	2.19	0.83	2.26	0.66	0.36	NS
35	3.89	0.64	3.48	0.98	1.81	NS

NS means Not Significant

3.6.4.4 Reliability Perception of College Teachers about Web-based Learning:

To establish the reliability scale of ‘Perception of Teachers of Professional and General Degree Colleges about Web-based Learning’, the investigator employed Pearson’s Product-Moment Correlation to calculate the coefficient of reliability between the two tests. Detailed information on the reliability coefficient is presented in Table. 3.13.

Table 3.13
Reliability Indices for Perception of Teachers of Professional and General Degree Colleges about Web-based Learning

Reliabilities			
N=70	Mean	SD	Correlation coefficient
Test	57.51	6.96	0.72
Re-test (after three weeks)	62.35	7.02	

The coefficient of reliability of the scale of ‘Perception of Teachers of Professional and General Degree Colleges about Web-based Learning’ came out to be 0.72, which can be considered a high correlation.

3.6.5 Tool 5: Perception of College Students about Web-based Learning:

To determine the perception of college students of professional and general degree colleges in Mizoram about web-based learning, a rating scale was used for this study. The rating scale is essential, and the raters must have experience or knowledge of those projects, characters, objects, events, or participants. The experience may be direct (actual behavior) or may be indirect or remembered (perceived behavior) (Singh, 2011).

3.6.5.1 Development of Items on Perception of College Students about Web-based Learning:

The researcher generated 45 statements for the study from the first set of statements in the reviewed related literature. Based on the experts' opinions, ten items were deleted, and five were modified and restructured. After that, the drafts consist of 35 items, stating both positive and negative perception statements, in which the scale entails matter to respond to each item on a 3-point scale as 'Always', 'Sometimes' or 'Never' on items 1-10 and 'Agree', 'Undecided' or 'Disagree' on items 11-15. Student perceptions of web-based learning, as measured by this questionnaire, are categorized into: perceived learning benefits and efficacy, general attitude and perceived value, challenges and negative aspects, the future role and potential for online classes to replace traditional ones, and their support and training needs. (Appendix E)

3.6.5.2 Trying out Scale on Perception of College Students about Web-based Learning:

One hundred students from professional colleges and the same number of students from general degree colleges were selected for the tryout test. Instructions were given to the students before the tools were distributed at the beginning of the test. After three weeks gap the scale was re-administered for item analysis.

3.6.5.3 Item Analysis on Perception of College Students about Web-based Learning:

The drafted tool consisted of 35 items and was administered to 200 college students. The scoring was done – “Always=3”, “Sometimes=2”, “Never=1” and “Agree=3”, “Undecided=2”, “Disagree=1”. The scores of these students were arranged in descending order, and the top 27% and the bottom 27% were taken for item analysis.

The top and bottom groups were selected by simultaneously computing the mean and standard deviation. Afterwards, items significant at the 0.01 confidence

level (t-value above 2.75) were accepted for the final scale, while items with a t-value less than 2.04 were removed. 20 of the 35 items were considered insignificant or rejected, and the remaining 15 items were considered for the main item. The mean and standard deviation values of the top and bottom groups on each of the 35 statements in the form of “t-value” are given in Table. 3.14.

Table 3.14

Mean, Standard Deviation and t-value of High and Low groups on different Items of Perception of Students of Professional and General Degree Colleges about Web-based Learning

Item No	High Group		Low Group		t-value	Significance
	Mean	SD	Mean	SD		
1	2.89	0.75	3.15	1.03	1.06	NS
2	2.85	0.86	3.81	0.48	5.05	0.01
3	3.11	0.80	4.30	0.54	6.37	0.01
4	2.04	0.59	2.30	0.67	1.51	NS
5	2.33	0.88	2.22	0.58	0.55	NS
6	1.96	0.65	2.85	1.03	3.80	0.01
7	3.37	0.74	4.11	0.42	4.51	0.01
8	4.07	0.62	3.78	0.75	1.59	NS
9	2.37	0.88	2.26	0.71	0.51	NS
10	3.89	0.51	3.67	0.88	1.13	NS
11	3.00	0.83	3.52	0.70	2.48	0.05
12	3.44	0.85	3.85	0.66	1.97	NS
13	2.22	0.93	3.26	0.76	4.47	0.01
14	2.37	0.88	3.37	0.79	4.38	0.01
15	2.22	0.70	2.26	0.90	0.17	NS
16	3.70	0.67	3.85	0.72	0.78	NS
17	3.00	0.78	3.56	0.58	2.96	0.01
18	2.26	0.71	2.52	0.75	1.30	NS
19	2.30	0.87	2.96	0.94	2.71	0.01
20	3.4	0.77	3.30	0.78	0.70	NS
21	3.81	0.74	4.48	0.51	3.87	0.01
22	2.04	0.90	3.04	0.90	4.09	0.01
23	3.74	0.76	4.04	0.71	1.48	NS
24	3.62	0.88	4.04	0.34	2.24	0.05
25	4.22	0.50	4.00	0.39	1.83	NS
26	4.04	0.57	3.70	0.50	0.14	NS
27	3.96	0.59	3.67	0.62	1.80	NS

28	3.93	0.55	4.30	0.54	2.49	0.05
29	3.56	0.70	4.15	0.60	3.34	0.01
30	2.56	0.89	2.85	0.95	1.18	NS
31	2.81	0.92	3.00	0.73	0.82	NS
32	3.93	0.68	3.37	0.93	2.52	0.05
33	3.89	0.80	3.63	0.69	1.28	NS
34	2.19	0.83	2.26	0.66	0.36	NS
35	3.89	0.64	3.48	0.98	1.81	NS

NS means Not Significant

3.6.5.4 Reliability on Perception of College Students about Web-based Learning:

The investigator employed Pearson's Product-Moment Correlation to calculate the coefficient of reliability of the scale 'Perception of Students of Professional and General Degree Colleges about Web-based Learning'. Detailed information on the reliability coefficient is presented in Table. 3.15

Table 3.15
Reliability Indices for Perception of Students of Professional and General Degree Colleges about Web-based Learning

Reliabilities			
N=200	Mean	SD	Correlation coefficient
Test	39.73	3.08	0.69
Re-test (after three weeks)	44.7	2.97	

The coefficient of reliability of the perception of students of professional and general degree colleges about web-based learning came out to be 0.69, which can be considered a moderate correlation.

3.6.5.5 Scoring on Perception of College Teachers and Students about Web-based Learning:

A Likert scale pattern was followed for the Perception of College Teachers about Web-based Learning and Perception of College Students about Web-based Learning. The scaling technique has a three-point scale position assigned to a scale value. (Sharma, 2010). Each item has three alternative responses- 'always', 'sometimes' and 'never'. All favorable statements are scored from maximum to minimum. For scoring purposes, the positive statements were given the scores 3, 2, 1, and the negative statements were given the scores 1, 2, 3. The highest probable score on the perception scale is (15x3) 45, and the lowest achievable score is (15x1) 15. Since the total number of statements on each scale is 15. Thus, the range of the scale is 15-45. Table 3.16 lists the item numbers for the positive and negative statements.

Table 3.16

Serial Number of Positive and Negative Statements of Perception of Web-based

Types of statements	Item numbers	Total
Positive	1, 2, 3, 4, 5, 6, 7, 9, 11	9
Negative	8, 10, 12, 13, 14, 15	6
TOTAL		15

3.6.5.6 Norms and Interpretation of the Scale on Perception of College Teachers and Students about Web-based Learning:

To develop the norms, Stanine scores were used to analyze test results, categorizing students' perception and use of web-based learning by clarifying their relative positions. Stanine (STANDARD NINE) is a method of scaling test scores on a nine-point standard scale with a mean of five and a standard deviation of two (Lal & Joshi, 2009). As it is shown in Table 3.15, the obtained score of 35 and above belongs to the Stanine score of 9, which is labeled as very highly positive; 8 & 7 are

labeled as highly positive; 6, 5 & 4 are labeled as moderately positive; 3 & 2 is labeled as low positive and 1 as very low positive.

Table 3.17
Interpretation of Perception of Web-based Learning

Sl. No.	Stanine Score	Interpretation	Range of Norms
1	9	Very Highly Positive	35 & above
2	8, 7	Highly Positive	33-34
3	6, 5, 4	Moderately Positive	29-32
4	3, 2	Low Positive	27-28
5	1	Very Low Positive	26 & below

3.6.6 Tool 6: Uses of Web-Based Learning by College Teachers in the Institution:

The researcher also constructed a rating scale to determine the uses of web-based learning by teachers of professional and general-degree colleges in Mizoram.

3.6.6.1 Development of Items on Uses of Web-Based Learning by College Teachers in the Institution:

After consulting relevant and available literature, the investigator framed 36 statements. Based on experts' feedback, four statements were deleted from the initial draft of the scale, and some statements were changed and amended. The tool consists of 32 items, and the respondents had to respond to each item on a 3-point scale based on the given options, such as 'Always', 'Sometimes', or 'Never'. The final items for investigating the usage of web-based learning by college teachers consisted of instructional integration and resource utilization, communication and administrative use, digital workflow and material transfer, and comfort, and personal impact. **(Appendix F)**

3.6.6.2 Try-out Scale on Uses of Web-Based Learning by College Teachers in the Institution:

Again, the try-out test was administered to 70 college teachers selected from different colleges in Aizawl City to determine the uses of web-based learning. The scale was explained to the respondents well before the test was administered.

3.6.6.3 Item Analysis on Uses of Web-Based Learning by College Teachers in the Institution:

After administering the test to 70 teachers, the score on the uses of web-based learning among teachers of professional and general degree colleges was calculated as “Always = 3,” “Sometimes =2,” and “Never = 1.”The scores were then set in descending order, and the upper 27% and lower 27% were set aside for item analysis.

The mean and standard deviation were computed separately for the above-mentioned top and bottom groups. After this, items with a t-value above 2.75, i.e., statements that are significant at a 0.01 level of confidence were saved for the final scale, and statements with a t-value less than 2.04 were rejected. Out of 32 statements, 17 were rejected/not significant, and the considerable item consists of 15 statements. The mean and standard deviation values of the top and bottom groups on each of the 32 statements in the form of ‘t-value’ are given in Table. 3.18

Table 3.18

**Mean, Standard Deviation and t-value of High and Low groups on different
Items of Uses of Web-based Learning among the Teachers of Professional and
General Degree Colleges**

Item No	High Group		Low Group		t-value	Significance level
	Mean	SD	Mean	SD		
1	19.3	0.73	2.56	1.19	2.35	0.05
2	2.63	0.79	3.78	0.64	5.86	0.01
3	2.56	0.46	2.27	1.22	0.97	NS
4	2.72	0.64	2.46	0.56	1.85	NS
5	2.34	0.90	2.04	0.70	1.5	NS
6	1.81	0.68	2.85	1.06	4.27	0.01
7	3.15	0.91	4.04	0.44	4.59	0.01
8	3.19	0.88	3.56	0.75	1.66	NS
9	2.52	0.85	3.56	0.64	5.07	0.01
10	2.48	0.80	3.19	0.88	3.07	0.01
11	3.4	0.77	3.30	0.78	0.70	NS
12	3.56	0.80	3.93	0.68	1.84	NS
13	2.63	0.97	3.15	0.82	2.13	0.05
14	3.00	0.78	3.81	0.62	4.23	0.01
15	2.78	0.85	4.00	0.48	6.52	0.01
16	2.6	1.43	2.97	0.94	1.23	NS
17	3.22	0.80	3.96	0.59	3.88	0.01
18	2.56	1.09	3.44	0.85	3.35	0.01
19	2.22	0.70	2.26	0.90	0.17	NS
20	3.70	0.67	3.85	0.72	0.78	NS
21	3.89	0.51	3.67	0.88	1.13	NS
22	3.00	0.83	3.52	0.70	2.48	0.05
23	3.44	0.85	3.85	0.66	1.97	NS
24	2.45	1.95	3.15	1.04	1.66	NS
25	3.40	0.80	4.33	0.63	5.47	0.01
26	2.93	1.41	2.37	1.09	1.70	NS
27	4.81	0.41	3.85	0.65	9.6	0.01
28	2.60	1.83	3.03	0.92	1.13	NS
29	2.56	0.46	2.38	0.80	0.90	NS
30	2.61	0.10	2.09	0.59	1.73	NS
31	4.70	0.54	3.81	0.50	8.9	0.01
32	2.22	0.70	2.26	0.90	0.17	NS

NS means Not Significant

3.6.6.4 Reliability on Uses of Web-Based Learning by College Teachers in the Institution:

The coefficient of reliability of the scale uses of web-based learning among teachers of professional and general degree colleges was tested using Pearson's Product-Moment Correlation. Detailed information on the reliability coefficient is presented in Table. 3.19

Table 3.19
Reliability Indices for Uses of Web-based Learning among Teachers of Professional and General Degree Colleges

Reliabilities			
N=70	Mean	SD	Correlation coefficient
Test	46.7	6.6	0.67
Re-test (after three weeks)	44.2	4.4	

The coefficient of reliability of uses of web-based learning among teachers of professional and general degree colleges was 0.67, which can be considered a moderate correlation.

3.6.7 Tool 7: Uses of Web-Based Learning by College Students in the Institution:

The researcher developed a rating scale to determine the uses of web-based learning among the students of professional and general-degree colleges in Mizoram.

3.6.7.1 Development of Items on Uses of Web-Based Learning by College Students in the Institution

The investigator, after consulting relevant and available literature, framed 42 statements. Based on the feedback of experts, nine statements were deleted from the initial draft. The tool consists of 33 items, and the respondents had to give a response

to each item on a 3-point scale based on the given options, such as ‘Always’, ‘Sometimes’, or ‘Never’. The final questionnaire on the usage of web-based learning by college students primarily covered content access and self-directed learning, engagement with digital tools, digital workflow and material exchange, personal comfort and motivation, and perceived psychological impact. **(Appendix 7)**

3.6.7.2 Try out Scale on Uses of Web-Based Learning by College Students in the Institution

The draft scale was administered to 100 professional college students and 100 general degree college students. Instructions were given to the students before distributing the tools at the beginning of the test. After administering the test to 200 students each from professional colleges and general degree colleges, the scale was again re-administered within a time gap of 3 weeks, and the process of item analysis involved determining each item’s value.

3.6.7.3 Item Analysis on Uses of Web-Based Learning by College Students in the Institution:

The score on the uses of web-based learning among students of professional and general degree colleges was done using a 3-point scale –“Always=3”, “Sometimes=2”, and “Never=1” after administering the test to 200 students. The scores were then placed in descending order, and the higher 27% and lower 27% were left behind for item analysis.

The mean and standard deviation were computed separately for the above-mentioned top and bottom groups. After this, those items with a t-value above 2.75, i.e., statements significant at a 0.01 level of confidence were retained for the final scale, and statements with a t-value less than 2.04 were rejected. Out of 33 statements, 18 statements were rejected/not significant, and the significant item consists of 15 statements. The mean and standard deviation values of the top and bottom groups on each of the 35 statements in the form of ‘t-value’ are specified in Table. 3.20.

Table 3.20

**Mean, Standard Deviation and t-value of High and Low groups on different
Items of Uses of Web-based Learning among the Students of Professional and
General Degree Colleges**

Item No	High Group		Low Group		t-value	Significance level
	Mean	SD	Mean	SD		
1	19.3	0.73	2.56	1.19	2.35	0.05
2	2.63	0.79	3.78	0.64	5.86	0.01
3	2.56	0.46	2.27	1.22	0.97	NS
4	2.72	0.64	2.46	0.56	1.85	NS
5	2.34	0.90	2.04	0.70	1.5	NS
6	1.81	0.68	2.85	1.06	4.27	0.01
7	3.15	0.91	4.04	0.44	4.59	0.01
8	3.19	0.88	3.56	0.75	1.66	NS
9	2.52	0.85	3.56	0.64	5.07	0.01
10	2.48	0.80	3.19	0.88	3.07	0.01
11	3.4	0.77	3.30	0.78	0.70	NS
12	3.56	0.80	3.93	0.68	1.84	NS
13	2.63	0.97	3.15	0.82	2.13	0.05
14	3.00	0.78	3.81	0.62	4.23	0.01
15	2.78	0.85	4.00	0.48	6.52	0.01
16	2.6	1.43	2.97	0.94	1.23	NS
17	3.22	0.80	3.96	0.59	3.88	0.01
18	2.56	1.09	3.44	0.85	3.35	0.01
19	2.22	0.70	2.26	0.90	0.17	NS
20	3.70	0.67	3.85	0.72	0.78	NS
21	3.89	0.51	3.67	0.88	1.13	NS
22	3.00	0.83	3.52	0.70	2.48	0.05
23	3.44	0.85	3.85	0.66	1.97	NS

24	2.45	1.95	3.15	1.04	1.66	NS
25	3.40	0.80	4.33	0.63	5.47	0.01
26	2.93	1.41	2.37	1.09	1.70	NS
27	4.81	0.41	3.85	0.65	9.6	0.01
28	2.60	1.83	3.03	0.92	1.13	NS
29	2.56	0.46	2.38	0.80	0.90	NS
30	2.61	0.10	2.09	0.59	1.73	NS
31	4.70	0.54	3.81	0.50	8.9	0.01
32	2.22	0.70	2.26	0.90	0.17	NS
33	3.70	0.67	3.85	0.72	0.78	NS

NS means Not Significant

3.6.7.4 Reliability on Uses of Web-Based Learning by College Students in the Institution:

The coefficient of reliability of the scale uses of web-based learning among students of professional and general degree colleges was conducted using Pearson's Product-Moment Correlation. Detailed information on the reliability coefficient is presented in Table. 3.21

Table 3.21
Reliability Indices for Uses of Web-based Learning among Students of Professional and General Degree Colleges

Reliabilities			
N=200	Mean	SD	Correlation coefficient
Test	50.55	3.49	0.69
Re-test (after 3 weeks)	52.76	3.82	

The coefficient of reliability of uses of web-based learning among students of professional and general degree colleges was 0.69, which can be considered a moderate correlation.

3.6.7.5 Scoring on Uses of Web-Based Learning by College Teachers and Students in the Institution:

A Likert scale pattern was employed for the scale in the study, focusing on the use of web-based learning by college teachers and students within the institution. Each item offers three alternative responses: 'always', 'sometimes', and 'never'. All favorable statements are scored from maximum to minimum. For scoring purposes, the positive statements receive scores of 3, 2, and 1, while the negative statements are assigned scores of 1, 2, and 3. The highest possible score on the perception scale is (15x3) 45, and the lowest possible score is (15x1) 15, as the total number of statements in each scale is 15. Therefore, the range of the scale is 15-45. The item numbers for positive and negative statements are presented in Table 3.22.

Table 3.22

Serial Number of Positive and Negative Statements of Uses of Web-based

Types of statements	Item numbers	Total
Positive	1, 2, 4, 5, 6, 7, 9, 10, 15	9
Negative	3, 8, 11, 12, 13, 14	6
TOTAL		15

3.7 Procedure of Data Collection

After the random selection of the colleges, the researcher visited the computer centre or ICT centre to get information about the availability of web-based learning resources with the help of a checklist cum observation schedule.

Henceforth, to collect data from teachers and students, proper and precise instruction was given before administering the questionnaires and rating scales. They

were informed about the confidentiality of their profile and questionnaire responses. The rationale of the research was explained to them with complete understanding, and not to hesitate to answer the questions. After providing all the necessary instructions, a questionnaire was distributed, and the respondents started giving responses.

3.7 Statistical Techniques for Analysis

The study was descriptive in nature; SPSS and MS Excel were used to analyze the data. The investigator employed statistical techniques percentage, the Mann-Whitney U test (a non-parametric statistic for comparing two populations based on independent random samples from each) (Singh, 2011), and the Kruskal-Wallis Test (a test which is used for testing the null hypothesis that 'k' independent random samples come from identical universe against the alternative hypothesis that the medians of these universes are not equal) (Kothari & Garg, 2020).

In addition to presenting outlier cases, the overall pattern formed was detailed and interpreted side by side. The researcher triangulated the data using various techniques, including questionnaire items, observations, and an interview schedule.

CHAPTER – IV

ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter focuses on the analysis and interpretation of data collected through instruments developed by the researcher. Specifically, these instruments were designed for both teachers and students to assess the web-based resources available to them and those they actively used. To investigate the perceptions and objectives of web-based learning among teachers and students in vocational and general degree colleges, the researcher utilized a rating scale consisting of 15 statements for each dimension of study. Additionally, semi-structured interviews were conducted with faculty members responsible for information and communication technology, computer laboratories, and other non-teaching staff, as well as anyone available during the data collection process. The data was gathered from 5 vocational colleges and 12 general degree colleges, as detailed below:

The professional colleges:

- (i) College of Veterinary Science & Animal Husbandry (VSAH)
- (ii) National Institute of Electronics and Information Technology (NIELIT)
- (iii) Institute of Advanced Study in Education (IASE)
- (iv) Regional Institute of Paramedical and Nursing Sciences (RIPANS)
- (v) Government Mizoram Law College (GMLC)

The general degree colleges:

- (i) Government Saiha College
- (ii) Government Lawngtlai College
- (iii) Government J. Buana College
- (iv) Lunglei Government College
- (v) Government Kolasib College
- (vi) Government Aizawl College
- (vii) Government Hrangbana College

- (viii) Government T. Romana College
- (ix) Government Champhai College
- (x) Government Serchhip College
- (xi) Pachhunga University College
- (xii) Government Zirtiri Residential Science College

This chapter is divided into five sections, corresponding to the objectives of the study mentioned below:

4.2 Objective No. 1: To find out the web-based learning resources being provided to the teachers and students of professional and general degree colleges in Mizoram.

In order to find out the web-based learning resources being provided to the teachers and students of professional colleges and general degree colleges in Mizoram, the researcher personally visited all the institutions. ‘Checklist-cum-Observation Schedule for the Available Resources related to Web-based Learning in the Institution’ was used to collect data for this objective (Objective No.1). The collected information related to web-based learning resources from various colleges is presented sequentially.

4.2.1 Web-based Learning Resources available in Professional Colleges in Mizoram

COLLEGE OF VETERINARY SCIENCE & ANIMAL HUSBANDRY (VSAH)

VSAH was established under the Central Agriculture University on February 20, 1995. The first batch of the college started in 1997. The College was located in Selesih, North Aizawl. There were a total of 53 teaching faculty members in the college. All the departments, sections, offices, hostels, guest houses, and college residences were provided with 2 Mbps of broadband internet and Voice Over Internet Protocol (VoIP) Connectivity. Table 4.1 shows that the VSAH had a computer laboratory with 20 sets of computers. The college was equipped with internet connectivity, such as VSAT. The photocopier machine was accessible, and no other resources were reported as available during data collection.

NATIONAL INSTITUTE OF ELECTRONICS AND INFORMATION TECHNOLOGY (NIELIT)

NIELIT, previously known as DOEACC, was founded in 2001 at Industrial Estate, Zuangtui, Aizawl. There were 37 teachers on the main campus of the college. The centre had opened more than 12 study centres covering five different districts in different parts of the state. There were more than 200 computers, 20 classrooms designed as smart classrooms, the institutions had 2 video conferencing rooms and resources such as printers (2) and photocopier machines (3) were accessible. The institution had internet and intranet connectivity, and VSAT, NKN, Radio Link, BSNL, and NextCom were available. All classrooms were ergonomically furnished, and projectors were installed. NIELIT had subscribed to the Online IEEE Xplore Digital Library.

INSTITUTE OF ADVANCED STUDY IN EDUCATION (IASSE)

IASSE was established in 1975 in Republic Veng, Aizawl. IASE was one of the teacher training colleges in Mizoram. There were 17 teachers and 502 students in the 2022-2023 sessions. At the time of data collection, it was found that TEACHER ISAE had a computer centre with 20 sets of computers. Ten projectors were installed for educational purposes. An INFLIBNET service and web-based language teaching platform like SONAKO were also available in the institution. Google Classroom and Zoom were the most used apps for academic interaction during the COVID-19 pandemic.

GOVERNMENT MIZORAM LAW COLLEGE (GMLC)

GMLC was established in 1983. It was situated in Luangmual, the western part of Aizawl City. GMLC was the only Law College in the state. There were 13 teachers and 189 students in the 2022-2023 sessions. GMLC had a computer room with 20 computers and a language laboratory with ten sets of computers. Internet connection was available, and each classroom had wall-mounted projectors.

REGIONAL INSTITUTE OF PARAMEDICAL AND NURSING SCIENCES
(RIPANS)

RIPANS was established in 1995. The Central Library of RIPANS was established in 1997 and specializes in medical Science. There were 60 teaching faculty and 219 students in session 2022-23. RIPANS had an e-resources centre and 20 sets of computers. A Web-OPAC interface was available, library software like SOKA was accessible, and Radio Frequency Identification (RFID) was also provided in the library.

Table 4.1

Web-based Learning Resources available in Professional Colleges in Mizoram

Name of the College		VSAH	NIELIT	IASE	GMLC	RIPANS
Sl. No.	Statements / Items	Responses				
1	Computer Lab.	Yes	Yes	Yes	Yes	Yes (e-resource centre)
2	Nos. of computer	20	200+	20	20	20
3	Institutional network	Internet Connectivity	Internet and Intranet Connectivity	Internet Connectivity	Internet Connectivity	Internet Connectivity
4	Smart Classroom	-	20	-	-	-
5	Internet Connection	VSAT	VSAT, NKN, Radio Link, BSNL, NextCom	-	-	-
6	E-resources	-	Online IEEE Xplore Digital Library	INFLIBNET	-	-
7	Photocopier machine	Yes	3	-	-	-
8	Video conferencing room	-	2	-	-	-
9	Printer	-	15	-	-	-
10	Scanner	-	15	-	-	-
11	Projector	-	All classrooms	10	5 (all classrooms)	-

12	Ergonomic furnishing	-	All classrooms	-	-	-
13	Specific software	-	-	SONAKO Connect	-	KOHA, Radio Frequency Identification (RFID)
14	Online mode used during the COVID-19 pandemic	Google Classroom, Zoom, Google Meet	Zoom, Google Meet	Google Classroom, Zoom	Google Classroom, WebEx, Zoom, Google Meet	Zoom, Google Meet
15	Language Lab.	No	No	No	Yes (20 computers)	No

Web-based learning resources provided to the teachers and students of professional colleges were uneven, as the institutes differed. As per the norms, all the professional colleges, VSAH, NIELIT, IASE, GMLC, and RIPANS in Mizoram had a computer centre or e-resource centre, computers, and an institutional network.

NIELIT, an institute of technology, had well-equipped classrooms, a laboratory, and a campus with web-based resources. It provided access to various technological tools, including projectors, printers, scanners, photocopiers, e-resources, internet connectivity, smart classrooms, and ergonomic furniture. At the same time, VSAH had e-resources and projectors, and GMLC also had projectors in all its classrooms.

Professional colleges in Mizoram were well equipped with specific software, and other technical supports were prepared based on the needs of the institutions such as SONAKO Connect, a web-based platform for teaching languages, passive language sessions may become interactive speaking environments, was available at IASE, and KOHA, an integrated library system (ILS) that was open-source and utilized by public, educational and special libraries worldwide, and RFID– a technique that passively identifies tagged objects using radio waves were available in RIPANS.

During the COVID-19 pandemic, all the professional colleges practised online classes using software applications like Google Classroom, Google Meet,

WebEx, Zoom, and any other applicable and suitable software applications. A language laboratory was a room with audio and visual devices to help students learn languages. Only the GMLC had a language laboratory among the professional colleges.

The blank column in Table 4.1 indicated that no information was given in response to a particular item or query, which showed that the resources were unavailable in the institution. It also showed that the majority of the professional colleges lacked adequate web-based resources. So, it could be said that each institute needed to provide more web-based services.

4.2.2 Web-based Learning Resources available in General Degree Colleges in Mizoram

GOVERNMENT SAIHA COLLEGE

Government Saiha College was established in 1978 in response to public demand, which was later recognized by the Government of Mizoram in 1979. It was located in the southern part of Mizoram and was the only college in the Saiha district, located in College Vaih-II. The college offered an arts stream. There were 23 teachers and 585 students in the 2022-2023 sessions. Government Saiha College had internet connectivity for faculty; smart classrooms were under construction during the time of data collection, which was under the RUSA project. Computer centres and language laboratories were available, with ten sets of computers each and ten laptops available for faculty. During the COVID-19 pandemic, Google Meet and Zoom were the most common platforms used for academic interaction, and e-resources were under processed for accessibility. One (1) projector was installed in the college seminar hall.

GOVERNMENT LAWNGTLAI COLLEGE

Government Lawngtlai College was established in 1980 and was located in College Veng, Lawngtlai. It was situated in the southern part of Mizoram. The college offered an arts stream. There were 39 teachers and 389 students in year 2022–2023. Unfortunately, the computer laboratory was burned, and various steps were taken to

renovate the building. A memorandum of understanding (MoU) was signed by the Jio Company and the college to link the internet as soon as a Jio signal tower was installed, enabling all staff members and students to access the internet for free. A computer center-cum-e-resource centre was available with 15 sets of computers. Other resources like projectors (8), television (1), digital cameras (2), printers (5), photocopier machine (1), and a scanner (1) were available in the institution. Google Meet, Zoom, Google Classroom, and WhatsApp were used for academic purposes during the COVID-19 pandemic.

GOVERNMENT J. BUANA COLLEGE

Government J. Buana College was one of the colleges in Lunglei District. It was established in 1983 and was provincialized by the Government of Mizoram in October 2007. The college offered arts and commerce streams. There were 40 teachers and 583 students in 2022-2023. A computer centre was available with 20 sets of computers. Each classroom was Wi-Fi connected. The institution had two smart classrooms and six projectors; the seminar hall was equipped as a digital classroom, and the N-list was accessible. Google Meet, Google Forms, and WebEx were the most popular apps used for academic purposes during the COVID-19 pandemic.

LUNGLEI GOVERNMENT COLLEGE

Lunglei Government College was established on 10th September 1964 and became provincialized in 1976. It was one of the colleges in Lunglei District in the southern part of Mizoram. The college offered science and arts streams. There were 67 teachers and 1251 students in the 2022-2023 sessions. The college had a computer room with 15 sets of computers. Internet connectivity was available, and the N-list was accessible. E-resources such as projectors (13), televisions (2), digital cameras (1), printers or scanners (3), and photocopier machines (2) were available in the institutions. During the COVID-19 pandemic, various software applications like Zoom, Google Meet, Google Classroom, and WebEx were used for academic purposes.

GOVERNMENT KOLASIB COLLEGE

Government Kolasib College was established by local leaders on October 10, 1977. On 13th January 1978, a Governing Body was formally established on 19th July 1978. The college was provincialized under the State Government on 31st January 1992 and then came to be known as Government Kolasib College. It was the only college in Kolasib district in the western part of Mizoram. The college offered Science, Arts and COMPUTER SCIENCES. There were 56 teachers and 738 students in the 2022-2023 sessions. Government Kolasib College had a computer centre with 50 sets of computers. Internet connectivity was available, and INFLIBNET and N-List were accessible. There were three projectors in the institution. Specific software such as SONAKO, ORACLE 10G, 8085 Simulator, VISUAL BASIC 2010, Ubuntu and Turbo C were provided to the teachers and students of Government Kolasib College.

GOVERNMENT CHAMPHAI COLLEGE

Government Champhai College was established in 1973 and was affiliated with Guwahati University. The college is the only college in Champhai District, which is in the eastern part of Mizoram. It offered streams like arts, science, commerce and computer science. There were 63 teachers and 836 students in the 2022-2023 sessions. The Internet resource centre was set up in Government Champhai College, having 15 sets of computers. The college had a computer science laboratory with 30 sets of computers and a geography laboratory with 10 computers. Each core classroom (10) was well furnished as a smart classroom. Internet connectivity was available and INFLIBNET and N-List were accessible. Specific software such as Oracle, VB, Turbo C, C++, Tally, Emulator, and Ubuntu were provided to the teachers and students. Application software like Google Meet and Google Classroom were used for educational purposes during the COVID-19 pandemic.

GOVERNMENT SERCHHIP COLLEGE

Government Serchhip College was established on 25th August 1973. It was located in New Serchhip town and was the only college within the Serchhip district in the central part of Mizoram. The college offered arts, science and computer science.

There were 52 teachers and 502 students in the 2022-2023 sessions. The Internet resource centre was available, having 45 sets of computers; there were ten laptops and 11 projectors, and the college also had six smart classrooms. Internet connectivity was available where INFLIBNET and N-List were accessible. Academic platforms like the National MOOC platform, SWAYAM, and NPTEL were provided in the institution. Google Classroom, Google Meet, Zoom, YouTube, and WhatsApp were the most used application software during the COVID-19 pandemic. Specific software such as SUSE, Kubuntu, Ubuntu, Linux, Oracle Studio, and SONAKO were used by the teachers and students of Government Serchhip College.

GOVERNMENT T. ROMANA COLLEGE

Government T. Romana College was established on 3rd June 1992, located in Republic Veng, Aizawl. The college introduced the Arts subject. There were 48 teachers and 1487 students in the 2022–2023 sessions. The college had a computer centre with 18 sets of computers and a language laboratory with 20 computers. Each department in the college had laptops (8). There were ten projectors, one television, six printers, two photocopier machines and two scanners. Internet connectivity was available, in which INFLIBNET and N-List were accessible. Google Meet and WebEx were the most popular application software used during the COVID-19 pandemic.

GOVERNMENT AIZAWL COLLEGE

Government Aizawl College was established on 13th January 1975 in Sikulpuikawn, Aizawl. The college had commerce and arts streams in the undergraduate section and an Education department in the postgraduate section. There were 55 teachers and 2166 students in the 2022–2023 sessions. The internet resource centre and language laboratory had 20 computers in each centre. There were nine laptops provided for each department, seven printers, and 20 projectors. Internet connectivity was available in which INFLIBNET, N-List, and the National Digital Library of India were accessible. Specific software, Tally, were used by the commerce department.

GOVERNMENT HRANGBANA COLLEGE

Government Hrangbana College was established in July 1980, located in Chanmari, Aizawl. The college offered arts and commerce at the undergraduate and postgraduate levels. There were 60 teachers and 2246 students in the 2022-2023 sessions. The internet resource centre was set up with 30 sets of computers, and a language laboratory had 20 sets of computers; SONAKO learning software was used in the language laboratory. Each classroom had projectors (20). Internet connectivity was available in the college and INFLIBNET, N-List, and the National Digital Library of India were accessible. Various software applications, such as Google Classroom, Google Meet, and Zoom, were used during the COVID-19 pandemic for educational purposes.

PACHHUNGA UNIVERSITY COLLEGE

Pachhunga University College was established in 1958, located in College Veng, Aizawl. It was the only constituent college that offered arts, science, commerce, management, and post-graduate courses (philosophy, Mizo, Geophysics, and life science). Pachhunga University College had a computer centre and a language laboratory with 30 sets of computers in each. Internet connectivity was available in the colleges N-List and Internet Cell of the Library were utilized by the teachers and students of the college. Specific software like Tally was used. There were 38 projectors in the institution. Google Classroom and Zoom were utilized during the COVID-19 pandemic.

GOVERNMENT ZIRTIRI RESIDENTIAL SCIENCE COLLEGE

Government Zirtiri Residential Science College was established in 1980. The college was located in Ramthar Veng, Aizawl. It was the only college in the state that offered Science. There were 67 teachers and 971 students in the 2022-2023 sessions. The institution had a computer centre-cum-language laboratory with 20 sets of computers. Other than that, 88 computers and 19 projectors were available for academic purposes. Internet connectivity was available, and INFLIBNET and N-List were also accessible. SANAKO software was provided in the language laboratory.

Table 4.2
Web-based Learning Resources available in General Degree Colleges in
Mizoram (Item 1 – 5)

<i>Name of the College</i>	<i>1. Computer Lab.</i>	<i>2. Nos. of computer</i>	<i>3. Institutional network</i>	<i>4. Smart Classroom</i>	<i>5. E-resources</i>
Govt. Saiha College	Yes	10	Internet Connectivity (Faculty)	Under Construction (RUSA)	under process
Govt. Lawngtlai College	Yes	15	Under Process	-	-
Govt. J. Buana College	Yes	20	Internet Connectivity (wifi connection in each classroom)	2 + 1 Digital Classroom	N-List
Lunglei Govt. College	Yes	15	Internet Connectivity	-	N-List
Govt. Kolasib College	Yes	50	Internet Connectivity	-	N-List, INFLIBNET
Govt. Champhai College	Yes	55 - 15 (IRC), 30 (Comp Sc. Lab.), 10 (Geog. Lab)	Internet Connectivity	10 (each Core Classroom)	N-List, INFLIBNET
Govt. Serchhip College	Yes (IRC)	45	Internet Connectivity	6	N-List, INFLIBNET
Govt. T. Romana College	Yes	18	Internet Connectivity	-	N-List, INFLIBNET
Govt. Aizawl College	Yes (IRC)	20	Internet Connectivity	-	N-List, INFLIBNET National Digital Library of India
Govt. Hrangbana College	Yes (IRC)	30	Internet Connectivity	-	N-List, INFLIBNET National Digital Library of India
Pachhunga University College	Yes	30	Internet Connectivity	-	N-List, Internet Cell of Library
Govt Zirtiri Res. Sc. College	Yes	88	Internet Connectivity	-	N-List, INFLIBNET

Table 4.3

**Web-based Learning Resources available in General Degree Colleges in
Mizoram (Item 6 – 10)**

<i>Name of the College</i>	<i>6. Photocopier machine</i>	<i>7. Printer</i>	<i>8. Scanner</i>	<i>9. Projector</i>	<i>10. Specific software</i>
Govt. Saiha College	-	-	-	1 (Seminar Hall)	-
Govt. Lawngtlai College	1	5	1	-	-
Govt. J. Buana College	-	-	-	6	-
Lunglei Govt. College	2	3	3	13	-
Govt. Kolasib College	-	-	-	3	SANAKO Connect, ORACLE 10G, 8085 Simulator, VISUAL BASIC 2010, Ubuntu, Turbo C
Govt. Champhai College	-	-	-	-	ORACLE, VISUAL BASIC, Turbo C, C++, Tally, Emulator, Ubuntu
Govt. Serchhip College	-	-	-	11	SUSE, Kubuntu, Ubuntu, Linux, Oracle Studio, SONAKO
Govt. T. Romana College	2	6	2	10	-
Govt. Aizawl College	5	7	7	20	Tally
Govt. Hrangbana College	-	-	-	20 - every classroom	SANAKO Connect
Pachhunga University College	-	-	-	38	Tally
Govt Zirtiri Res. Sc. College	-	-	-	19 - every classroom	SANAKO Connect

Table 4.4

**Web-based Learning Resources available in General Degree Colleges in
Mizoram (Item 11 – 15)**

<i>Name of the College</i>	<i>11. Online mode used during COVID 19 pandemic</i>	<i>12. Language Lab.</i>	<i>13. Nos. of computer</i>	<i>14. Nos. of Laptop</i>	<i>15. Academic platform</i>
Govt. Saiha College	Google Meet, Zoom	Yes	10	10	-
Govt. Lawngtlai College	Google Meet, Zoom, Google Classroom, WhatsApp	No	-	-	-
Govt. J. Buana College	Google Meet, Google Forms, WebEx	No	-	-	-
Lunglei Govt. College	Zoom, Google Meet, Google Classroom, WebEx	No	-	-	-
Govt. Kolasib College	Google Classroom, Zoom, Google Meet	No	-	-	-
Govt. Champhai College	Google Meet, Google Classroom	No	-	-	-
Govt. Serchhip College	Google Classroom, Google Meet, Zoom, YouTube, WhatsApp	No	-	10	MOOC, SWAYAM, NPTEL
Govt. T. Romana College	Google Meet, WebEx	Yes	20	8 (Each Dept.)	-
Govt. Aizawl College	Google Classroom - Meet - Forms, Whatsapp	Yes	20	-	-
Govt. Hrangbana College	Google Classroom, Google Meet, Zoom	Yes	20	-	-
Pachhunga University College	Google Classroom, Zoom	Yes	30	-	-
Govt Zirtiri Res. Sc. College	Google Classroom, Google Meet, Zoom, WebEx	Yes	20	-	-

Web-based learning resources provided to teachers and students in general degree colleges were often adequate. The table showed that essential resources like smart classrooms, photocopier machines, printers, projectors, language laboratories, and internet connectivity for students were unavailable in some institutions, varying significantly from one college to another. However, as per the norms, all the institutions (Government Saiha College, Government Lawngtlai College, Government J. Buana College, Lunglei Government College, Government Kolasib College, Government Champhai College, Government Serchhip College, Government T. Romana College, Government Aizawl College, Government Hrangbana College, Pachhunga University College and Government Zirtiri Residential Science College) had a computer centre or internet resource centre, and connected with internet facilities, except that due to a terrible event, Government Lawngtlai College was in the process of setting up an internet connection.

Internet connectivity was essential for teaching and learning process. However, at institutions other than Government J. Buana College, internet access was limited to computer centres or administrative offices of the institution. Only in the Government J. Buana College were all the classrooms well equipped with internet services. As internet facilities had replaced the traditional classroom setup, teachers had been enthusiastically using devices such as smart boards, tablets, etc. to impart education, making the learning environment dynamic and collaborative.

It came to light that Government Saiha College was blending traditional teaching and learning methods with smart classroom technology. Meanwhile, each core classroom in Government Champhai College had already equipped as a smart classroom, and Government J. Buana College featured two smart classrooms and one digital classroom. Since smart classrooms enabled teachers and students to engage with global education through webinars, live or online lectures, and other means, it was deemed necessary to implement them in various colleges to stay updated with the latest advancements. Furthermore, it was found that each college subscribed to UGC N-List and connected to the OPAC system and SOUL 2.0 software. The majority of the colleges also had linkages to the National Digital Library and INFLIBNET.

ICT significantly simplified digital learning and enhanced the teaching and learning process, providing to be a versatile tool for education. However, Table 4.3 showed that most general degree colleges in Mizoram lacked essential ICT facilities like printers, scanners, photocopier machines, and video conferencing rooms. Projectors, on the other hand, were widely. This implied the need to equip each institution with smart classroom to enable students to access knowledge directly in their respective classrooms. The majority of the general degree colleges in Mizoram utilized specific software relevant to their subjects, including SANAKO Connect, ORACLE 10G, 8085 Simulator, KOHA, SUSE, Linux, Oracle, VISUAL BASIC 2010, Ubuntu, Turbo C, and Tally.

During the COVID-19 pandemic, all general degree colleges practised online classes using software applications like Google Classroom, Google Meet, WebEx, Zoom, and other applicable and suitable software applications. Notably, academic platforms like the National MOOC platform, SWAYAM, and NPTEL were introduced exclusively Government Serchhip College.

The information gathered indicated that the requirements for web-based learning resources varied across institutions due to their diverse disciplines, locale and populations.

4.3 Objective No. 2: To find out the web-based learning resources being accessed by the teachers and students of professional and general degree colleges in Mizoram.

This section dealt with the second objective of the study regarding the web-based learning resources accessed by the teachers and students of professional and general degree colleges in Mizoram. To achieve this objective, the investigator used a self-made tool, ‘Questionnaire for Teachers to Investigate the Accessibility of Web-based Learning’ and ‘Questionnaire for Students to Investigate the Accessibility of Web-based Learning’, for teachers and students, respectively.

4.3.1 Web-based Learning Resources being accessed by the Teachers of Professional and General Degree Colleges in Mizoram

Table 4.5

Web-based Learning Resources being accessed by the Teachers of Professional and General Degree Colleges in Mizoram (Item 1 – 5)

Items / Statements	Label	Responses		
		Professional 25	General 82	Total 107
1. Use a Computer or laptop from	1 – 5 years	3 (12%)	19 (23%)	22 (21%)
	6 – 10 years	6 (24%)	21 (26%)	27 (25%)
	More than ten years	16 (64%)	42 (51%)	58 (54%)
2. Use a Smartphone from	Less than a year	0	0	0
	1 - 5 years	2 (8%)	13 (16%)	15 (14%)
	More than five years	23 (92%)	69 (84%)	92 (86%)
3. Use the Internet for	Recreational	17 (68%)	50 (61%)	67 (63%)
	Preparing for class lecture	20 (80%)	65 (79%)	85 (79%)
	Updating knowledge	22 (88%)	71 (87%)	93 (87%)
	Research work	16 (64%)	41 (50%)	57 (53%)
4. Access to the Internet	Very rarely	0	2 (3%)	2 (2%)
	Occasionally	1 (4%)	5 (6%)	6 (5%)
	A few times a week	1 (4%)	2 (3%)	3 (3%)
	Every day	23 (92 %)	73 (89%)	96 (90%)
5. Access to the network from the institution	No	2 (8%)	13 (16%)	15 (14%)
	Yes	23 (92%)	69 (84%)	92(86%)

Computers and laptops were now an essential part of the teaching and learning process. They offered numerous benefits, including increased motivation and interest in technology among teachers, the development of technological skills and confidence, staying updated with recent knowledge, managing class

participation, creating student-centred classes, enhancing collaboration among students, and catering to different learning styles. The above table (Table 4.5) showed that 12% of teachers from professional colleges used computers or laptops in the last 1–5 years, 24% of teachers from the previous 6–10 years, and the majority of them (64%) were using computers or laptops for more than ten years. When it comes to general degree colleges, it could be seen that 23% of teachers used computers or laptops in the last 1–5 years, 26% of teachers used from the previous 6–10 years, and the majority (51%) of them used computers or laptops for more than ten years. However, it could be seen from Table 4.5 that the majority (54%) of the teachers from both professional colleges and general degree colleges used computers or laptops for more than ten years; 21% of college teachers used computers or laptops from the last 1–5 years and 25% of them used computers or laptops from the previous 6–10 years.

Teachers kept smartphones, making them accessible regardless of when and where they were. Smartphones improved teaching and learning experiences by providing flexible course delivery and access to learning materials. It was a practical communication tool, enabling them to maintain relationships with students. As Table 4.5 showed that 8% of teachers from professional colleges used smartphones in the last 1–5 years, and the majority (92%) used smartphones for more than five years among professional college teachers. Table 4.5 also revealed that 14% of teachers from general degree colleges used smartphones in the last 1–5 years, and the majority (84%) used smartphones for more than five years. Therefore, the table clearly stated that the majority (86%) of the college teachers in Mizoram had used smartphones for over five years, and 14% had just been using them for the previous 1–5 years.

The internet has become essential to our daily lives, impacting various aspects, including education. Table 4.5 shows that the majority of the teachers (88%) from professional colleges were using the internet for updating their knowledge; 80% of them used it for preparation of their class lectures; 68% of teachers were using the internet for recreation; and 64% of the teachers used the internet for their research work. Among the teachers of general degree colleges, 87% of the teachers were

using it for updating their knowledge; 79% of the teachers used the internet for preparing their class lectures; 61% of teachers used the internet for recreation, and 50% of teachers used the internet for their research work. Hence, the given table reveals that 87% of them used it for updating their knowledge; 79% of teachers used it for preparing their class lectures; 63% of college teachers in Mizoram used the internet for recreation, and 53% of the teachers used the internet for their research work.

The advent of the internet altered many aspects of interactions between people; acquiring information, practising business, educating ourselves, and engaging with one another had all changed considerably because of the internet, which might have been the reason why the majority (92%) of the teachers from the professional colleges in Mizoram accessed the internet every day; and 4% of teachers access to the internet a few times a week and occasionally. Table 4.5 revealed that only 3% of teachers from general degree colleges had accessed the internet very rarely; 6% of teachers accessed the internet occasionally; and 3% of teachers accessed the internet a few times a week, and the majority (89%) of the teachers from general degree colleges were accessing the internet every day. Thus, it could be seen from Table 4.5 that the majority (90%) of the college teachers in Mizoram were accessing the internet daily. Only 2% of the teachers had accessed it very rarely, 5% accessed it occasionally, and 3% accessed the internet a few times a week.

Users can access the internet at their own discretion, choosing when and how they engaged with it. Therefore, it could be observed from Table 4.5 that among professional college teachers, the majority (92%) accessed the internet from their institutions, while the remaining 8% did not. Simultaneously, a substantial 84% of teachers from general degree colleges accessed the internet from their institutions, with the remaining 14% not having access. Thus, it could be concluded that the majority (86%) of college teachers in Mizoram were accessing the internet from their institutions, while 14% did not have such access. It can be assumed that those teachers without internet access from their institutions found access at home or other convenient locations.

Table 4.6

**Web-based Learning Resources being accessed by the Teachers of Professional
and General Degree Colleges in Mizoram (Item 6 – 9)**

Items / Statements	<i>Label</i>	<i>Responses</i>		
		<i>Professional</i> 25	<i>General</i> 82	<i>Total</i> 107
6.Social Media Platform	Instagram	18 (72%)	48 (58%)	66 (61%)
	Facebook	21 (84%)	54 (66%)	75 (70%)
	WhatsApp	25 (100%)	79 (96%)	104 (97%)
	YouTube	23 (92%)	68 (83%)	91 (85%)
	Twitter	9 (36%)	18 (22%)	27 (25%)
	Telegram	12 (48 %)	37 (45%)	49 (46%)
7. Websites and Academic Platforms	LinkedIn	2 (8%)	11 (13%)	13 (12%)
	Wikipedia	16 (64%)	37 (45%)	53 (50%)
	Academia.edu	12 (48%)	21 (25%)	33 (31%)
	ResearchGate	15 (60%)	27 (32%)	42 (39%)
8. Apps for Online Interaction (academic)	Google Classroom	12 (48%)	48 (58%)	60 (56%)
	WebEx	8 (32%)	16 (19%)	24 (22%)
	Zoom	22 (88%)	73 (89%)	95 (89%)
	Google Meet	23 (92%)	68 (82%)	91 (85%)
9. Online personal space other than social networking sites	Yes	8 (32%)	34 (41%)	42 (39%)
	No	17 (68%)	48 (59%)	65 (61%)

Social media platforms were online services that enabled users to interact with others share and create content, and take part in online communities. These platforms were diverse and had different purposes, but they all facilitate user interaction and engagement. So, it could be seen from Table 4.6 that among the various social media platforms, WhatsApp was the most (100%)used social media

platform by the teachers from professional colleges in Mizoram, followed by YouTube (92%), Facebook (84%), Instagram (72%), Telegram (48%), and lastly Twitter (39%). At the same time, among the general degree college teachers, WhatsApp was also the most (96%) used social media platform, followed by YouTube (83%), Facebook (66%), Instagram (58%), Telegram (45%), and Twitter (22%). The table indicated that WhatsApp was the most (97%) used social media platform among the teachers of professional and general degree colleges in Mizoram, followed by YouTube (85%), Facebook (70%), Instagram (61%), Telegram (46%), and Twitter (25%).

Teachers' lives as professionals were greatly impacted by websites and academic platforms, which provide extensive tools, resources and opportunities for improving their teaching skills and boosting their professions. As Table 4.6 indicated, Wikipedia was the most used (64%) website and academic platform by teachers at professional colleges, followed by ResearchGate (60%), Academia.edu (48%), and LinkedIn (8%). The given table also showed that Wikipedia was the most (45%) used website and academic platform by the teachers from general degree colleges, followed by ResearchGate (32%), Academia.edu (25%) and LinkedIn (13%). It was clear from the table that Wikipedia was the most (50%) used website and academic platform by the teachers from professional and general degree colleges, followed by ResearchGate (39%), Academia.edu (31%), and LinkedIn (12%). Thus, it could be said that with the help of websites and academic platforms, teachers may acquire teaching techniques, stay up-to-date with best practices, and broaden their knowledge and proficiency in their subject areas. Teachers could benefit more by engaging themselves with certain educational websites and academic platforms.

Teachers used a technology-based tool for instruction known as online learning apps, which enabled them to create, host, and disseminate learning materials that students could access anytime via computers, laptops, smartphones, and tablets. The above table (Table 4.6) showed that the different types of apps used for online interaction (academic) and their engagement regularity. It indicated that the majority (92%) of professional college teachers used the Google Meet application software for

online academic interaction, followed by Zoom (88%), Google Classroom (48%), and WebEx (32%). It also revealed that the majority (89%) of the teachers from the general degree colleges used Zoom for online academic interaction, followed by Google Meet (82%), Google Classroom (58%), and WebEx (19%). Thus, it could be said that the majority of the college teachers in Mizoram used Zoom apps for online academic interaction, followed by Google Meet (85%), Google Classroom (56%), and WebEx (22%).

However, Table 4.6 showed that only 32% of teachers from professional colleges have online personal space other than social networking sites, such as blogs, and the majority (68%) of the teachers did not have any online personal space. Among the general degree colleges, it was also found that 41% of teachers have online personal space other than social networking sites, such as blogs. Therefore, looking at the above table, it can be said that 59% of college teachers in Mizoram did not have any online personal space; at the same time, the majority (61%) of the college teachers did not have any online personal space other than social networking sites.

Table 4.7

Web-based Learning Resources being accessed by the Teachers of Professional and General Degree Colleges in Mizoram (Item 10-15)

Items / Statements	Label	Responses		
		Professional 25	General 82	Total 107
10. Use a Search engine	Google	25 (100%)	81 (99%)	106 (99%)
	Yahoo	2 (8%)	10 (12%)	12 (11%)
	UC Browser	4 (16%)	28 (34%)	32 (30%)
11. Awareness of online sources	Friends / Colleagues	17 (68%)	54 (66%)	71 (66%)
	Family	5 (20%)	17 (21%)	22 (21%)
	Institution initiatives	13 (52%)	43 (52%)	56 (52%)
	Media	19 (76%)	57 (70%)	76 (71%)
12. Organized Orientation Programme on Web-based or ICT	Yes	19 (76%)	62 (76%)	81 (76%)
	No	6 (24%)	20 (24%)	26 (24%)
13. Basic computer knowledge	Excellent	5 (20%)	9 (11%)	14 (13%)
	Good	6 (24%)	22 (27%)	28 (26%)
	Average	13 (52%)	44 (54%)	57 (53%)
	Poor	1 (4%)	7 (8%)	8 (8%)
14. Ability to handle a Web-based facility or ICT in teaching-learning	High	5 (20%)	10 (12%)	15 (14%)
	Medium	19 (76%)	60 (73%)	79 (74%)
	Low	1 (4%)	12 (15%)	13 (12%)
15. Preferred teaching type	Conventional/ Traditional	14 (56%)	49 (60%)	63 (59%)
	Modern/Contemporary (Use of ICT or Web-based)	11 (44%)	33 (40%)	44 (41%)

A search engine was a software application that utilised keywords or phrases to help users find the information they sought online. As shown in Table 4.7, it could be observed that all the teachers from professional colleges used the Google search engine to seek additional information; 8% of teachers relied on the Yahoo search engine, and 16% used the UC Browser search engine. It also indicated that the majority (99%) of teachers from general degree colleges employed the Google search engine to search for specific information, while 12% utilised the Yahoo search engine and 34% opted for the UC Browser search engine. The table (Table 4.7) illustrates that the majority (99%) of college teachers in Mizoram used Google search engines; 11% of them used the Yahoo search engine, and 30% of teachers turned to the UC Browser for information retrieval.

In the digital age, fostering critical thinking, digital literacy, informed decision-making, and responsible citizenship requires public knowledge of sources on the internet. It was essential to understand how people learn about the internet. Therefore, it was found that the majority (76%) of the teachers were acquainted with online sources from various media outlets, 68% of teachers from professional colleges learned about online sources through their friends, 52% of teachers via institutional initiatives, and 20% of them from their families. At the same time, the majority (69%) of the teachers learned about online sources from the media; 65% of the teachers from general degree colleges reported learning about online sources from their friends; 52% of the teachers from institutional initiatives; and 20% of the teachers from their families. The majority (71%) of the college teachers in Mizoram acknowledged online sources from the media, followed by 66% of teachers from their friends or colleagues, 21% of teachers from their families and 52% from the initiative taken by their respective institutions.

Organising orientation programmes on web-based or ICT was necessary to ensure that participants had the knowledge, skills, and support they needed to succeed in the online learning environment. So, it could be seen from Table 4.7 that the extent to which the institutions organized orientation programmes on web-based learning or ICT. It revealed that the majority (76%) of the teachers from professional colleges responded that their institutions organized an orientation programme on

web-based or ICT; the remaining 24% of teachers stated that their institutions did not organize an orientation programme on web-based or ICT. The above table (Table 4.7) also showed that the majority (76%) of the teachers from general degree colleges responded that their institutions organized an orientation programme on web-based or ICT, while 24% of the teachers responded that their institutions did not organize an orientation programme on web-based or ICT. However, Table 4.7 revealed that the majority (76%) of the college teachers from professional and general degree colleges in Mizoram responded that their institutions organized an orientation programme on web-based or ICT, and the remaining 24% of the teachers responded that their institutions do not organize orientation programmes. It was evident that by providing orientation and training upfront, institutions can set themselves up for success and maximise the effectiveness of their web-based learning or ICT initiatives.

Understanding the operation and usage of computers was known as computer knowledge. This might have involved typing, learning keyboard shortcuts, turning computers on and off, and understanding how to link computers to the internet. So, the above table (Table 4.7) clearly stated that 20% of the teachers from the professional colleges had excellent computer-basic knowledge; 24% of them assumed that they had good computer-basic knowledge; the majority (52%) of the teachers had average computer-basic knowledge; and the remaining 4% of the teachers responded that they had poor computer-basic knowledge. Table 4.7 also revealed that from the general degree colleges, 11% of the teachers had excellent computer-basic knowledge; 27% of them said that they had good computer-basic knowledge; the majority (54%) of them considered themselves ‘average’ computer-basic knowledge; and 8% of the teachers labelled themselves poor in computer-basic knowledge. From the overall responses, it could be seen that the majority (53%) of the teachers from professional and general degree colleges in Mizoram had average computer basic knowledge. A total 13% of the teachers had excellent computer-basic knowledge, 26% of the teachers had good computer-basic knowledge, and 8% had poor computer-basic knowledge. Familiarity with computer basics could help in

understanding various application programs and operating systems, which was essential for teachers to cope with their teaching process.

Table 4.7 showed that the majority (76%) of the teachers from professional colleges had medium ability in handling web-based facilities or ICT for teaching and learning; 20% of the teachers had high ability in handling web-based facilities or ICT for teaching-learning; and 4% of the teachers had low ability in handling web-based facilities or ICT for teaching and learning. It also showed that the majority (75%) of teachers from the general degree colleges had medium ability in handling web-based facilities or ICT in teaching-learning; 15% of teachers had low ability in handling web-based facilities or ICT in teaching-learning, and 12% of the teachers had high ability in handling web-based facilities or ICT in teaching-learning. From the total respondents, it could be stated that the majority (74%) of the college teachers in Mizoram had medium ability to handle web-based facilities or ICT in teaching-learning; 14% of the teachers had high ability in handling web-based facilities or ICT, and 12% of college teachers had low ability in handling web-based facilities or ICT for teaching-learning.

The given table (Table 4.7) revealed that the majority (56%) of teachers from professional colleges preferred a conventional or traditional type of teaching, and 44% of teachers preferred a modern or contemporary (use of ICT or web-based) kind of teaching. It could also be seen from Table 4.7 that the majority (60%) of the teachers from the general degree colleges preferred a traditional type of teaching, and 40% of the teachers preferred to use a modern or contemporary type of teaching. So, it could be concluded that the majority (59%) of the college teachers in Mizoram preferred conventional teaching. In contrast to that, 41% of the teachers preferred modern or contemporary types of teaching that was, the use of ICT or web-based technology.

Table 4.8

**Web-based Learning Resources being accessed by the Teachers of Professional
and General Degree Colleges in Mizoram (Item 16)**

16.Application software familiar with and used				
<i>Label</i>	<i>How often do you use it?</i>	<i>Professional 25</i>	<i>General 82</i>	<i>Total 107</i>
MS Office	Always	25 (100%)	66 (80%)	91 (85%)
	Sometimes	0	14 (17%)	14 (13%)
	Never	0	2 (2%)	2 (2%)
Media Player	Always	6 (24%)	13 (16%)	19 (17%)
	Sometimes	13 (52%)	40 (49%)	53 (50%)
	Never	6 (24%)	29 (35%)	35 (33%)
Accounting Software	Always	3 (12%)	7 (9%)	10 (9%)
	Sometimes	4 (16%)	21 (26%)	25 (23%)
	Never	18 (72%)	54 (66%)	72 (67%)
Web Conferencing	Always	13 (52%)	40 (49%)	53 (50%)
	Sometimes	7 (28%)	31 (38%)	38 (35%)
	Never	5 (20%)	11 (13%)	16 (15%)
Anti-virus	Always	12 (48%)	34 (41%)	46 (43%)
	Sometimes	8 (32%)	37 (45%)	45 (42%)
	Never	5 (20%)	11 (14%)	16 (15%)
Graphic Design Software	Always	1 (4%)	3 (4%)	4 (4%)
	Sometimes	7 (28%)	7 (8%)	14 (13%)
	Never	17 (68%)	72 (88%)	89 (83%)
Digital Audio Workstation	Always	1 (4%)	2 (2%)	3 (3%)
	Sometimes	4 (16%)	10 (12%)	14 (13%)
	Never	20 (80%)	70 (86%)	90 (84%)

Application software was a computer program designed to carry out a particular task, whether it was for business, personal or educational. It was also referred to as a productivity program or an end-user program, assisting users to accomplish their functions smoothly.

Microsoft Office (MS Office) was a suite of productivity software, including a collection of applications designed to help users create, edit, manage and share various types of documents, presentations, spreadsheets, and communication. So, looking at Table 4.8, it was obvious that all (100%) teachers from the professional colleges were ‘always’ using MS Office. At the same time, the majority (80%) of the teachers from the general degree colleges also ‘always’ used MS Office; 17% of the teachers ‘sometimes’ used MS Office, and 2% of them ‘never’ used MS Office. However, it was also found that the majority (85%) of the college teachers in Mizoram ‘always’ used MS Office; 13% of them ‘sometimes’ used MS Office, and 2% of teachers ‘never’ used MS Office.

A media player, which was a computer application that could save, copy, and play sound and image data, was ‘always’ used by 24% of the teachers among the professional colleges, 52% of them ‘sometimes’ used media players, and 24% of the teachers ‘never’ used media players. However, 16% of the teachers always used media players from general degree colleges, 49% of the teachers sometimes used media players, and 35% of the teachers never used media players. Looking at Table 4.8, it can be said that 50% of the teachers sometimes used media players, 17% of the teachers always used media players, and 33% of the teachers never used media players.

Accounting software was a computer programme that enabled the recording, tracking, and reporting of an organisation’s financial activities and accounts in an electronic and often automated manner. The familiarity of college teachers with accounting software in Mizoram was evident in Table 4.8. Among professional colleges, the majority (72%) of teachers had never used accounting software, while 16% had sometimes used it, and 12% had always used it. In general degree colleges, most (66%) had ‘never’ used accounting software; 26% had ‘sometimes’ used it; and 9% of teachers had ‘always’ used accounting software. Among all college teachers in Mizoram, the majority (67%) had never used accounting software, 23% had occasionally used it, and 9% had always used accounting software.

Web conferencing enabled interactive online technology that encompassed many forms of distant cooperation, such as collaboration via an internet connection. It was the method of conducting real-time online meetings through screen sharing, video, and audio. So, among the professional colleges, web conferencing was ‘always’ used by the majority (52%) of teachers, 28% of the teachers sometimes used web conferencing, and 20% of them had ‘never’ used web conferencing. At the same time, the majority (49%) of the teachers from the general degree colleges in Mizoram used web conferencing ‘always’; 38% of them ‘sometimes’; and 13% of the teachers responded as ‘never’ regarding the use of web conferencing. When it comes to all college teachers of Mizoram, the majority (50%) of the teachers responded as ‘always’, 35% of the teachers mentioned ‘sometimes’, and 15% of the college teachers in Mizoram had ‘never’ used web conferencing.

Antivirus software was used to prevent, scan for, identify, and remove viruses from computers. Table 4.8 showed the familiarity and usage of antivirus among professional college teachers. It stated that 48% of teachers used antivirus 'always', 32% of the teachers 'sometimes', and 10% of the teachers 'never' used antivirus. The table also stated that the majority (45%) of teachers from the general degree colleges 'sometimes' used antivirus; 41% of the teachers 'always' used antivirus; and 14% of them 'never' used antivirus. It could be seen from Table 4.8 that the majority (43%) of the teachers 'always' used antivirus, 42% of the teachers 'sometimes' used antivirus, and 15% of the college teachers in Mizoram 'never' used antivirus.

Graphic design software was defined as a type of computer program or application that was used for creating, editing, and manipulating images. Table 4.8 revealed that among professional colleges, the majority (68%) of teachers ‘never’ used graphic design software; 28% ‘sometimes’ used it, and only 4% ‘always’ used it. Similarly, among general degree colleges, the majority (88%) of teachers ‘never’ used graphic design software, with 28% ‘sometimes’ using it and 4% ‘always’ using it. Therefore, it was evident that the vast majority (83%) of college teachers in Mizoram ‘never’ used graphic design software, while 13% ‘sometimes’ used it, and a mere 4% ‘always’ used it.

A digital audio workstation was an audio production software or platform designed for recording, editing, mixing, and mastering digital audio files. Table 4.8 showed that the majority (80%) of teachers from professional colleges ‘never’ used digital audio workstation, while 16% ‘sometimes’ used them, and 4% ‘always’ used them. Among teachers from general degree colleges, the majority (86%) ‘never’ used digital audio workstation; conversely, 2% ‘always’ used them, and another 2% ‘sometimes’ used them. Overall, it was concluded that the majority (84%) of college teachers in Mizoram ‘never’ used digital audio workstation. However, 13% ‘sometimes’ used them, and 3% ‘always’ used a digital audio workstation.

Table 4.9
Web-based Learning Resources being accessed by the Teachers of Professional and General Degree Colleges in Mizoram (Item 17)

17.Application software familiar with and used				
Label	<i>Level your proficiency</i>	<i>Professional 25</i>	<i>General 82</i>	<i>Total 107</i>
MS Office	Excellent	16 (64%)	27 (33%)	43 (40%)
	Good	7 (2%)	47 (57%)	54 (50%)
	Poor	2 (8%)	8 (10%)	10 (10%)
Media Player	Excellent	8 (16%)	10 (12%)	18 (17%)
	Good	12 (48%)	59 (72%)	71 (66%)
	Poor	5 (20%)	13 (16%)	18 (17%)
Accounting Software	Excellent	2 (8%)	10 (12%)	12 (11%)
	Good	3 (12%)	15 (18%)	18 (17%)
	Poor	20 (80%)	57 (70%)	77 (72%)
Web conferencing	Excellent	10 (40%)	20 (25%)	30 (28%)
	Good	10 (40%)	56 (68%)	66 (62%)
	Poor	5 (20%)	6 (7%)	11 (10%)
Anti-virus	Very Regularly	5 (20%)	28 (34%)	33 (31%)
	Regularly	16 (64%)	48 (59%)	64 (60%)
	Not Regularly	4 (16%)	6 (7%)	10 (9%)

Graphic Design Software	Excellent	1 (4%)	3 (4%)	4 (4%)
	Good	20 (80%)	11 (13%)	31 (29%)
	Poor	4 (16%)	68 (83%)	72 (67%)
Digital Audio Workstation	Excellent	1 (4%)	2 (2%)	3 (3%)
	Good	4 (16%)	8 (10%)	12 (14%)
	Poor	20 (80%)	72 (88%)	92 (86%)

The above table (Table 4.9) revealed the level of proficiency in application software used by professional college teachers. The table stated that the majority (64%) of the teachers labelled themselves as ‘excellent’ in using MS Office, 2% of the teachers responded that they were ‘good’ in MS Office, and 8% of the teachers said that they were ‘poor’ in using MS Office. Meanwhile, among the general degree colleges, 33% of the teachers had ‘excellent’ proficiency in using MS Office, 57% of the teachers had ‘good’ proficiency, and 10% of the teachers had ‘poor’ proficiency. It is evident that the majority (50%) of the college teachers in Mizoram were ‘good’ in MS Office; 40% of the teachers had ‘excellent’ proficiency in using MS Office, and 10% of the teachers had ‘poor’ proficiency in using MS Office.

The above table (Table 4.9) clearly signified that among the professional college teachers in Mizoram, the majority (72%) of the teachers were ‘good’ in using media players; 16% of the respondents were ‘excellent’ in using it; and 12% of the teachers were ‘poor’ in using media players. Among the general degree colleges, the majority (72%) of the teachers had ‘good’ proficiency in using media players, 16% of teachers had ‘poor’ proficiency, and 12% of the teachers were ‘excellent’ in using media players. Table 4.9 clearly stated that the majority (66%) of the college teachers in Mizoram had ‘good’ proficiency in using media players; 17% of them had ‘excellent’ proficiency, and 17% of the teachers had ‘poor’ proficiency in using media players.

It could be also seen from Table 4.9 that the majority (80%) of the teachers had ‘poor’ proficiency in using accounting software; 12% of the teachers had ‘good’ proficiency, and 8% of the teachers from the professional colleges had ‘excellent’

proficiency in using accounting software. Table 4.9 described that the majority (70%) of the teachers from general degree colleges had ‘poor’ proficiency in using accounting software; 12% of the teachers had ‘excellent’ proficiency in accounting software, and 18% of them had a ‘good’ proficiency in accounting software. From the overall responses, the majority (72%) of the college teachers in Mizoram had ‘poor’ proficiency in using accounting software; 17% of the college teachers had ‘good’ proficiency in accounting software, and 12% of the college teachers had ‘excellent’ proficiency in accounting software.

It was evident from the given table that 40% of the teachers from professional colleges had ‘excellent’ proficiency in web conferencing, 40% of the teachers had ‘good’ proficiency, and 20% of them had ‘poor’ proficiency in using web conferencing. Among the general degree colleges, the majority (68%) of the general college teachers had ‘good’ proficiency in using web conferencing; 25% of the teachers had ‘excellent’ proficiency, and only 7% of the teachers had ‘poor’ proficiency in web conferencing. Accordingly, the majority (62%) of the college teachers had ‘good’ proficiency; 28% of the college teachers in Mizoram had ‘poor’ proficiency in using web conferencing, and only 10% of the college teachers in Mizoram had ‘poor’ proficiency in web conferencing.

Table 4.9 showed that the majority (64%) of the teachers from the professional colleges used anti-viruses ‘regularly’; 20% of them used ‘very regularly’, and 16% of the teachers used anti-virus ‘not regularly’. At the same time, the majority (59%) of the teachers from general degree colleges used anti-virus ‘regularly’; 34% of them used ‘very regularly’, and only 7% of the teachers used anti-virus ‘not regularly’. Among the college teachers in Mizoram, the majority (60%) of them used anti-virus ‘regularly’; 31% used ‘very regularly’, and only 9% used anti-virus ‘not regularly’.

The majority (80%) of the teachers from the professional college in Mizoram had ‘good’ proficiency in using graphic design software; 16% of the teachers were ‘poor’, and only 4% of the teachers had ‘excellent’ proficiency in using graphic design software. Among the general degree colleges, the majority (83%) of the

teachers had 'poor' level of proficiency in using graphic design software; 13% of the teachers were 'good' in using it; and only 4% of the teachers were 'excellent' in using graphic design software. It can be concluded that the majority (67%) of the college teachers in Mizoram had 'poor' proficiency in using graphic design software; 31% of them had 'excellent' proficiency in using graphic design software, and 29% of them had 'good' proficiency in using graphic design software.

Among the professional colleges, the majority (80%) of the teachers were 'poor' in using digital audio workstations; 16% of them had 'good' proficiency, and only 4% of the respondents had 'excellent' proficiency in digital audio workstations. The majority (88%) of teachers from general degree colleges had 'poor' proficiency in using digital audio workstations; 10% of them had 'good' proficiency, and only 2% of the respondents had 'excellent' proficiency in using digital audio workstations. Consequently, the majority (86%) of the college teachers in Mizoram had poor proficiency in using digital workstations; 14% of the college teachers had 'good' proficiency, and only 3% of them had 'excellent' in using digital audio workstations.

Table 4.10

**Web-based Learning Resources being accessed by the Teachers of Professional
and General Degree Colleges in Mizoram (Item 18)**

18. System software familiar with and used				
<i>Label</i>	<i>How often do you use it?</i>	<i>Professional 25</i>	<i>General 82</i>	<i>Total 107</i>
Windows	Always	23 (92%)	65 (79%)	88 (82%)
	Sometimes	1 (4%)	15 (18%)	16 (15%)
	Never	1 (4%)	2 (3%)	3 (3%)
Linux	Always	4 (16%)	4 (5%)	8 (7%)
	Sometimes	4 (16%)	15 (18%)	19 (18%)
	Never	17 (48%)	63 (77%)	80 (75%)
iOS	Always	9 (36%)	19 (23%)	28 (26%)
	Sometimes	2 (8%)	10 (12%)	12 (11%)
	Never	14 (56%)	53 (65%)	67 (63%)
Android	Always	18 (72%)	54 (66%)	72 (67%)
	Sometimes	3 (12%)	24 (29%)	27 (25%)
	Never	4 (16%)	4 (5%)	8 (8%)
Macintosh	Always	3 (12%)	14 (17%)	17 (16%)
	Sometimes	9 (36%)	10 (12%)	19 (18%)
	Never	13 (52%)	58 (71%)	71 (66%)

System software facilitated the management of a device's internal operations. It might also assist users in managing the processor units and output devices. It serves as an interface between the user and the hardware.

Windows was a graphical operating system developed by Microsoft. It enabled users to view and store files, play games, watch videos, run software, and connect to the internet. Table 4.10 revealed that the majority (92%) of teachers from professional colleges 'always' used Windows. Only 4% 'sometimes' used Windows,

and the remaining 4% 'never' used it. Similarly, the table highlighted that the majority (79%) of teachers from general degree colleges 'always' used Windows, 18% 'sometimes' used it, and only 3% 'never' used it. Therefore, it was clear that the majority (82%) of college teachers 'always' used Windows. Additionally, 15% 'sometimes' used it, and only 3% of college teachers in Mizoram 'never' used Windows.

Linux, an open-source and community-developed operating system (OS) used for computers, servers, mainframes, mobile, and embedded devices, was observed to have varying usage patterns among college teachers. Table 4.10 indicated that 48% of teachers from professional colleges 'never' used Linux, while 16% 'always' used it, and another 16% 'sometimes' used this system software. In general degree colleges, the majority (77%) of teachers 'never' used Linux; however, 18% 'sometimes' used it, and only 5% 'always' used it. Consequently, it could be stated that the majority (75%) of college teachers in Mizoram 'never' used Linux. Conversely, 18% 'sometimes' used Linux, and only 7% 'always' used it.

The acronym 'iOS' stood for 'iPhone Operating System.' It was the operating system that powered Apple's iPad and iPhone gadgets. It acted similarly to computer software, managing the device's operations and serving as a platform for other applications to run on; it could also be called the 'brain' for iPads or iPhones. Subsequently, the majority (56%) of teachers from professional colleges 'never' used iOS, 36% 'always' used iOS, and 8% 'sometimes' used it. At the same time, among the general degree colleges, the majority (65%) of teachers 'never' used iOS, 23% 'always' used iOS, and 12% 'sometimes' used it. However, it could be concluded that the majority (63%) of college teachers in Mizoram 'never' used iOS; 26% 'always' used it, and 11% 'sometimes' used it.

Android was an operating system for mobile phones developed by Google. The majority (72%) of teachers from professional degree colleges 'always' used Android; it was also 'sometimes' used by 13% of the teachers, and the remaining 16% 'never' used Android. Similarly, the majority (66%) of teachers from general degree colleges 'always' used Android system software; 29% 'sometimes' used

Android, and only 5% ‘never’ used it. Thus, Table 4.10 signified that the majority (67%) of college teachers in Mizoram ‘always’ used Android; it was also ‘sometimes’ used by 25% of college teachers, and only 8% of college teachers in Mizoram ‘never’ used Android.

A Macintosh, commonly referred to as a Mac, was a line of personal computers created, produced, and made available by Apple Inc. Among teachers from professional colleges, Macintosh was 'always' used by 12%, 'sometimes' used by 36%, and 'never' used by the majority (52%). Concurrently, among teachers from general degree colleges, 17% ‘always’ used Macintosh, 12% 'sometimes' used it, and the majority (71%) 'never' used it. It could be clearly stated that 16% of college teachers in Mizoram 'always' used Macintosh, 18% 'sometimes' used it, and the majority (66%) 'never' used Macintosh.

Table 4.11

Web-based Learning Resources being accessed by the Teachers of Professional and General Degree Colleges in Mizoram (Item 19)

19.System software familiar with and used				
Label	<i>Label your proficiency</i>	<i>Professional 25</i>	<i>General 82</i>	<i>Total 107</i>
Windows	Excellent	10 (40%)	29 (35%)	39 (36%)
	Good	14 (56%)	50 (61%)	64 (60%)
	Poor	1 (7%)	3 (4%)	4 (4%)
Linux	Excellent	2 (8%)	4 (5%)	6 (6%)
	Good	2 (8%)	11 (13%)	13 (12%)
	Poor	21 (84%)	67 (82%)	88 (82%)
iOS	Excellent	7 (36%)	14 (17%)	21 (20%)
	Good	2 (8%)	7 (9%)	9 (8%)
	Poor	16 (64%)	61 (74%)	77 (72%)
Android	Excellent	16 (64%)	32 (34%)	48 (33%)
	Good	6 (48%)	45 (52%)	51 (50%)
	Poor	3 (12%)	5 (6%)	8 (5%)

Macintosh	Excellent	3 (12%)	9 (11%)	12 (12%)
	Good	9 (36%)	15 (18%)	24 (22%)
	Poor	13 (52%)	58 (71%)	71 (66%)

Table 4.11 showed that the majority (56%) of professional college teachers had ‘good’ proficiency in using Windows. Additionally, 40% had ‘excellent’ proficiency, and only 7% had ‘poor’ proficiency. The table also displayed that among general degree college teachers, the majority (61%) had ‘good’ proficiency, 35% had ‘excellent’ proficiency, and only 4% had ‘poor’ proficiency in using Windows. Therefore, it could be concluded that the majority (60%) of all college teachers in Mizoram had ‘good’ proficiency in using Windows. Furthermore, 36% had ‘excellent’ proficiency, and only 4% had ‘poor’ proficiency.

It was found that the majority (84%) of teachers from professional colleges had ‘poor’ proficiency at handling Linux. Conversely, 8% had ‘excellent’ proficiency, and the remaining 8% were ‘good’ at using Linux. Table 4.11 also showed that the majority (82%) of teachers from general degree colleges were ‘poor’ at handling Linux. However, 13% had ‘good’ proficiency, and only 5% had ‘excellent’ proficiency in Linux. Hence, it could be concluded that the majority (82%) of college teachers in Mizoram had ‘poor’ proficiency at handling Linux. Meanwhile, 12% were ‘good’ at using Linux, and the remaining 6% were ‘excellent’.

Table 4.11 revealed that the majority (64%) of teachers from professional colleges were 'poor' in using iOS. Additionally, 36% were 'excellent', and 8% were 'good' in iOS proficiency. The table also showed that the majority (74%) of teachers from general degree colleges had 'poor' proficiency in using iOS, while 17% had 'excellent' proficiency, and 9% had 'good' proficiency. Therefore, it could be stated that the majority (72%) of college teachers in Mizoram had 'poor' proficiency in using iOS, 20% had 'excellent' proficiency, and only 8% had 'good' proficiency.

Regarding Android proficiency, the majority (64%) of professional college teachers had 'excellent' proficiency. Furthermore, 48% had 'good' proficiency, and 6% had a 'poor' level of proficiency. Meanwhile, the majority (52%) of teachers from

general degree colleges had 'good' proficiency, 34% had 'excellent' proficiency in using Android, and 6% had 'poor' proficiency. Thus, it was clear that the majority (50%) of all college teachers in Mizoram had 'good' proficiency in using Android. Additionally, 33% had 'excellent' proficiency, and only 5% had 'poor' proficiency in using Android.

Table 4.11 made it evident that the majority (52%) of teachers from professional colleges had 'poor' proficiency in using Macintosh. Conversely, 36% had 'good' proficiency, and 12% had 'excellent' proficiency. At the same time, the majority (71%) of teachers from general degree colleges had 'poor' proficiency in using Macintosh. Additionally, 18% had 'good' proficiency, and 11% had 'excellent' proficiency. Therefore, the majority (66%) of all college teachers in Mizoram had 'poor' proficiency in Macintosh. However, 22% had 'good' proficiency, and 12% had 'excellent' proficiency.

Table 4.12

Web-based Learning Resources being accessed by the Teachers of Professional and General Degree Colleges in Mizoram (Item 20-26)

Items / Statements	Label	Responses		
		Professional 25	General 82	Total 107
20. Attending Educational Online Programmes or Live Telecast Lectures in your Institution	Yes	20 (80%)	68 (83%)	88 (82%)
	No	5 (20%)	14 (12%)	19 (18%)
21. Rate the Web-based Facilities in your Institution.	Adequate	7 (28%)	21 (25%)	28 (26%)
	Inadequate	9 (36%)	17 (21%)	26 (24%)
	Moderate	9 (36%)	44 (54%)	53 (50%)
22. Problems Faced during Online Classes	Motivating students	11 (44%)	36 (44%)	47 (41%)
	Tracking students work or assignment	10 (40%)	23 (28%)	33 (31%)

	Lack of computer literacy skills	2 (8%)	13 (16%)	15 (14%)
	Network or internet connection failure	22 (88%)	72 (88%)	94 (88%)
	Problems in handling the online interface	4 (16%)	24 (29%)	28 (26%)
	Time management	5 (20%)	15 (18%)	20 (19%)
23. How would you like to receive students' assignments?	Softcopy	7 (28%)	28 (34%)	35 (33%)
	Hardcopy	18 (72%)	54 (66%)	72 (67%)
24. Online Classes taken during the COVID-19 Pandemic	Very rarely	0	2 (2%)	2 (2%)
	Occasionally	2 (8%)	6 (7%)	8 (7%)
	A few times a week	16 (64%)	53 (65%)	69 (65%)
	Everyday	7 (28%)	21 (26%)	28 (26%)
25. Satisfaction with Online Classes taken during the COVID-19 Pandemic	Very satisfied	2 (8%)	5 (6%)	7 (7%)
	Satisfied	9 (36%)	41 (50%)	50 (47%)
	Slightly satisfied	10 (40%)	29 (35%)	39 (36%)
	Dissatisfied	4 (16%)	7 (9%)	11 (10%)
26. Satisfaction with the course or syllabus covered during the COVID-19 pandemic	Very satisfied	16 (64%)	54 (66%)	70 (66%)
	Satisfied	7 (28%)	20 (24%)	27 (25%)
	Slightly satisfied	1 (4%)	6 (7%)	7 (6%)
	Dissatisfied	1 (4%)	2 (2%)	3 (3%)

The widespread adoption and understanding of online educational programs, live telecast lectures, and synchronous and asynchronous learning for classes and webinars largely emerged after the pandemic outbreak. This increased engagement

with digital learning platforms is evident in the participation rates in college teachers: The table showed that the majority (80%) of teachers from professional colleges participated in educational online programs or live telecast lectures at their institutions. The remaining 20% did not. Similarly, it was found that the majority (83%) of teachers from general degree colleges attended educational online programs or live telecast lectures in their institutions, while 12% did not. Thus, it can be concluded that the majority (82%) of all college teachers in Mizoram participated in educational online programs or live lectures at their institutions. In contrast, 18% of the teachers did not.

The web-based facilities available in an institution often reflect its overall standard. As shown in Table 4.12, among professional colleges: 28% of teachers rated their institution's web-based facilities as 'adequate', while 36% found them 'inadequate', and another 36% considered them 'moderate'. In general degree colleges: 25% of teachers rated their web-based facilities as 'adequate', 21% as 'inadequate', and the majority (54%) rated them as 'moderate'. Overall, it can be concluded that the majority (50%) of all college teachers rated the web-based facilities in their institutions as 'moderate'. Additionally, 26% considered them 'adequate', and 24% found them 'inadequate'.

Table 4.12 highlighted the problems faced by teachers in Mizoram's professional colleges during online classes. Forty-four percent of the teachers reported difficulties in motivating students, while 40% had trouble tracking students' work or assignments. A smaller percentage, 8%, lacked computer literacy skills. A significant majority (88%) of the teachers experienced network or internet connection failures during online classes. Additionally, 16% faced problems handling online interfaces, and 20% encountered setbacks in time management. It was also observed from Table 4.12 that teachers from general degree colleges faced similar issues during online classes. Forty-four percent of these teachers struggled with motivating students, and 28% had trouble tracking students' work or assignments. Sixteen percent lacked computer literacy skills, and the majority (88%) encountered network or internet connection failures. Furthermore, 29% had problems handling online interfaces, and 18% experienced setbacks in time management.

Overall, Table 4.12 demonstrated that 41% of all college teachers in Mizoram had problems motivating students. Thirty-one percent struggled with tracking students' work or assignments, and 14% lacked computer literacy skills. The most prevalent issue, affecting the majority (88%) of teachers, was network or internet connection failures during online classes. Twenty-six percent of the teachers faced problems handling online interfaces, and 19% had difficulty with time management.

Table 4.12 showed that the majority (72%) of teachers from professional colleges preferred to receive assignments in hardcopy, while 28% opted for softcopy. It also stated that the majority (67%) of teachers from general degree colleges favoured receiving assignments in hardcopy from their students, with 34% preferring softcopy. Thus, it could be concluded that the majority (67%) of all college teachers in Mizoram preferred to receive their students' assignments in hardcopy, whereas 33% wanted to receive them in softcopy.

Table 4.12 showed that the majority (64%) of teachers from professional colleges in Mizoram took online classes 'a few times in a week' during the COVID-19 pandemic. In contrast, 28% of teachers took online classes 'every day', and the remaining 8% did so "occasionally." The table also highlighted that the majority (65%) of teachers from general degree colleges in Mizoram took online classes 'a few times in a week' during the COVID-19 pandemic. Additionally, 27% took online classes 'every day', 7% did so 'occasionally', and only 2% took online classes 'very rarely'. As a result, the majority (65%) of all college teachers in Mizoram took online classes 'a few times a week' during the COVID-19 pandemic. 26% of teachers took online classes 'every day', 7% did so 'occasionally', and a mere 2% took online classes 'very rarely'.

Taking classes during the COVID-19 pandemic presented significant challenges, as many factors impacted teachers' ability to teach effectively (Table 4.12, Sl. No. 22). Despite these difficulties, Table 4.12 also reflected the satisfaction levels of teachers regarding their online classes during this period. Specifically, 8% of teachers from professional colleges were 'very satisfied' with their online classes, 36% were 'satisfied', 40% were 'slightly satisfied', and 16% were 'dissatisfied'.

Among teachers from general degree colleges, 6% were 'very satisfied' with their online classes. The majority (50%) were 'satisfied', 35% were 'slightly satisfied', and 9% were 'dissatisfied'. It was surprising to observe that the majority (47%) of teachers from both college types were 'satisfied' with their online classes during the pandemic, even though this percentage was not exceptionally high. Overall, 7% of teachers were 'very satisfied', 36% were 'slightly satisfied', and 10% of college teachers in Mizoram were 'dissatisfied' with taking online classes during the COVID-19 pandemic.

Table 4.12 also reflected the satisfaction levels of teachers regarding the courses or syllabi covered during the COVID-19 pandemic. The majority (64%) of teachers from professional colleges were 'very satisfied' with covering their course or syllabus during the pandemic. Another 28% were 'satisfied', 4% were 'slightly satisfied', and 4% were 'dissatisfied'. The table also revealed that the majority (66%) of teachers from general degree colleges were 'very satisfied' with covering their course or syllabus during the pandemic. Twenty-four percent were 'satisfied', 7% were 'slightly satisfied', and 2% were 'dissatisfied'. From the total responses, it could be said that the majority (66%) of teachers from both colleges were 'very satisfied' with covering their course or syllabus during the COVID-19 pandemic. Twenty-five percent of teachers were 'satisfied', 6% were 'slightly satisfied', and only 3% were 'dissatisfied' regarding the course or syllabus covered during the COVID-19 pandemic.

4.3.2 Web-based Learning Resources being accessed by the Students of Professional Colleges and General Degree Colleges in Mizoram

Table 4.13

Web-based Learning Resources being accessed by the Students of Professional and General Degree Colleges in Mizoram (Item 1 – 6)

Items / Statements	Label	Responses		
		Professional 278	General 1625	Total 1903
1. Own a Computer or Laptop	Yes	215 (77%)	765 (47%)	976 (51%)
	No	63 (23%)	860 (53%)	919 (49%)
2. Use a Computer or Laptop for	1 - 5 years	124 (45%)	949 (58%)	1073 (56%)
	6 – 10 years	66 (24%)	272 (17%)	338 (18%)
	More than 10 years	88 (31%)	404 (22%)	492 (26%)
3. Used Smartphone for	Less than a year	17 (6%)	217 (13%)	234 (12%)
	1 – 5 years	88 (32%)	634 (39%)	722 (38%)
	More than 5 years	173 (62%)	774 (48%)	947 (50%)
4. Used the Internet for	Recreational or Entertainment	208 (75%)	764 (47%)	972 (51%)
	Educational purpose	221 (80%)	956 (59%)	1177 (62%)
	Updating knowledge	218 (78%)	1203 (74%)	1421 (75%)
	Seeking job	104 (37%)	411 (25%)	515 (27%)
5. Accessed the Internet	Very rarely	6 (2%)	96 (6%)	102 (5%)
	Occasionally	15 (5%)	173 (11%)	188 (10%)
	A few times a week	9 (3%)	189 (12%)	198 (11%)
	Everyday	248 (89%)	1167 (71%)	1415 (74%)

6. Access to the network from the institution	No	170 (61%)	1060 (65%)	1230 (65%)
	Yes	108 (39%)	565 (35%)	673 (35%)

Table 4.13 showed that the majority (77%) of the students from professional colleges had their own computers or laptops, and 23% of the students did not own a computer or laptop. Among the general degree colleges, the majority (53%) of students did not have a computer or laptop, while 47% of students had their own computer or laptop. Generally, the majority (51%) of the college students in Mizoram had a computer or laptop, and 49% of college students did not have a computer or laptop of their own.

It could be seen from Table 4.13 that the majority (45%) of students from professional colleges used computers or laptops in the last 1–5 years; 24% of them used them in the previous 6–10 years; and 31% used them for more than 10 years. In the meantime, the majority (58%) of students from the general degree colleges used computers or laptops in the last 1–5 years; 27% of them used computers or laptops for the last 6–10 years, and 22% of students were using computers or laptops for more than 10 years. However, it can be stated that the majority (56%) of the college students from professional and general degree colleges used computers or laptops for the last 1-5 years; 18% of them used them from the last 6-10 years, and 26% of the college students in Mizoram used computer or laptop for more than 10 years.

As shown in Table 4.13, among the professional colleges, the majority (62%) of students used smartphones for more than 5 years; 32% of them used them for the last 1-5 years, and 6% of students used smartphones for less than a year. In the meantime, the majority (48%) of students in the general degree colleges used them for more than 5 years; 13% of students used smartphones for less than a year; 39% of students used smartphones from the last 1-5 years; and. In total, the majority (50%) of the students from professional and general degree colleges used smartphones for more than 5 years; 12% of the students used smartphones for less than a year; and 38% of the college students used smartphones for the last 1-5 years.

From Table 4.13, it could be seen that among professional colleges, 75% of students used the internet for recreational or entertainment purposes; 80% of them used the internet for educational purposes; 78% of students used the internet to update their knowledge, and 37% of students used the internet to seek jobs. A total of 47% of students from general degree colleges used the internet for recreational or entertainment purposes; 59% of them used the internet for educational purposes; 74% of them used the internet to update their knowledge, and 25% of students used the internet to seek jobs. The table also revealed that 51% of college students used the internet for recreational or entertainment purposes, 62% of students used the internet for educational purposes, 75% of them used the internet to update their knowledge, and 27% of the college students in Mizoram used the internet to seek a job.

It was clear from Table 4.13 that among professional colleges, the majority (89%) of the respondents accessed the internet 'every day', 5% of students accessed the internet 'occasionally', 3% of the students accessed the internet 'a few times a week', and only 2% of students accessed the internet 'very rarely'. At the same time, the majority (71%) of the students from general degree colleges accessed the internet 'every day'; 6% of students accessed the internet 'very rarely', 11% of students accessed the internet 'occasionally', and 10% of them accessed the internet 'a few times in a week'. In general, the majority (74%) of the responses from professional and general degree colleges in Mizoram accessed the internet 'every day', 11% of them accessed the internet 'a few times in a week', 10% of them accessed the internet occasionally, and only 5% of college students accessed the internet 'very rarely'.

Table 4.13 revealed that the majority (61%) of students from professional colleges did not access a network from their institution, and 39% of students did. Among the students at general degree colleges, the majority (65%) of students accessed the internet from institutions, and 35% of students accessed networks from the institution. However, the majority (65%) of college students did not access the network from their institution, and 35% of the college students in Mizoram accessed the network from their institution.

Table 4.14

**Web-based Learning Resources being accessed by the Students of Professional
and General Degree Colleges in Mizoram (Item 7-10)**

Items / Statements	Label	Responses		
		<i>Professional</i> 278	<i>General</i> 1625	<i>Total</i> 1903
7. Social Media Platform	Instagram	233 (84%)	1013 (62%)	1246 (65%)
	Facebook	178 (64%)	733 (45%)	911 (48%)
	WhatsApp	270 (97%)	1480 (91%)	1750 (92%)
	YouTube	258 (93%)	1190 (73%)	1448 (76%)
	Twitter	113 (40%)	389 (23%)	502 (26%)
	Telegram	149 (53%)	588 (36%)	737 (39%)
8. Websites and Academic Platforms	LinkedIn	21 (8%)	37 (2%)	58 (3%)
	Wikipedia	143 (51%)	431 (27%)	574 (30%)
	Academia.edu	36 (13%)	28 (2%)	64 (3%)
	ResearchGate	44 (16%)	20 (1.2%)	64 (3%)
9. Apps for Online interaction (academic)	Google Classroom	135 (49%)	733 (45%)	868 (46%)
	WebEx	15 (4%)	158 (10%)	173 (9%)
	Zoom	180 (65%)	1070 (66%)	1250 (66%)
	Google Meet	209 (75%)	1037 (64%)	1246 (65%)
10. Online Personal Space other than Social Networking Sites	Yes	26 (9%)	398 (24%)	424 (22%)
	No	252 (91%)	1227 (76%)	1479 (78%)

Table 4.14 showed the different types of social media platforms used by professional college students, among which WhatsApp was the most used (97%) social media app for online academic interaction, followed by YouTube (93%),

Instagram (84%), Facebook (64%), Telegram (53%) and Twitter (40%). In the meantime, WhatsApp was also the most used (91%) social media platform by general college students for online educational purposes. Other social media platforms used by the students of general degree colleges were YouTube (73%), Instagram (62%), Facebook (45%), Telegram (36%), and Twitter (23%). Based on the above observations, it could be concluded that WhatsApp was the most used (92%) social media platform for online academic interaction by college students in Mizoram; they also used YouTube (76%), Instagram (65%), Facebook (48%), Twitter (26%) and Telegram (39%).

Table 4.14 also revealed the educational websites that students frequently used. The table showed that Wikipedia was the most (51%) visited website by professional college students for academic purposes; they also visited ResearchGate (16%), Academia.edu (13%) and LinkedIn (8%). Among the general degree college students, Wikipedia were also the most (27%) visited website for educational purposes; they also used websites such as LinkedIn (2%), Academia.edu (2%) and ResearchGate (1.2%). Thus, it could be said that Wikipedia was the most (30%) visited website, and LinkedIn (3%), Academia.edu (3%), and ResearchGate (3%) were other visited websites by college students in Mizoram for educational purposes.

It could be seen from Table 4.14 that Google Meet was the most (75%) used app for online interaction by professional college students during the COVID-19 pandemic, followed by Zoom (65%), Google Classroom (49%) and WebEx (4%). The table also reveals that Zoom was the most (66%) used app for online interaction by general college students during the COVID-19 pandemic, followed by Google Meet (64%), Google Classroom (45%) and WebEx (10%). Among the college students in Mizoram, Zoom (66%) was the most used app for online interaction during the COVID-19 pandemic, followed by Google Meet (65%), Google Classroom (46%) and WebEx (9%).

Table 4.14 also showed that the majority (91%) of the students in professional colleges did not have any online personal space, and 9% of students owned online personal space other than social networking sites, e.g. blogs. On the

other hand, the majority (76%) of students from the general degree colleges in Mizoram did not have any online personal space, and 24% of students had online personal space other than a social networking site. However, from the total responses, it could be seen that the majority (78%) of college students in Mizoram did not have any online personal space, and 22% of the college students in Mizoram had an online personal space other than a social networking site, i.e. blogs.

Table 4.15

Web-based Learning Resources being accessed by the Students of Professional and General Degree Colleges in Mizoram (Item 11-16)

Items / Statements	Label	Responses		
		Professional 278	General 1625	Total 1903
11. Used Search Engines	Google	277 (99.6%)	1602 (99%)	1872 (99%)
	Yahoo	10 (4%)	29 (2%)	39 (2%)
	UC Browser	74 (27%)	383 (24%)	457 (24%)
12. Awareness of Online Sources	Family	78 (28%)	546 (34%)	624 (33%)
	Institution initiatives	130 (47%)	782 (48%)	912 (48%)
	Media	185 (76%)	981 (60%)	1166 (61%)
	Friends	960 (59%)	158 (57%)	1118 (58%)
13. Organizing Orientation Programme on Web-based or ICT	Yes	186 (67%)	1221 (75%)	1407 (74%)
	No	92 (33%)	404 (25%)	496 (26%)
14. Computer basic knowledge	Excellent	22 (8%)	76 (5%)	98 (5%)
	Good	64 (23%)	371 (23%)	435 (23%)
	Average	154 (55%)	711 (44%)	865 (46%)
	Poor	38 (14%)	467 (29%)	505 (27%)

15. Ability to handle Web-based facility or ICT in Teaching-Learning	High	20 (7%)	85 (5%)	105 (6%)
	Medium	186 (67%)	1255 (77%)	1441 (76%)
	Low	72 (26%)	285 (18%)	357 (18%)
16. Preference type of Learning	Conventional / Traditional	118 (43%)	989 (61%)	1107 (58%)
	Modern / Contemporary (Use of ICT or Web-based)	160 (57%)	636 (39%)	796 (42%)

The above table (Table 4.15) showed that the majority (99.6%) of the students from the professional colleges used Google search engines for exploring information and knowledge; 27% of them used UC Browser, and only 4% of them used Yahoo. The majority (99%) of the students from general degree colleges used Google search, 2% of students used Yahoo, and 24% of students used UC Browser. From the total responses, it could be found that the majority (99%) of the students from professional and general degree colleges used Google search engines; 24% of college students used the UC Browser, and only 2% of students used Yahoo.

As shown in Table 4.15, among the professional colleges, the majority (76%) of the students came to know online sources from various media outlets; 57% of students from their friends; 47% of students came to know online sources from the initiatives taken by the institutions, that was, an orientation programme on the use of web-based tools; and 28% of students came to know online sources from their families. Among the students from general degree colleges, the majority (60%) of the students came to know from the media; 51% of students came to know online sources through their friends; 48% of students from the institution, and 34% of students from their families. Out of total respondents, the majority (61%) of college students in Mizoram came to know online sources from the media means; 59% from their

friends; 48% through the institution, and 33% of college students got information about online sources from their families.

Table 4.15 showed that the majority (67%) of the students from professional colleges responded that their institutions organized an orientation programme on web-based or ICT, and 33% of them responded that their institutions did not organize any of orientation programme on web-based or ICT. The above table (Table 4.15) also showed that the majority (75%) of the students from general degree colleges responded that their institutions organized an orientation programme on web-based or ICT, and 25% of students responded that their institutions did not organize an orientation programme on web-based or ICT. In general, the majority (74%) of students responded that their institutions organized an orientation programme on web-based or ICT, and 26% of the college students in Mizoram responded that their institutions did not organize an orientation programme on web-based or ICT usage in the teaching-learning process.

From Table 4.15, it could be seen that the majority (55%) of the students in professional colleges had an 'average' ability of using computer; 23% of students had 'good' ability; 14% of students had poor ability, and 8% of students responded had an 'excellent' ability of using computer. Table 4.15 also revealed that the majority (44%) of the students from general degree colleges had 'average' skills; 29% of them had poor skills; 23% of students had 'good' skills, and 5% of them had 'excellent' skills of using computer. From the overall responses, it could be seen that the majority (46%) of college students in Mizoram had 'average' skills, 27% of college students had poor skills, 23% of students had 'good' skills, and 5% of students had 'excellent' skills of using the computer.

It could be seen from Table 4.15 that the majority (67%) of the students from professional colleges had 'medium' ability in handling web-based facilities or ICT in teaching-learning, 26% of students had 'low' ability, and 7% of students had 'high' ability. The table also showed that the majority (77%) of the students at general degree colleges had 'medium' ability in handling web-based facilities or ICT in teaching-learning; 18% of students had 'low' ability, and 5% of students had 'high'

ability. From the total responses, it could be seen that the majority (76%) of the college students in Mizoram had ‘medium’ ability to handle web-based facilities or ICT in teaching-learning; 18% of students had ‘low’ ability, and 6% of students had ‘high’ ability.

The above table also showed that the majority (57%) of students from professional colleges preferred a modern or contemporary (use of ICT or Web-based) type of learning, and 41% of students preferred a conventional type of learning. Table 4.15 also revealed that the majority (61%) of students in the general degree colleges preferred a traditional kind of learning, and 39% of students preferred a modern or contemporary type of learning. In total, the majority (58%) of the college students in Mizoram preferred a conventional kind of learning, and 42% of students preferred modern or contemporary teaching and learning.

Table 4.16

Web-based Learning Resources being accessed by the Students of Professional and General Degree Colleges in Mizoram (Item 17)

17. Application software familiar with and used				
<i>Label</i>	<i>(How often do you use it?)</i>	<i>Professional – 278</i>	<i>General- 1625</i>	<i>Total - 1903</i>
MS Office	Always	112 (40%)	290 (18%)	402 (21%)
	Sometimes	146 (53%)	823 (51%)	969 (51%)
	Never	20 (7%)	512 (31%)	532 (28%)
Media Player	Always	59 (21%)	187 (12%)	246 (13%)
	Sometimes	131 (47%)	650 (40 %)	781 (41%)
	Never	88 (32%)	788 (48%)	876(46%)
Accounting Software	Always	11 (4%)	72 (4%)	83 (4%)
	Sometimes	65 (23%)	485 (30%)	550 (29%)
	Never	202 (73%)	1068 (66%)	1270 (67%)
	Always	141 (51%)	679 (42%)	820 (43%)

Web conferencing	Sometimes	108 (39%)	798 (49%)	906 (48%)
	Never	29 (10%)	148 (9%)	177 (9%)
Anti-virus	Always	63 (23%)	199 (12%)	262 (14%)
	Sometimes	94 (34%)	575 (35%)	669 (35%)
	Never	121 (44%)	851 (53%)	972 (51%)
Graphic Designing	Always	4 (1%)	61 (4%)	65 (3%)
	Sometimes	28 (10%)	341 (21%)	369 (20%)
	Never	246 (89%)	1223 (75%)	1469 (77%)
Digital Audio Work Station	Always	12 (4%)	102 (6%)	114 (6%)
	Sometimes	31 (11%)	441 (27%)	472 (25%)
	Never	235 (85%)	1082 (67%)	1317(69%)

The above table (Table 4.16) showed that the majority (53%) of students from professional colleges ‘sometimes’ used MS Office; 40% of students ‘always’ used MS Office, and only 6% of them ‘never’ used it. The given table also showed that the majority (51%) of students from general degree colleges ‘sometimes’ used MS Office, 18% of students ‘always’ used MS Office, and 31% of students ‘never’ used MS Office. It could be seen from the table that the majority (51%) of the college students in Mizoram ‘sometimes’ used MS Office; 21% of students ‘always’ used MS Office and 28% of students ‘never’ used MS Office.

The majority (47%) of students from professional colleges ‘sometimes’ used media players; 32% of students ‘never’ used media players, and it was also ‘always’ used by 21% of students. The table revealed that the majority (48%) of students ‘never’ used media players, 40% of them ‘sometimes’ used media players, and 12% of students ‘always’ used media players. Thus, it could be concluded that the majority (46%) of the college students in Mizoram ‘never’ used the media players; 41% of them ‘sometimes’ used media players; and 13% of the students ‘always’ media players.

It was clear that the majority (73%) of the students in professional colleges ‘never’ used accounting software; 23% of them ‘sometimes’ used accounting

software, and 4% of students ‘always’ used accounting software. On the other hand, the majority (66%) of the students from the general degree colleges ‘never’ used accounting software, 30% of them ‘sometimes’ used accounting software, and 4% of students ‘always’ used accounting software. Thus, it could be said that the majority (67%) of the college students in Mizoram ‘never’ used accounting software; 29% of them ‘sometimes’ used it, and only 4% of them ‘always’ used the accounting software.

The majority (51%) of students from professional colleges ‘always’ used Web conferencing; 39% of students ‘sometimes’ used Web conferencing, and it was ‘never’ used by 10% of students. Meanwhile, 49% of students from the general degree colleges ‘sometimes’ used web conferencing, 42% of students ‘always’ used it and only 9% of students ‘never’ used web conferencing. However, among the college students in Mizoram, 48% of them ‘sometimes’ used web conferencing, 43% of them ‘always’ used it, and only 9% ‘never’ used web conferencing.

It was evident from Table 4.16 that 23% of students ‘always’ used anti-virus, 34% of students ‘sometimes’ used anti-virus, and the majority (44%) of students ‘never’ used anti-virus. The table also revealed that 12% of students ‘always’ used anti-virus, 35% of students ‘sometimes’ used anti-virus, and the majority (53%) of students ‘never’ used anti-virus. Therefore, it was clear that 14% of the college students ‘always’ used anti-virus, 35% of them ‘sometimes’ used it, and the majority (51%) of college students in Mizoram ‘never’ used anti-virus.

Regarding the use of graphic design software, only 1% of students from professional colleges said that they ‘always’ used it; 10% of students ‘sometimes’ used it, and the majority (89%) of the students ‘never’ used graphic design software. Only 4% of students from the general degree colleges ‘always’ used graphic design; 21% of students ‘sometimes’ used it, and the majority (75%) of the students from the general degree colleges ‘never’ used graphic design. However, only 3% of the college students ‘always’ used graphic designing software, 20% of them ‘sometimes’ used it and the majority (77%) of students in Mizoram ‘never’ used graphic design software.

Table 4.16 displayed that only 4% of students ‘always’ used digital audio workstations; 11% of students ‘sometimes’ used digital audio workstations; and the majority (85%) of the students from professional colleges ‘never’ used digital audio workstations. In the meantime, among the general degree colleges, only 6% of students ‘always’ used digital audio workstations; 27% of students ‘sometimes’ used digital audio workstations; and the majority (67%) of students from general degree colleges ‘never’ used digital audio workstations. Therefore, it was clear that only 6% of college students in Mizoram ‘always’ used digital audio workstations, 25% of them ‘sometimes’ used it and the majority (69%) of college students from professional and general degree colleges in Mizoram ‘never’ used digital audio workstations.

Table 4.17

Web-based Learning Resources being accessed by the Students of Professional and General Degree Colleges in Mizoram (Item 18)

18. Application software familiar with and used				
<i>Label</i>	<i>Label your proficiency</i>	<i>Responses Professional – 278</i>	<i>Responses General-1625</i>	<i>Total - 1903</i>
MS Office	Excellent	62 (22%)	230 (14%)	292 (15%)
	Good	168 (61%)	892 (55%)	1060 (56%)
	Poor	48 (17%)	503 (31%)	551 (29%)
Media Player	Excellent	109 (39%)	147 (9%)	256 (13%)
	Good	111 (40%)	691 (43 %)	802 (42%)
	Poor	58 (21%)	787 (48%)	845(45%)
Accounting Software	Excellent	7 (2%)	52 (3%)	59 (3%)
	Good	41 (15%)	375 (23%)	416 (22%)
	Poor	230 (83%)	1198 (74%)	1428 (75%)
Web conferencing	Excellent	163 (59%)	679 (42%)	820 (43%)
	Good	97 (35%)	798 (49%)	906 (48%)
	Poor	18 (6%)	148 (9%)	177 (9%)
	Very regularly	63 (23%)	176 (11%)	239 (13%)

Anti-virus	Regularly	94 (34%)	793 (49%)	887 (47%)
	Not regularly	121 (44%)	656 (40%)	777 (40%)
Graphic Designing	Excellent	4 (1%)	17 (1%)	21 (1%)
	Good	82 (29%)	50 (3%)	132 (7%)
	Poor	192 (70%)	1558 (96%)	1750 (92%)
Digital Audio Workstation	Excellent	7 (2%)	46 (3%)	53 (3%)
	Good	36 (13%)	168 (10%)	204 (11%)
	Poor	235 (85%)	1411 (87%)	1646 (86%)

Table 4.17 explained how proficient the learners were in the following application software. The given table showed that 22% of students from professional colleges were ‘excellent’ in using MS Office; the majority (61%) of them were ‘good’; and 17% of students were ‘poor’. The table also explained that 14% of students from the general degree colleges had ‘excellent’ proficiency in using MS Office; the majority (55%) of students had ‘good’ proficiency; and 31% of students had ‘poor’ proficiency in using MS Office. It was evident that the majority (56%) of the college students in Mizoram were ‘good’ in using MS Office; 15% of students were ‘excellent’, and 29% of students were ‘poor’ in using MS Office.

The above table (Table 4.17) signified that among the professional college students in Mizoram, 39% of the respondents were ‘excellent’ in using media players; the majority (40%) of students were ‘good’ in using media players; and 21% of students were ‘poor’ in using media players. Among the general degree colleges, only 9% of students were ‘excellent’ in using media players; 43% of the students had ‘good’ proficiency in using media players; and the majority (48%) of students had ‘poor’ ability in using media players. Table 4.17 clearly stated that 13% of the college students in Mizoram had ‘excellent’ proficiency in using media players, 42% of students had ‘good’ proficiency, and the majority (45%) of them had ‘poor’ proficiency in using media players.

It could be seen from Table 4.17 that only 2% of students from the professional colleges were ‘excellent’, 15% of students were ‘good’, and the majority

(83%) of students were 'poor' in using accounting software. Table 4.17 also described that 3% of students from general degree colleges had 'excellent' proficiency in accounting software, 23% of them had a 'good' proficiency in using accounting software, and the majority (74%) of students had 'poor' proficiency in using accounting software. Out of all the students, only 3% of the college students had 'excellent' proficiency in using accounting software; 22% of the college students had 'good' proficiency in using accounting software, and the majority (75%) of the college students in Mizoram had 'poor' proficiency in using accounting software.

From the students of professional colleges, only 6% of students assumed that they had 'excellent' proficiency in using web conferencing; 35% had 'good' proficiency; and the majority (59%) had 'poor' proficiency in using web conferencing. It was also evident that among general degree colleges, 9% of students were 'excellent' in using web conferencing, 49% were 'good' in using Web conferencing, while 42% of students were 'poor' in using web conferencing. However, 9% of the college students had 'excellent' proficiency in using web conferencing, the majority (48%) of the college students had 'good' proficiency in using web conferencing, and 43% of the college students in Mizoram had 'poor' proficiency in using web conferencing.

Among the professional college students, 23% of them used antivirus 'very regularly'; 34% of students had used 'regularly', and the majority (44%) of them used antivirus 'not regularly'. Only 11% of students from the general degree colleges used antivirus 'very regularly'; the majority (49%) of students used 'regularly', and 40% used anti-virus 'not regularly'. Thus, it could be said that 13% of the college students used antivirus 'very regularly'; the majority (47%) used 'regularly', and 40% of the college students in Mizoram used antivirus 'not regularly'.

Among the professional college students, only 1% of the respondents had 'excellent' proficiency in using graphic design software; 29% had 'good' proficiency in using graphic design, and the majority (70%) of students had 'poor' proficiency in using graphic design software. Among the general degree colleges, only 1% of students had 'excellent' proficiency in using graphic design; 3% had 'good'

proficiency in using graphic design; and the majority (96%) had ‘poor’ proficiency in using graphic design. Therefore, it could be concluded that only 1% of college students had ‘excellent’ proficiency in using graphic design software, 7% of students had ‘good’ proficiency, and the majority (92%) had ‘poor’ proficiency in using graphic design software.

Only 2% of the respondents from the professional colleges had ‘excellent’ proficiency in using digital audio workstations; 13% of them had ‘good’ proficiency; and the majority (85%) of the students had ‘poor’ proficiency in using digital audio workstations. Among the general degree colleges, only 3% of students had ‘excellent’ proficiency in using digital audio workstations; 10% of students had ‘good’ proficiency in using digital audio workstations; and the majority (87%) of students had ‘poor’ proficiency in using digital audio workstations. Thus, Table 4.17 signified that only 3% of the college students had ‘excellent’ proficiency in using digital audio workstations, 11% had ‘good’ proficiency, and the majority (86%) had ‘poor’ proficiency in digital audio workstations.

Table 4.18

Web-based Learning Resources being accessed by the Students of Professional and General Degree Colleges in Mizoram (Item 19)

19. System software familiar with and used				
<i>Label</i>	<i>(How often do you use it?)</i>	<i>Responses Professional – 278</i>	<i>Responses General- 1625</i>	<i>Total - 1903</i>
Windows	Always	166 (60%)	527 (33%)	693 (36%)
	Sometimes	92 (33%)	718 (44%)	810 (43%)
	Never	20 (7%)	380 (23%)	400 (21%)
Linux	Always	6 (2%)	68 (4%)	74 (4%)
	Sometimes	28 (10%)	318 (20%)	346 (18%)
	Never	244 (88%)	1239 (76%)	1483 (78%)
	Always	48 (17%)	228 (14%)	276 (15%)

iOS	Sometimes	51 (18%)	481 (30%)	532 (28%)
	Never	179 (65%)	916 (56%)	1095 (57%)
Android	Always	217 (78%)	1036 (64%)	1253 (66%)
	Sometimes	45 (16%)	446 (27%)	491 (26%)
	Never	16 (6%)	143 (9%)	159 (8%)
Macintosh	Always	6 (2%)	69 (4%)	75 (4%)
	Sometimes	15 (5%)	281 (17%)	296 (16%)
	Never	257 (93%)	1275 (79%)	1532 (80%)

Table 4.18 highlighted that the majority (60%) of students from professional colleges ‘always’ used Windows, 33% of students ‘sometimes’ used Windows, and 7% of students ‘never’ used Windows. Table 4.18 also revealed that 33% of students from general degree colleges ‘always’ used Windows, the majority (44%) of students ‘sometimes’ used Windows and 23% of students ‘never’ used Windows. Among the college students, 36% of them ‘always’ used Windows, the majority (43%) of them ‘sometimes’ used Windows, and 21% of them ‘never’ used Windows.

Table 4.18 showed that Linux was ‘always’ used by 2% of students from professional colleges, 10% of students ‘sometimes’ used Linux and the majority (88%) of students ‘never’ used Linux. It also displayed that among the general degree colleges, Linux was ‘always’ used by 4% of students, 20% of students ‘sometimes’ used Linux, and the majority (76%) of students ‘never’ used Linux. However, 4% of the college students ‘always’ used Linux, 18% ‘sometimes’ used Linux and the majority (78%) of the college students in Mizoram ‘never’ used Linux.

The table showed that 17% of students ‘always’ used iOS, 18% of students ‘sometimes’ used iOS, and the majority (65%) of students ‘never’ used iOS. Among the students from general degree colleges, 14% of them ‘always’ used iOS; 30% of students ‘sometimes’ used iOS; and the majority (56%) of students ‘never’ used iOS. The table also signified that 15% of the college students ‘always’ used iOS, 28% of them ‘sometimes’ used iOS, and the majority (57%) of the college students in Mizoram ‘never’ used iOS.

The majority (78%) of the students from professional colleges ‘always’ used Android, 16% of students ‘sometimes’ used Android, and 6% of students ‘never’ used Android. Among the general degree colleges in Mizoram, the majority (64%) of students ‘always’ used Android, 27% of them ‘sometimes’ used Android, and 9% of students ‘never’ used Android. It could be stated that the majority (66%) of the college students ‘always’ used Android, 26% of them ‘sometimes’ used Android, and only 8% of the college students in Mizoram ‘never’ used Android.

It was clear from Table 4.18 that 2% of students from the professional colleges ‘always’ used Macintosh, (5%) of them ‘sometimes’ used Macintosh, and the majority (93%) of the students ‘never’ used Macintosh. The table also showed that 4% of students ‘always’ used Macintosh, 17% of students ‘sometimes’ used Macintosh and the majority (79%) of the students ‘never’ used Macintosh. Among the college students in Mizoram, only 4% of them ‘always’ used Macintosh, 16% of them ‘sometimes’ used Macintosh, and the majority (80%) of the students from professional and general degree colleges ‘never’ used Macintosh.

Looking at Table 4.18, it could be concluded that among the system software, Android was the most used system software by college students; other than that, Windows was also ‘sometimes’ used by them. Students were unfamiliar with other system software that could be helpful for their educational purposes.

Table 4.19

**Web-based Learning Resources being accessed by the Students of Professional
and General Degree Colleges in Mizoram (Item 20)**

20. System software familiar with and used				
<i>Label</i>	<i>Label your proficiency</i>	<i>Responses Professional – 278</i>	<i>Responses General-1625</i>	<i>Total - 1903</i>
Windows	Excellent	76 (27%)	137 (8%)	213 (11%)
	Good	152 (55%)	781 (48%)	933 (49%)
	Poor	50 (18%)	707 (44%)	757 (40%)
Linux	Excellent	4 (1%)	53 (3%)	57 (3%)
	Good	36 (13%)	328 (20%)	364 (19%)
	Poor	238 (86%)	1244 (77%)	1482 (78%)
iOS	Excellent	48 (17%)	208 (13%)	256 (13%)
	Good	62 (22%)	501 (31%)	563 (30%)
	Poor	168 (61%)	916 (56%)	1084 (57%)
Android	Excellent	209 (75%)	987 (61%)	1196 (63%)
	Good	64 (23%)	495 (30%)	559 (29%)
	Poor	5 (2%)	143 (9%)	148 (8%)
Macintosh	Excellent	6 (2%)	59 (4%)	65 (3%)
	Good	15 (5%)	291 (18%)	306 (16%)
	Poor	257 (93%)	1275 (78%)	1532 (81%)

From the above table (Table 4.19), it could be seen that 27% of students in professional colleges had ‘excellent’ proficiency in using Windows; the majority (55%) of students had ‘good’ proficiency; and 18% of students had ‘poor’ proficiency in using Windows. It was also clear from Table 4.19 that only 8% of students from the general degree colleges had ‘excellent’ proficiency in using Windows; the majority (48%) of students had ‘good’ proficiency and 44% of students had ‘poor’ proficiency in using Windows. The table also signified that 11% of the college students had ‘excellent’ in using Windows; the majority (49%) of them

had 'good' proficiency and 40% of the college students in Mizoram had 'poor' proficiency.

It could also be seen that only 1% of students from professional colleges had 'excellent' proficiency in using Linux; 13% of them had 'good' ability in using Linux, and the majority (86%) of students were 'poor' in handling Linux. It could also be found that only 3% of students among the general degree colleges had 'excellent' proficiency in using Linux; 20% of students were 'good' in using Linux, and the majority (77%) of students were 'poor' in handling Linux. Therefore, 3% of the college students had 'excellent' proficiency in using Linux, 19% of them had 'good' proficiency, and the majority (78%) of the college students in Mizoram had 'poor' proficiency in using Linux.

It was also evident that 17% of students had 'excellent' proficiency in using iOS, 22% of students had 'good' proficiency in using iOS, and the majority (61%) of students had 'poor' proficiency in using iOS. Among the general degree colleges, 13% of students had 'excellent' proficiency in using iOS, 31% of students had 'good' proficiency in using iOS, and the majority (56%) of students had 'poor' proficiency in using iOS. Thus, 13% of the college students in Mizoram had 'excellent' proficiency in using iOS, 30% had 'good' proficiency, and the majority (57%) of college students in Mizoram had 'poor' proficiency in using iOS.

The majority (75%) of students had 'excellent' proficiency in using Android; 23% of students had 'good' proficiency, and only 2% of students had 'poor' proficiency in using Android. Among the general degree colleges, the majority (61%) of students had 'excellent' proficiency in using Android, 30% of students had 'good' proficiency, and 9% of students had 'poor' proficiency in using Android. The table clearly states that the majority (63%) of college students in Mizoram had 'excellent' proficiency in using Android, 29% had 'good' proficiency, and 8% of college students in Mizoram had 'poor' proficiency in using Android.

Table 4.19 signified that 2% of students from the professional college had 'excellent' proficiency in using Macintosh, 5% of students had 'good' proficiency, and the majority (93%) of students had 'poor' proficiency in using Macintosh.

Among the general degree colleges, 4% of students had ‘excellent’ proficiency in using Macintosh, 18% of students had proficiency, and the majority (78%) of students had ‘poor’ proficiency in utilizing Macintosh. Thus, only 3% of college students had ‘excellent’ proficiency in using Macintosh; 16% had ‘good’ proficiency, and the majority (81%) of the college students in Mizoram had ‘poor’ proficiency in using Macintosh. Many system software may not have been well-liked by the college students in Mizoram due to their lack of user-friendliness, suitability for desktop use, lack of support for specific hardware, and high cost.

Table 4.20
Web-based Learning Resources being accessed by the Students of Professional and General Degree Colleges in Mizoram (Item 21-24)

Items / Statements	Label	Responses		
		Professional 278	General 1625	Total 1903
21. Attending Educational Online Programmes/Live Telecast Lectures on your Institution	Yes	206 (74%)	1493 (92%)	1699 (89%)
	No	72 (26%)	132 (8%)	204 (11%)
22. Rate the Web-based Facilities in your Institution.	Adequate	71 (26%)	457 (28%)	528 (28%)
	Inadequate	46 (16%)	87 (5%)	133 (7%)
	Moderate	161 (58%)	1081 (67%)	1242 (65%)
23. Problems faced during Online Classes	Lack of motivation	139 (50%)	579 (36%)	718 (38%)
	Tracking of work or assignment	59 (21%)	255 (16%)	319 (17%)
	Lack of computer literacy skills	32 (12%)	162 (10%)	194 (11%)
	Network or internet	199 (72%)	1199 (74%)	1398 (74%)

	connection failure			
	Problems in handling the online interface	61 (22%)	412 (25%)	473 (25%)
	Time management	71 (26%)	517 (32%)	588 (31%)
24. How do you like to submit your assignment?	Softcopy	153 (55%)	931 (57%)	1084 (57%)
	Hardcopy	125 (45%)	694 (43%)	819 (43%)

Table 4.20 revealed that the majority (74%) of students in professional colleges attended educational online programmes or live telecast lectures in their institutions, whereas 26% of students did not participate in educational online programmes or live lectures in their institutions. It was also found that the majority (92%) of the students from general degree colleges attended educational online programmes or live telecast lectures in their institutions. In comparison, only 8% of students did not participate in such programmes. Table 4.20 revealed that among the professional and general degree colleges in Mizoram, the majority (89%) of the students attended educational online programmes or live lectures in their institutions; in the meantime, the institutions did not organize specific educational online programmes or live online lectures could be the reason why 11% of the students did not attend online programmes.

It was clear from Table 4.20 that 26% of students from professional colleges rated the web-based facilities in their institutions as ‘adequate’, 16% of students rated the web-based facilities as ‘inadequate’, and the majority (58%) of students rated the web-based facilities as ‘moderate’. Meanwhile, in general degree colleges, 28% of students rated the web-based facilities in their institutions as ‘adequate’, 5% of students rated the web-based facilities as ‘inadequate’, and the majority (67%) of the students rated the web-based facilities as ‘moderate’. Therefore, it could be stated that 28% of students rated the web-based facilities in their institutions as ‘adequate’, only 7% of students rated it as ‘inadequate’, and the majority (65%) of the college

students from both colleges rated the web-based facilities in their institutions as ‘moderate’.

Table 4.20 highlighted specific issues faced by students from professional colleges during online classes, such as 72% of students faced network issues or internet connection failures during online courses, 50% of students reported a lack of motivation, 26% of students had problems with time management; 22% of students had problems handling online interfaces; 21% of students had trouble in tracking their work or assignments, and 12% of students lacked in computer literacy skills. Table 4.20 also revealed the problems faced during online classes by the students of general degree colleges, stating that the majority (74%) of students had network or internet connection failure during online classes; 36% of them lacked motivation from their teachers; 32% had set back in time management; 16% of students had problems in tracking their work or assignments; 25% of students had problems handling online interfaces, and 10% of students lacked in computer literacy skills. From Table 4.20, it could be seen that students from professional and general degree colleges that the majority (74%) of them had network or internet connection failures during online classes; 38% of them lacked motivation; 31% of students reported problems in time management; 25% of students had problems of handling online interfaces; 17% of them had trouble tracking their work or assignments, and 11% of students lacked computer literacy skills.

It could be seen from the given table that the majority (55%) of students from professional colleges liked to submit their assignments in softcopy, whereas 45% of students liked to submit the assignments in hardcopy. It also stated that the majority (57%) of students from general degree colleges liked to submit their assignments in softcopy, and 43% of students liked to submit in hardcopy. In conclusion, it could be said that the majority (57%) of the college students in Mizoram liked to submit their assignments in softcopy, and 43% of the college students in Mizoram liked to submit their assignments in softcopy.

Web-based learning provides a wide range of multimedia resources and allows students to access educational material at their own pace and at times that are

convenient for them. It is also affordable, eco-friendly, and saves time and money. This might be the reason why the majority (89%) of the students attended online educational programmes. In the meantime, they encountered several challenges, including lack of motivation, difficulties in tracking of work or assignment, insufficient computer literacy skills, issues with network or internet connectivity, problems in handling the online interfaces, and struggles with time management.

Table 4.21

Web-based Learning Resources being accessed by the Students of Professional and General Degree Colleges in Mizoram (Item 25-27)

Items / Statements	Label	Responses		
		Professional 278	General 1625	Total 1903
25. Online Class Attended during the COVID-19 Pandemic	Very rarely	5 (2%)	47 (3%)	52 (3%)
	Occasionally	31 (11%)	113 (7%)	144 (7%)
	A few times a week	69 (25%)	297 (18%)	366 (20%)
	Everyday	173 (62%)	1168 (72%)	1341 (70%)
26. Satisfaction with Classes Attended during the COVID-19 Pandemic	Very satisfied	27 (10%)	334 (20%)	361 (19%)
	Satisfied	103 (37%)	630 (39%)	733 (38%)
	Slightly satisfied	126 (45%)	518 (32%)	644 (34%)
	Dissatisfied	22 (8%)	143 (9%)	165 (9%)
27. Satisfaction with the Course or Syllabus covered during the COVID-19 Pandemic	Very satisfied	86 (31%)	445 (27%)	531 (28%)
	Satisfied	107 (38%)	651 (40%)	758 (40%)
	Slightly satisfied	61 (22%)	401 (25%)	462 (24%)
	Dissatisfied	24 (9%)	128 (8%)	152 (8%)

Above Table 4.21 showed that only 2% of students from professional colleges attended online classes ‘very rarely’ during the COVID-19 pandemic; 11%

of students attended ‘occasionally’; 25% of students attended online classes ‘a few times in a week’; and the majority (62%) of the students attended ‘every day’ during the COVID-19 pandemic. Table 4.21 also showed that 3% of students from general degree colleges attended online classes ‘very rarely’ during the COVID-19 pandemic; 7% of students attended ‘occasionally’; 18% of students attended ‘a few times in a week’, and the majority (72%) of the students attended online classes ‘every day’ during the COVID-19 pandemic. As shown in the above table, only 3% of college students attended online classes ‘very rarely’ during the COVID-19 pandemic; 7% of them attended ‘occasionally’; 20% of them attended ‘a few times in a week’, and the majority (70%) of the students from professional and general degree colleges attended online classes ‘every day’ during the COVID-19 pandemic.

Table 4.21 revealed that 10% of students from professional colleges were ‘very satisfied’ with online classes; 37% of students were ‘satisfied’; 45% of students were ‘slightly satisfied’; while 8% of students were ‘dissatisfied’ with online classes. It also revealed that 20% of students from general degree colleges were ‘very satisfied’ with online classes; 39% of students were ‘satisfied’; 32% of students were ‘slightly satisfied’; while 9% of students were ‘dissatisfied’ with online classes during the COVID-19 pandemic. From the above table (Table 4.21), it could be concluded that 19% of college students in Mizoram were ‘very satisfied’ with online classes during COVID-19 pandemic; 38% were satisfied; 34% were ‘slightly satisfied’, and only 9% of the college students in Mizoram were ‘dissatisfied’ with online classes during COVID-19 pandemic.

As shown in Table 4.21, among the professional colleges, 31% of students were ‘very satisfied’ with the coverage of their course or syllabus during the COVID-19 pandemic; 38% of students were ‘satisfied’ with the coverage; 22% of students were ‘slightly satisfied’, and only 9% of students were ‘dissatisfied’ with the coverage of their course or syllabus. The table also revealed that 27% of students from general degree colleges were ‘very satisfied’ with the coverage of their course or syllabus during the COVID-19 pandemic, 40% of students were ‘satisfied’, and 25% of students were ‘slightly satisfied’, and 8% of students were ‘dissatisfied’ with the coverage of their course or syllabus during COVID-19 pandemic. As a result,

28% of the college students in Mizoram reported being ‘very satisfied’, while 40% of them reported being ‘satisfied’; 24% reported ‘slightly satisfied’, and only 8% reported ‘dissatisfied’ with the coverage of the course or syllabus during the COVID-19 pandemic.

4.4 Objective No. 3: To find out the perception of teachers and students of professional and general degree colleges in Mizoram about web-based learning.

This section deals with the third objective of the study, which is the perception of teachers and students of professional and general degree colleges in Mizoram about web-based learning. To achieve this objective, the investigator used a self-made tool, ‘Perception of College Teachers about Web-based Learning’ and ‘Perception of College Students about Web-based Learning’, for teachers and students, respectively.

4.4.1 Perception of Teachers of Professional and General Degree Colleges in Mizoram about Web-based Learning

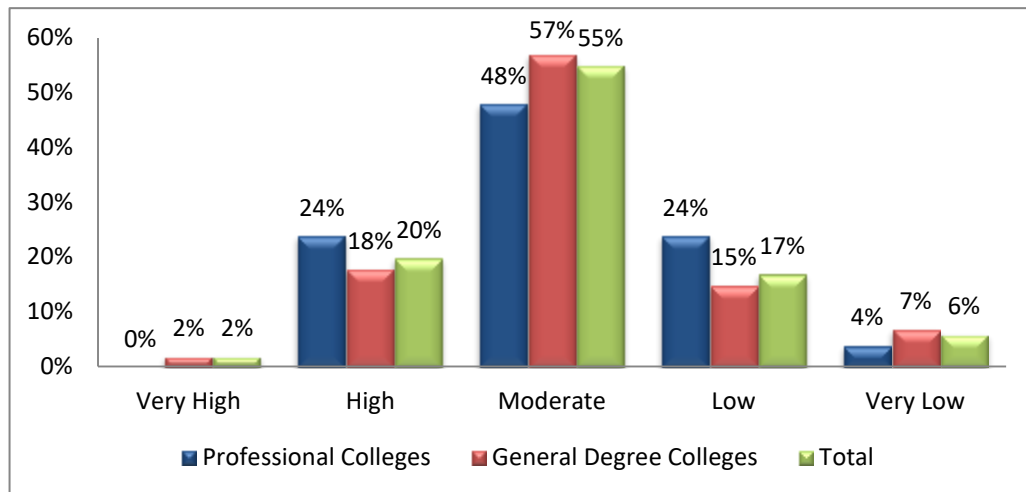
Table 4.22

Perception of Teachers of Professional and General Degree Colleges in Mizoram about Web-based Learning

Group	N	Very positive	Highly positive	Moderately positive	Low positive	Very low positive
Professional Colleges	25	0	6 (24%)	12 (48%)	6 (24%)	1 (4%)
General Degree Colleges	82	2 (2%)	15 (18%)	47 (57%)	12 (15%)	6 (7%)
Total	107	2 (2%)	21 (20%)	59 (55%)	18 (17%)	7 (6%)

Figure 4.1

***Perception of Teachers of Professional Colleges and General Degree Colleges in Mizoram
about Web-based Learning***



The above table (Table 4.22) and figure (Figure 4.1) showed that out of 25 respondents from the professional colleges, the majority (48%) of the teachers had a ‘moderately positive perception’ regarding web-based learning; 24% of the teachers had ‘highly positive perception’ and 24% of the teachers that had ‘low positive perception’ on web-based learning. It could also be seen from the table and figure that only 4% of the teachers had a ‘very low positive perception’, and none of the teachers had a ‘highly positive perception’ regarding the use of web-based learning.

In the meantime, Table 4.22 and Figure 4.1 also revealed that out of 82 respondents from the general degree colleges, the majority (57%) of teachers had a ‘moderately positive perception’ about web-based learning. Only 2% of the teachers from general degree colleges had a ‘very high positive perception’; 18% of the teachers had ‘highly positive perception’ about web-based learning; 15% of the teachers had ‘low positive perception’ about web-based learning and it could also be seen that 7% of the teachers had ‘very low positive perception’ on web-based learning.

It was clear from the above table (Table 4.22) and figure (Figure 4.1) that out of 107 college teachers in Mizoram, the majority (55%) of the teachers had a ‘moderately positive perception’ about web-based learning, while only 2% of the teachers had a ‘very high positive perception’ about web-based learning; 20% of the teachers had a ‘highly positive perception’; 17% of the college teachers had a ‘low positive perception’, and 6% of the teachers from various colleges had a ‘very low positive perception’. Therefore, it could be concluded that the majority of the college teachers in Mizoram had a ‘moderately positive perception’ regarding the use of web-based learning.

Since web-based learning could enhance flexibility, access to resources, collaboration, adaptability, engagement, professional development opportunities, and preparation for the digital age and further study, college teachers often use web-based tools reasonably. So, it could be stated that college teachers in Mizoram had a ‘moderately positive perception’ towards web-based learning.

4.4.2 Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning

Table 4.23
Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning

Group	N	Very high positive	Highly positive	Moderately positive	Low positive	Very Low positive
Professional Colleges	278	7 (3%)	50 (18%)	168 (60%)	33 (12%)	20 (7%)
General Degree Colleges	1625	70 (4%)	234 (14%)	1019 (63%)	230 (14%)	72 (5%)
Total	1903	77 (4%)	284 (15%)	1187 (62%)	263 (14%)	92 (5%)

Figure 4.2

***Perception of Students of Professional and General Degree Colleges in Mizoram
about Web-based Learning***

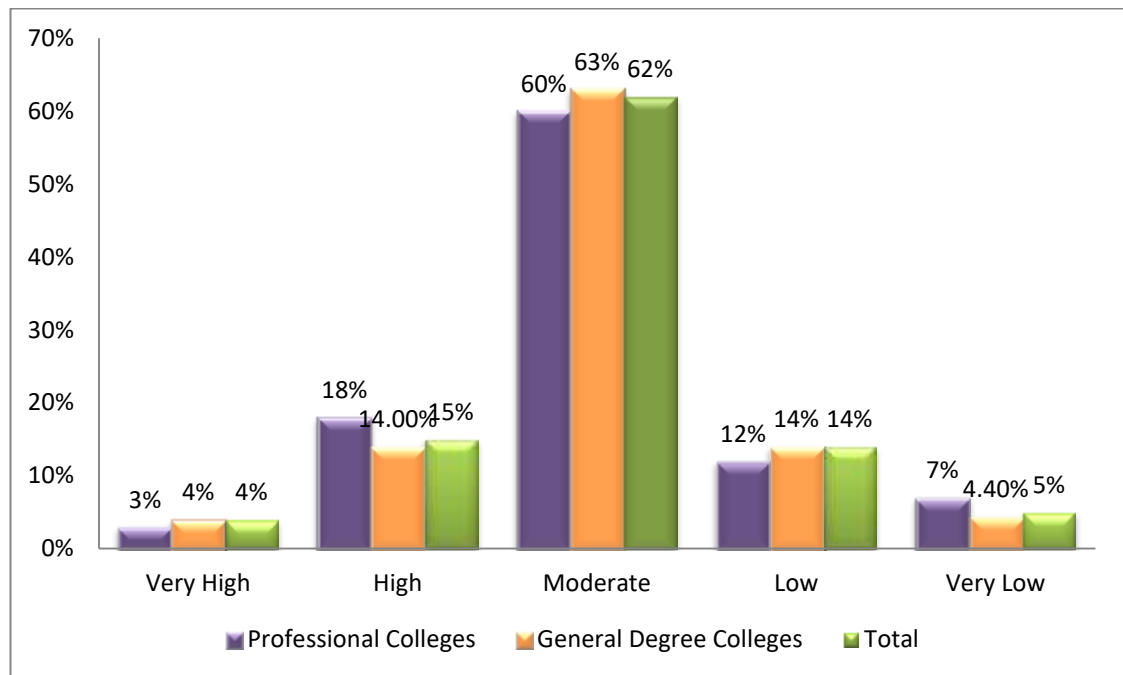


Table 4.23 and Figure 4.2 showed that among 278 students from the professional colleges, the majority (60%) of the students had a ‘moderately positive perception’ about web-based learning; 18% of the students had a ‘highly positive perception’ about web-based learning; 12% of the students had a ‘low positive perception’ about web-based learning; 7% of the students had a ‘very low positive perception’ about web-based learning, and only 3% of them among the professional colleges had a ‘very high positive perception’ about web-based learning.

At the same time, Table 4.23 and Figure 4.2 also revealed that out of 1625 respondents from the general degree colleges, the majority (63%) of the students had a ‘moderately positive perception’ about web-based learning; 14% of the students a ‘had highly positive perception’; 14% of the students had a ‘low positive perception’ about web-based learning; 5% of the students had a ‘very low positive perception’, and only 4% of the students had a ‘very high positive perception’ about web-based learning.

It could be seen from Table 4.23 and Figure 4.3 that out of 1903 students from different colleges in Mizoram, the majority (62%) of the students had a ‘moderately positive perception’ about web-based learning; 15% of the students had a ‘highly positive perception’; 14% of the students had a ‘low positive perception’; 5% of them had a ‘very low positive perception’, and only 4% of the students had a ‘very high positive perception’ about web-based learning. Therefore, it could be concluded that the students at the general degree colleges in Mizoram had a ‘moderately positive perception’ towards web-based learning.

Students of professional and general degree colleges in Mizoram had a ‘moderately positive perception’ of web-based learning. A web-based learning platform provides students with more flexibility and convenience. It also gave students access to vital information that could help them with their assignments and other academic work.

4.5 Objective No. 4: To find out the uses of web-based learning among teachers and students of professional and general degree colleges in Mizoram

This section addresses the fourth objective of the study, dealing with the use of web-based learning among teachers and students of professional and general degree colleges in Mizoram. To achieve this objective, the investigator used a self-made rating scale, ‘Usage of Web-Based Learning by College Teachers in the Institution’ and ‘Usage of Web-Based Learning by College Students in the Institution’, for teachers and students, respectively.

4.5.1 Usage of Web-based Learning among Teachers of Professional and General Degree Colleges in Mizoram

Table 4.24

Usage of Web-based Learning among Teachers of Professional and General Degree Colleges in Mizoram

Item		Professional Colleges			General Degree Colleges			Overall		
		A*	S**	N***	A*	S**	N***	A*	S**	N***
1	Use the internet for self-study	17 (68%)	8 (32%)	0	52 (63%)	30 (37%)	0	69 (64%)	38 (36%)	0
2	Encourage students to use web-based learning	16 (64%)	9 (36%)	0	38 (46%)	44 (54%)	0	54 (50%)	53 (50%)	0
3	Consultation of the e-textbook	4 (16%)	17 (68%)	4 (16%)	12 (15%)	60 (73%)	10 (12%)	16 (15%)	77 (72%)	14 (13%)
4	Downloaded pictures or diagrams	15 (60%)	10 (40%)	0	28 (34%)	50 (61%)	4 (5%)	43 (40%)	60 (56%)	4 (4%)
5	Preferred transfer of material through online	8 (32%)	17 (68%)	0	30 (37%)	45 (55%)	7 (9%)	38 (36%)	62 (58%)	7 (7%)
6	Use of web-based learning is comfortable	4 (16%)	16 (64%)	5 (20%)	12 (15%)	46 (56%)	24 (29%)	16 (15%)	62 (58%)	29 (27%)
7	Different educational blogs and social media are used for academic interaction	5 (20%)	19 (76%)	1 (4%)	13 (16%)	60 (73%)	9 (11%)	18 (17%)	79 (74%)	10 (9%)
8	Collect materials from the internet	7 (28%)	16 (64%)	2 (8%)	23 (28%)	53 (65%)	6 (7%)	30 (28%)	69 (64%)	8 (7%)
9	Suggest e-content for supplementary learning	9 (36%)	16 (64%)	0	14 (17%)	65 (79%)	3 (4%)	23 (22%)	81 (76%)	3 (3%)
10	Visit links and websites related to the syllabus or course	15 (60%)	10 (40%)	0	31 (38%)	50 (61%)	1 (1%)	46 (43%)	60 (56%)	1 (1%)
11	Use of the internet relating to the course and content of the syllabus because of its quality	6 (24%)	16 (64%)	3 (12%)	20 (24%)	52 (63%)	10 (12%)	26 (24%)	68 (64%)	13 (12%)

12	Preferred online submission of assignments	4 (16%)	16 (64%)	5 (20%)	20 (24%)	44 (54%)	18 (22%)	24 (22%)	60 (56%)	23 (21%)
13	Use different types of audio-video material to update knowledge	11 (44%)	13 (52%)	1 (4)	30 (37%)	50 (61%)	2 (2%)	41 (38%)	63 (59%)	3 (3%)
14	Use e-group for announcements and the arrangement of meetings	14 (56%)	10 (40%)	1 (4)	30 (37%)	45 (55%)	7 (9%)	44 (41%)	55 (51%)	8 (7%)
15	Use web-based learning to overcome an inferiority complex	4 (16%)	15 (60%)	6 (24%)	12 (15%)	63 (77%)	7 (9%)	16 (15%)	78 (73%)	13 (12%)

**A=Always*

***S=Sometimes*

****N=Never*

Web-based learning was becoming more and more popular because of its ability to provide technologically advanced, inexpensive, flexible, and accessible educational experiences that cater to the changing demands of teachers and students in the digital era.

Table 4.24 showed the frequency of web-based learning usage among the teachers of professional and general degree colleges in Mizoram.

It was evident from the table that the majority (68%) of the teachers from professional colleges ‘always’ used the internet for self-study, and the remaining 32% of teachers used the internet ‘sometimes’ for self-study. In the meantime, 63% of the teachers from the general degree colleges ‘always’ used the Internet for self-study, and 37% of teachers ‘sometimes’ used the internet for self-study. The complete data of college teachers indicated that the majority (64%) of the college teachers ‘always’ used the internet for self-study, and 36% of teachers ‘sometimes’ used the internet for self-study. It was clear from Table 4.5 that the majority of college teachers used the Internet to update their knowledge and prepare themselves for their classes.

The table showed that the majority (64%) of the teachers from professional colleges ‘always’ encouraged students to use web-based learning, and 36% of the teachers ‘sometimes’ encouraged students to use web-based learning. The table also showed that 46% of the teachers from general degree colleges ‘always’ encouraged students to use web-based learning, and 54% of the teachers ‘sometimes’ encouraged students to use web-based learning. It was clear from the table that 50% of the college teachers in Mizoram ‘always’ encouraged their students, and the remaining 50% of them ‘sometimes’ urged their students to use web-based learning as it provides a wide variety of resources to enhance different subject matter.

Among the professional colleges, the majority (68%) of the teachers ‘sometimes’ consulted e-textbooks for supplementary knowledge, 16% of the teachers ‘always’ consulted e-textbooks, and the remaining 16% of the teachers ‘never’ consulted e-textbooks. At the same, the majority (73%) of the teachers from the general degree college ‘sometimes’ consulted e-textbooks, 15% of the teachers ‘always’ consulted e-textbooks, and 12% of the teachers ‘never’ consulted e-textbooks. E-textbooks were lightweight and portable, convenient to carry anywhere and save a lot of space; this might have been the reason why the majority (72%) of the college teachers in Mizoram ‘sometimes’ consulted e-textbook; 15% of the teachers ‘always’ consulted e-textbook, and 13% of them ‘never’ consult e-textbooks.

College teachers largely agreed that using diverse learning aids and images was crucial for students’ conceptual development. It was found that the majority (60%) of the teachers from professional colleges ‘always’ downloaded pictures and diagrams for teaching, and 40% of teachers ‘sometimes’ downloaded pictures and diagrams for teaching. While the majority (61%) of the teachers from the general degree colleges ‘sometimes’ downloaded pictures and diagrams for teaching, 34% of the teachers ‘always’ downloaded pictures and diagrams, and only 5% of teachers ‘never’ downloaded photographs and diagrams. It was evident from the table that the majority (56%) of the college teachers in Mizoram ‘sometimes’ downloaded picture diagrams for teaching. Their reasons included the convenience of collecting, sharing, saving and accessing these visuals from anywhere. Furthermore, 40% of the teachers

‘always’ downloaded pictures and diagrams for teaching, and only 4% of them ‘never’ download pictures and diagrams for teaching.

It was evident from Table 4.24 that the majority (68%) of the teachers from the professional college ‘sometimes’ preferred the transfer of learning materials through email or online to their students and 32% of teachers ‘always’ preferred to transfer materials through email or online. It also revealed that 37% of the teachers from the general degree college ‘always’ preferred to transfer materials through email or online to their students; 55% of the teachers ‘sometimes’ preferred to transfer materials through email or online to their students, and only 9% of them ‘never’ preferred the transfer of materials through email or online. Online modes were favoured for sharing due to their flexibility time-consuming. This explained why the majority (58%) of the college teachers in Mizoram ‘sometimes’ preferred the transfer of materials through email or online to their students; 36% of the college teachers ‘always’ preferred the transfer of materials through email or online to their students, and only 7% of them ‘never’ preferred the transfer of materials through email or online.

Table 4.24 showed that a majority (64%) of the teachers in the professional colleges ‘sometimes’ used web-based learning comfortably. A smaller percentage, 16%, ‘always’ felt comfortable, while the remaining 16% ‘never’ did. For teachers in general degree colleges, the table revealed that 56% ‘sometimes’ used web-based learning with ease. However, a notable 29% ‘never’ felt comfortable with it, and only 15% ‘always’ used it comfortably. The challenges of web-based learning, such as minimal interaction, difficulty connecting with students, and the complexity of shifting from traditional methods, likely contributed to these findings. Consequently, across all colleges in Mizoram, the majority (58%) of teachers only ‘sometimes’ used web-based learning comfortably. Furthermore, 26% of teachers ‘never’ felt comfortable with it, and just 15% ‘always’ were.

It was evident from the table mentioned above the majority (76%) of the teachers ‘sometimes’ used different educational blogs and social media for academic interaction; 20% of teachers from the professional college ‘always’ used different

educational blogs and social media for academic interaction, and only 4% of teachers ‘never’ use different educational blogs and social media for academic interaction. At the same time, the majority (73%) of the teachers from general degree colleges ‘sometimes’ used different educational blogs and social media for academic interaction; 16% of teachers from the general degree college ‘always’ used different educational blogs and social media for academic interaction, and 11% of them ‘never’ used different educational blogs and social media for academic interaction. Therefore, the majority (74%) of college teachers ‘sometimes’ used different educational blogs and social media for academic interaction; 17% of teachers ‘always’ used different educational blogs and social media for academic interaction, and only 9% of teachers ‘never’ used different educational blogs and social media for academic interaction. Thus, it could be concluded that not all college teachers were engaged with the innovation and wavered to slot into certain educational blogs and social media platforms.

Table 4.24 indicated that the majority (64%) of teachers from professional colleges ‘sometimes’ collected materials from the internet; 28% of teachers ‘always’ used the internet for gathering materials, and only 8% of the teachers ‘never’ collected materials from the internet. It also shows that the majority (65%) of teachers from general degree colleges ‘sometimes’ collected materials from the internet; 28% of teachers ‘always’ gathered materials from the internet. Only 7% of teachers ‘never’ use the internet to collect materials in general degree colleges. Thus, the majority (64%) of college teachers in Mizoram ‘sometimes’ collected materials from the internet; 28% of teachers ‘always’ used the internet for gathering materials, and only 7% of college teachers ‘never’ used the internet for collecting materials. It may be stated that unfamiliarity and insecurity regarding the usage of the internet could be factors contributing to the reluctance to collect materials from the internet.

Among the teachers from professional colleges, the majority (64%) of them ‘sometimes’ suggested e-content as supplementary reading materials; 36% of teachers ‘always’ suggested e-content as supplementary reading materials, and. It could be seen from Table 4.24 that among the teachers of general degree colleges in Mizoram, the majority (79%) of the teachers ‘sometimes’ suggested e-content as

supplementary reading materials; 17% of teachers ‘always’ suggested e-content as supplementary reading materials, while only 4% of them ‘never’ suggested e-content as supplementary reading materials. From the overall responses, it was clear that the majority (76%) of the college teachers in Mizoram ‘sometimes’ suggested e-content as supplementary reading materials; 22% of teachers ‘always’ suggested e-content as supplementary reading materials; the remaining 3% of college teachers ‘never’ suggested e-content to their students as supplementary reading materials. It may be difficult for teachers to comprehend the supplementary materials available on the internet, which might be why teachers sometimes suggest supplementary reading from the Internet. Teachers might have found it challenging to fully grasp the supplementary materials available online, which could explain why they sometimes suggested supplementary reading from the internet.

The majority (60%) of the teachers from professional colleges ‘always’ visited various links or websites which would help them in their teaching and could make the learning simpler and more understandable for the students, while 40% of teachers ‘sometimes’ visited various links or websites related to their syllabus or course. In the meantime, among the teachers of general degree colleges in Mizoram, the majority (61%) of the teachers ‘sometimes’ visited various links or websites related to their syllabus or course; 36% of teachers ‘always’ visited various links or websites relating to their syllabus or course, and only 1% of teachers ‘never’ visited certain links or websites related to their syllabus or course. Among the college teachers in Mizoram, the majority (56%) of the college teachers ‘sometimes’ visited various links or websites related to their syllabus or course; 43% of teachers ‘always’ visited various links or websites related to their syllabus or course, only 1% teachers ‘never’ visited such links or websites related to their syllabus or course. As it was easier for the teachers to browse links or websites than look at the hard copy of the syllabus or course, it might have been the reason that the majority of the teachers preferred to visit certain links or websites which were related to their syllabus or courses.

Table 4.24 displayed that the majority (64%) of the teachers ‘sometimes’ used the course and content related to their syllabus or course available on the

internet, as there were enough quality material available as per the course content of the institution. 24% of teachers from the professional college ‘always’ used the internet, and only 8% of teachers ‘never’ used the internet. The table also revealed the majority (63%) of the teachers from the general degree colleges ‘sometimes’ used the internet; 24% of teachers ‘always’ used the internet as the quality of the content of the syllabus or course available was good, and the remaining 12% of teachers ‘never’ used the internet. It was clear stated that the majority (64%) of the college teachers in Mizoram ‘sometimes’ used the internet, 24% of teachers ‘always’ used the internet, and 11% of teachers ‘never’ used the internet to ensure the quality of complementary reading materials available.

It was clear that the majority (64%) of the teachers from the professional colleges ‘sometimes’ preferred the online submission of assignments; 20% of teachers ‘never’ preferred the online submission of assignments, while 16% of teachers ‘while’ preferred the online submission of assignment. Among the general degree colleges, the majority (54%) of the teachers ‘sometimes’ preferred the online submission of assignments, 24% of teachers ‘always’ preferred the online submission of assignments by the students, and 22% of teachers ‘never’ prefer online submission of assignment. It was evident that the majority (56%) of the college teachers in Mizoram ‘sometimes’ preferred the online submission of assignments as it was easily accessible anywhere and anytime; 22% of college teachers ‘always’ preferred the online submission of assignments by the students, but there were teachers (21%) who ‘never’ prefer to receive assignments submitted by the students.

The table showed that the professional college teachers most frequently chose the ‘sometimes’ option for using audio-video materials to update their knowledge. This meant that the majority (52%) of the teachers ‘sometimes’ used the different types of audio-video materials for updating their knowledge; 44% of teachers ‘always’ used the different types of audio-video materials, and only 4% ‘never’ used the different types of audio-video material for updating their knowledge. Among the general degree colleges, the majority (61%) of the teachers ‘sometimes’ used the different types of audio-video materials to update their knowledge; 56% of teachers ‘always’ used the different types of audio-video materials; and only 2% of them

‘never’ used the different types of audio-video materials for updating their knowledge. It could also be seen from the table that the majority (59%) of the college teachers ‘sometimes’ used the different types of audio-video materials to help them update their knowledge; 38% of college teachers ‘always’ used the different types of audio-video materials to update their knowledge, while (2%) of college teachers in Mizoram ‘never’ used the different types of audio-video materials to update their knowledge.

It was evident from Table 4.24 that the majority (56%) of teachers from professional colleges ‘always’ used e-groups within the class for making announcements and arrangements for meetings; 40% of teachers ‘sometimes’ used e-group within the class for announcement and arrangement for meeting and only 4% of them ‘never’ used e-group for announcement and arranging a meeting. It could also be seen that the majority (55%) of the teachers from general degree colleges ‘sometimes’ used e-group within the class for announcements and arrangement for meetings; 37% of teachers ‘always’ used e-groups for making announcements and arranging a meeting, and 9% of them ‘never’ used e-group for giving certain information to the class. Among the college teachers in Mizoram, the majority (51%) of the teachers ‘sometimes’ used e-group within the class for announcements and arrangements for meetings as it was convenient to share information through e-groups. It was also evident that 41% of them ‘always’ used e-groups within the class to make announcements and arrange meetings. There were only 7% of teachers who ‘never’ used e-groups within the class for announcing and posting necessary information.

Online education platforms can be powerful tools for building confidence, self-esteem, and personal development, thereby helping individuals overcome an inferiority complex. So, Table 4.24 revealed that the majority (60%) of teachers ‘sometimes’ used web-based learning to overcome inferiority complex, 16% of teachers from professional colleges ‘always’ used web-based learning to overcome the inferiority complex, and the remaining 16% of teachers ‘never’ used web-based learning to overcome inferiority complex. On the other hand, the majority (77%) of the teachers from general degree colleges ‘sometimes’ used web-based learning to

overcome inferiority complex; 15% of teachers ‘always’ used web-based learning to overcome inferiority complex, and only 9% of teachers ‘never’ used web-based learning to overcome inferiority complex. Among the college teachers in Mizoram, the majority (73%) of the college teachers ‘sometimes’ used web-based learning to overcome their inferiority complex; 15% of teachers ‘always’ used web-based learning to help them overcome their inferiority complex, and only 10% of college teachers in Mizoram ‘never’ used the web-based learning to overcome inferiority complex to achieve their goals with determination and resilience.

4.5.2 Usage of Web-based Learning among Students of Professional and General Degree Colleges in Mizoram

Table 4.25

Usage of Web-based Learning among Students of Professional and General Degree Colleges in Mizoram

Item		Professional Colleges			General Degree Colleges			Overall		
		A*	S**	N***	A*	S**	N***	A*	S**	N***
1	Use the internet for self-study	117 (42%)	159 (57%)	2 (1%)	595 (37%)	995 (61%)	35 (2%)	712 (37%)	1154 (61%)	37 (2%)
2	The use of web-based learning motivates me	57 (21%)	204 (73%)	17 (6%)	333 (20%)	1091 (67%)	201 (12%)	390 (20%)	1295 (68%)	218 (11%)
3	Consultation of e-textbook	48 (17%)	182 (46%)	47 (17%)	244 (15%)	1112 (68%)	269 (17%)	292 (15%)	1294 (68%)	317(17%)
4	Downloaded pictures or diagrams	137 (49%)	129 (46%)	12 (4%)	506 (31%)	942 (58%)	177 (11%)	643 (34%)	1071 (56%)	189 (10%)
5	Preferred transfer of material through online	80 (29%)	168 (60%)	29 (10%)	468 (29%)	992 (61%)	165 (10%)	548 (29%)	1160 (61%)	195 (10%)
6	Use of web-based learning is comfortable	52 (19%)	159 (57%)	67 (24%)	338 (21%)	996 (61%)	291 (18%)	390 (20%)	1155 (61%)	358 (19%)
7	Different educational blogs and	55	185	38	331	1106	188	386	1291	226

	social media are used for academic interaction	(20%)	(67%)	(14%)	(20%)	(68%)	(12%)	(20%)	(68%)	(12%)
8	Collect materials from the internet	107 (38%)	163 (59%)	8 (3%)	513 (32%)	1039 (64%)	73 (4%)	620 (33%)	1202 (63%)	81 (4%)
9	Suggest e-content for supplementary learning	58 (21%)	197 (71%)	21 (8%)	256 (16%)	1217 (75%)	152 (9%)	314 (17%)	1414 (74%)	175 (9%)
10	Visit links and websites related to the syllabus or course	93 (33%)	173 (62%)	12 (4%)	585 (36%)	957 (59%)	83 (5%)	678 (36%)	1130 (59%)	95 (5%)
11	Use of the internet relating to the course and content of syllabus because of its quality	53 (19%)	191 (69%)	34 (12%)	393 (24%)	1089 (67%)	143 (9%)	446 (23%)	1280 (67%)	177 (9%)
12	Preferred online submission of assignments	95 (34%)	123 (44%)	60 (22%)	747 (46%)	768 (47%)	110 (7%)	842 (44%)	891 (47%)	170 (9%)
13	Use different types of audio-video material to update knowledge	96 (35%)	138 (50%)	44 (16%)	435 (27%)	947 (58%)	243 (15%)	531 (28%)	1085 (57%)	287 (15%)
14	Use e-group for announcement and arrangement of meetings	107 (38%)	155 (56%)	13 (5%)	432 (27%)	1090 (67%)	103 (6%)	539 (28%)	1245 (65%)	116 (6%)
15	Use web-based learning to overcome inferiority complex	37 (13%)	199 (72%)	40 (14%)	284 (17%)	1148 (71%)	193 (12%)	321 (17%)	1347 (71%)	235 (12%)

*A=Always

**S=Sometimes

***N=Never

From Table 4.25, it was clear that the majority (57%) of the students from professional colleges ‘sometimes’ used the internet for self-study, 42% of students

‘always’ used the internet for self-study, and only 1% ‘never’ use the internet for self-study. It was evident that the majority (61%) of the students from general degree college ‘sometimes’ used the internet for self-study; 37% of students ‘always’ used the internet for self-study; however, the other 2% of students ‘never’ used the internet for self-study. As shown in the table, the majority (61%) of the college students in Mizoram ‘sometimes’ used the internet for self-study, valuing its ability to provide helpful data or information for their assignments and academic work; 37% of college students ‘always’ used the internet for self-study, and only 2% of students ‘never’ used the internet for self-study.

As seen from Table 4.25, the majority (73%) of the students from professional colleges stated that the use of web-based learning ‘sometimes’ motivated them in their studies; 21% of students ‘always’ get motivated when they used web-based learning in their studies; and, only 6% of students stated that the use of web-based learning ‘never’ motivate them in their studies. Among the general degree colleges, the majority (67%) of the students stated that the use of web-based learning ‘sometimes’ motivated them in their studies; 20% of students noted that the use of web-based learning ‘always’ motivated them in their studies; and 12% of them stated that the use of web-based learning ‘never’ motivate them in their studies. The table also shows that the majority (68%) of the college students in Mizoram were ‘sometimes’ motivated when they used web-based learning in their studies; 20% of them were ‘always’ motivated when they used web-based learning in their studies, and 11% college students stated that the use of web-based learning ‘never’ get motivated in their studies. Students found motivation in web-based learning through various positive outcomes. Their attention span increased, their interest in learning grew, and they saw the relevance of the material to their own qualities. This also boosted their confidence and led to greater satisfaction with their academic achievements.

Among professional colleges, the majority (46%) of students ‘sometimes’ consulted e-textbooks, 17% of students ‘always’ consulted e-textbooks for complementary learning materials, and the remaining 37% of students ‘never’ used e-textbooks. Among the general degree colleges, the majority (68%) of

students ‘sometimes’ consulted from e-textbooks, 17% of students ‘never’ consulted e-textbooks and 15% of students ‘always’ consulted e-textbooks. Among the college students in Mizoram, the majority (68%) of them ‘sometimes’ consulted e-textbooks; 17% of students ‘never’ consulted e-textbooks, while 15% of students ‘always’ consulted e-textbooks.

Table 4.25 also showed that the majority (46%) of the students from professional colleges ‘sometimes’ downloaded pictures and diagrams, 49% of students ‘always’ downloaded pictures and diagrams for their learning, and only 4% of them ‘never’ downloaded pictures, diagrams for their studies. It was evident from the table that 31% of students from general degree colleges ‘always’ downloaded pictures and diagrams for their learning, 58% of students ‘sometimes’ downloaded pictures and diagrams, and 11% of them ‘never’ downloaded pictures and diagrams for their studies. As seen in Table 4.25, college students (34%) in Mizoram ‘always’ downloaded pictures and diagrams for their learning as students were able to find pictures and diagrams which were suitable for their study instantly; the majority (56%) of the students ‘sometimes’ downloaded pictures, diagrams, and 10% of students ‘never’ downloaded pictures, diagrams for their studies.

As shown in the above table, the majority (60%) of the students from professional colleges ‘sometimes’ preferred the transfer of material through email or online; 29% of students ‘always’ preferred the transfer of material through email or online, but only 10% of them ‘never’ prefer to transfer their material through email or online. The table also revealed that the majority (61%) of the students from general degree colleges ‘sometimes’ preferred to transfer their material through email or online; 29% of students ‘always’ preferred the transfer of their material through email or online, while only 10% of them ‘never’ preferred to transfer their material through email or online. It was clear that the majority (61%) of the college students in Mizoram ‘sometimes’ preferred the transfer of material through email or online because their teachers and classmates will be able to receive material quickly and more easily than usual; 29% of college students ‘always’ preferred the transfer of material through email or online, at the same time, there were only 10% of students who ‘never’ preferred to transfer their material through email or online.

It was evident from Table 4.25 that the majority (57%) of the students in professional colleges ‘sometimes’ used web-based learning comfortably, 24% of them ‘never’ used web-based learning comfortably, and 19% of students ‘always’ used web-based learning comfortably. Among the general degree colleges, the majority (61%) of the students ‘sometimes’ used web-based learning comfortably, 21% of students ‘always’ used web-based learning comfortably, and 18% of them ‘never’ used web-based learning comfortably. It was found that the majority (61%) of the college students in Mizoram ‘sometimes’ used web-based learning comfortably; at the same time, students who engaged in web-based learning encountered a variety of difficulties, such as lack of concentration and loss of self-control. Despite their in experienced practices regarding the usage of web-based learning, 20% of the college students ‘always’ used web-based learning comfortably, but 19% of them ‘never’ used web-based learning comfortably.

Various educational blogs and social media lie in their ability to democratize access to knowledge, facilitate collaboration and networking, and support continuous learning and professional development. So, as seen in Table 4.25, the majority (67%) of the students from professional colleges ‘sometimes’ used different educational blogs and social media for academic interaction; 20% of students ‘always’ used different educational blogs and social media for academic interaction, and 14% of students ‘never’ used the different educational blogs and social media for academic interaction. Among the general degree colleges, the majority (68%) of the students ‘sometimes’ used different educational blogs and social media for academic interaction; 20% of the students ‘always’ used different educational blogs and social media for academic interaction, and 12% of students ‘never’ used different educational blogs and social media for academic interaction. It was evident that the majority (68%) of the college students in Mizoram ‘sometimes’ used different educational blogs and social media for academic interaction; 20% of college students in Mizoram ‘always’ used different educational blogs and social media for academic interaction; at the same time, only 12% of college students ‘never’ used the different educational blogs and social media for academic interaction.

Through the internet, students could retain knowledge that might have not been included in textbooks, or that could go out of date when it was made available in a more conventional format. However, table 4.25 revealed that college students in Mizoram do not regularly use the internet, stating that the majority (59%) of the students from professional college ‘sometimes’ collected learning materials from the internet; 38% of students ‘always’ collected the learning materials from the internet, and only 3% of them ‘never’ used the internet for collecting learning materials. The table also shows that the majority (64%) of the students from general degree college ‘sometimes’ used the internet for collecting learning materials; 32% of students ‘always’ used the internet for collecting learning materials, and only 4% of them ‘never’ used the internet for collecting learning materials. From the above table, it could be stated that the majority (63%) of them ‘sometimes’ collected learning materials from the internet so that students could work digitally on class-work and assignments using web-based learning tools or platforms; 33% of students ‘always’ collected learning materials from the internet, at the same time, there were also college students (4%) in Mizoram who ‘never’ use the internet for collecting learning materials.

It was evident from the table that the majority (71%) of the students from professional college ‘sometimes’ used the e-content as supplementary reading resources; 21% of students ‘always’ used the e-content as supplementary reading resources; 8% of them ‘never’ used the e-content as supplementary reading resources. The table also revealed that the majority (75%) of the students from general college ‘sometimes’ used e-content as supplementary reading resources, 16% of students ‘always’ used e-content as supplementary reading resources, and 9% of students ‘never’ used e-content as supplementary reading resources. It was also found that the majority (74%) of the students ‘sometimes’ used e-content as supplementary reading resources; 17% of college students in Mizoram ‘always’ used e-content as supplementary reading resources, and 9% of students ‘never’ used e-content as supplementary reading resources. The study revealed that students easily went through topics that were related to their courses by using e-content for supplementary reading resources.

Students visited links or websites because they comprised the appropriate educational program, which could be accessed via different links or websites. So, it was evident that the majority (62%) of students from professional college ‘sometimes’ visited the links or websites related to their syllabus or course; 33% of students ‘always’ visited the links or websites related to their syllabus or course, and 4% of them ‘never’ visited such links or websites. It was clear from Table 4.25 that the majority (59%) of students from general college ‘sometimes’ visited the links or websites related to their syllabus or course; 36% of students ‘always’ visited the links or websites related to their syllabus or course, and 5% of them ‘never’ visited such links or websites. The overall result showed that the majority (59%) of the college students in Mizoram ‘sometimes’ visited the links or websites related to their syllabus or course; 36% of college students ‘always’ visited the links or websites related to their syllabus or course, and only 5% of them ‘never’ visited links or websites which were related to their syllabus or course.

Table 4.25 also showed that the majority (69%) of the students from the professional college ‘sometimes’ used the internet because the content related to their course or syllabus was of high-quality; 19% of students from the professional college ‘always’ used the internet, and 12% of students ‘never’ used the internet to ensure the quality of the content of the syllabus or course available. Among the general degree colleges, the majority (67%) of them ‘sometimes’ used the internet as the content related to the course or syllabus available on the internet because of its quality; 24% of students ‘always’ used the internet; but 9% of the students ‘never’ used the internet. It was evident that the majority (67%) of the students ‘sometimes’ used the internet for its quality that is related to the course or syllabus of the institutes is good; 23% of college students ‘always’ used the internet, however, 9% of the students ‘never’ used the internet.

Due to the flexibility and convenience of technology, students preferred submitting assignments online. This meant that 34% of students from professional colleges ‘always’ opted for online submission of their assignment, the majority (44%) of the students ‘sometimes’ preferred the online submission of their assignment, 22% of the students never choose to submit assignment online. Among

the general colleges, 46% of students ‘always’ preferred the online submission of their assignment; 47% of the students ‘sometimes’ preferred the online submission of assignment; on the other hand, only 7% of students ‘never’ preferred to submit their assignment online. Among the college students in Mizoram, 44% of students ‘always’ preferred the online submission of their assignment, 47% of the students ‘sometimes’ preferred the online submission of assignment, and 7% of students ‘never’ preferred the online submission of assignment.

The above table (Table 4.25) revealed that 35% of students from professional colleges ‘always’ used the different types of audio-video materials to help them in their studies; 50% of them ‘sometimes’ used the different types of audio-video materials to update their knowledge, at the same time, 16% of students ‘never’ used the different types of audio-video materials to help them update their knowledge. It could also be seen from Table 4.25 that 27% of the students from general degree colleges ‘always’ used different types of audio-video materials to update their knowledge; the majority (58%) of the students ‘sometimes’ used different types of audio-video materials to update their knowledge, 15% of students ‘never’ used the different types of audio-video materials, 28% of college students in Mizoram ‘always’ used the different types of audio-video materials to update their knowledge; the majority (57%) of the students ‘sometimes’ used different types of audio-video materials to update their knowledge, on the other hand, 15% of the college students in Mizoram ‘never’ use different types of audio-video materials to update their knowledge.

Among the professional colleges, 38% of students ‘always’ used e-groups to announced an arrangement for meetings; the majority (56%) of the students ‘sometimes’ used e-groups to post necessary information; and 5% of students ‘never’ use e-groups. Among the students of general degree college, 27% of students ‘always’ used the e-groups within the class to post the required information; the majority (67%) of the students ‘sometimes’ used the e-groups within the class to announced and arranged a meeting, 6% of students ‘never’ used the e-groups. Among the college students, 28% of them ‘always’ used the e-groups within the class to announced important information and arranged meetings; the majority (65%)

of the college students ‘sometimes’ used the e-groups to make announcements and arrangements for a meeting; on the other hand, 6% of the college students in Mizoram ‘never’ used the e-groups within the class to announced and arranged for a meeting.

Web-based learning offered an environment of inclusion and acceptance, allowing individuals with an inferiority complex to challenge themselves, develop, and flourish. By using adaptable and easily accessible online learning platforms, students could build self-assurance, pursue their interests, and accomplish their goals with tenacity and perseverance. Table 4.25 showed that the majority (72%) of students from professional colleges ‘sometimes’ used web-based learning to overcome an inferiority complex. In contrast, 14% ‘never’ used it for this purpose, while 13% ‘always’ did. The table also illustrated that among general degree college students, the majority (71%) ‘sometimes’ used web-based learning to address an inferiority complex. On the other hand, 17% ‘always’ used it, and only 12% ‘never’ did. Overall, the responses indicated that 71% of college students in Mizoram ‘sometimes’ used web-based learning to overcome an inferiority complex. Additionally, 17% ‘always’ used it for this reason, and 12% ‘never’ did. This suggested that students utilized web-based learning to overcome an inferiority complex during interactions with teachers or when attending online classes.

4.6 Objective No. 5: To compare the perception of –

To find out the perception regarding web-based learning, the investigator used a rating scale for the teachers and students of professional colleges and general degree colleges. As the rating scale is an ordinal level scale, parametric tests cannot be performed. Thus, the Mann-Whitney U Test, which was a substitute for a t-test to compare groups (Creswell, 2003), was used by the researcher to find out the difference in the perception of professional and general degree college teachers and students regarding web-based learning.

The Kruskal-Wallis test, an alternative test of one-way ANOVA on ranks (Creswell, 2012), was used to compare more than two independent samples of equal or different sample sizes to find out the differences in the perceptions of professional and general-degree college teachers and students regarding web-based learning.

4.6.1 Professional and General Degree College Teachers in Mizoram about Web-based Learning

The researcher used the Mann-Whitney U Test to compare the perceptions of teachers of professional and general degree colleges in Mizoram regarding web-based learning.

Table 4.26

Comparison of Perception of Teachers of Professional and General Degree Colleges in Mizoram about Web-based Learning

Group	N	Mean Rank	Asymptotic Significant (2-tailed)	Decision	Sig. level – 0.05
Professional Colleges	25	63.48	0.079	Retain the H_0	Not Significant
General Degree College	82	51.11			

The table showed a comparison between teachers of professional and general degree colleges in Mizoram regarding their perception of web-based learning. The mean rank of the obtained value by professional college teachers was 63.48, and it was 51.11 for general degree college teachers. The asymptotic value was found to be 0.079, which was not significant at 0.05 levels. Therefore, no significant difference was found in the perception of teachers of professional and general degree colleges in Mizoram regarding web-based learning. Henceforth, the null hypothesis stating “There is no significant difference in the perception of teachers of professional and general degree colleges in Mizoram regarding web-based learning” is accepted.

As indicated by the mean rank of two different groups of colleges, the teachers of professional colleges had a ‘very positive perception’ regarding web-based learning compared to general degree colleges. However, it was not significant. The mean rank (51.11) of teachers of general degree colleges was lower than the mean rank (63.48) of teachers of professional colleges. Professional college teachers likely held a more positive perception of web-based learning because they were better

equipped and more familiar with it. This familiarity could have led to a greater sense of ease and assurance when using web-based learning resources. It's also possible that their teaching fields, such as computer science, medical, or teacher education, were inherently more suited to web-based than those in general degree college. The latter, however, might have faced more widespread challenges that influenced their perception of web-based learning. So, it could be considered that the teachers of professional colleges have comparatively a higher perception than teachers of general degree colleges.

4.6.2 Professional and General Degree College Teachers in Mizoram with reference to their Gender

The Mann-Whitney U Test was employed to compare the perceptions of teachers of professional and general degree colleges in Mizoram regarding web-based learning based on their gender.

Table 4.27

Comparison of Perception of Teachers of Professional and General Degree Colleges in Mizoram regarding Web-based Learning with reference to their Gender

Group	N	Mean Rank	Asymptotic Significant (2-tailed)	Decision	Sig. level – 0.05
Female	58	54.16	0.095	Retain the H_0	Not Significant
Male	49	53.81			

The above table compared the perception of teachers of professional and general degree colleges in Mizoram regarding web-based learning with reference to their gender. For female teachers, the mean rank of the obtained value was 54.16, whereas for male teachers, it was 53.81. It was found that the asymptotic value is 0.095, which was not significant at 0.05 levels. Therefore, no significant difference was found in the perception of college teachers regarding web-based learning in Mizoram with reference to their gender. So, the null hypothesis stating “There is no

significant difference in the perception of teachers of professional and general degree colleges in Mizoram regarding web-based learning with reference to their gender” was accepted.

When it comes to incorporating technology into the classroom, female teachers might have been more willing to experiment with and explore web-based learning tools than their male counterparts. They likely embraced the potential of these tools to improve teaching and learning, leading them to use them more frequently. The flexibility of web-based learning, particularly concerning scheduling and location, could have been especially appealing to female teachers who often faced caregiving or family obligations. These factors might explain why female college teachers in Mizoram held a more positive perception of web-based learning than male teachers.

4.6.3 Professional and General Degree College Teachers in Mizoram with reference to their Discipline.

To find out the differences in the perceptions of professional and general-degree college teachers in Mizoram regarding web-based learning, the Kruskal-Wallis test was used, which was an alternative to one-way ANOVA on ranks (Creswell, 2003).

Table 4.28
Comparison of Perception of Teachers of Professional and General Degree Colleges in Mizoram regarding Web-based Learning with reference to their Discipline

N	Mean	SD	df	Asymptotic significant	Decision	Sig. level - 0.05
107	35.19	2.85	8	0.028	Reject the H ₀	Significant

Table 4.28 showed the differences in the perception of professional and general degree college teachers in Mizoram regarding web-based learning with reference to their discipline. The significant asymptotic value was found to be 0.028,

which was less than the critical value of 0.05. As a result, it showed that there was a significant difference in the perception of teachers of professional and general degree colleges in Mizoram regarding web-based learning with reference to their discipline. Therefore, the null hypothesis stating “There is no significant difference in perception of teachers of professional and general degree colleges in Mizoram regarding web-based learning with reference to their discipline” was rejected.

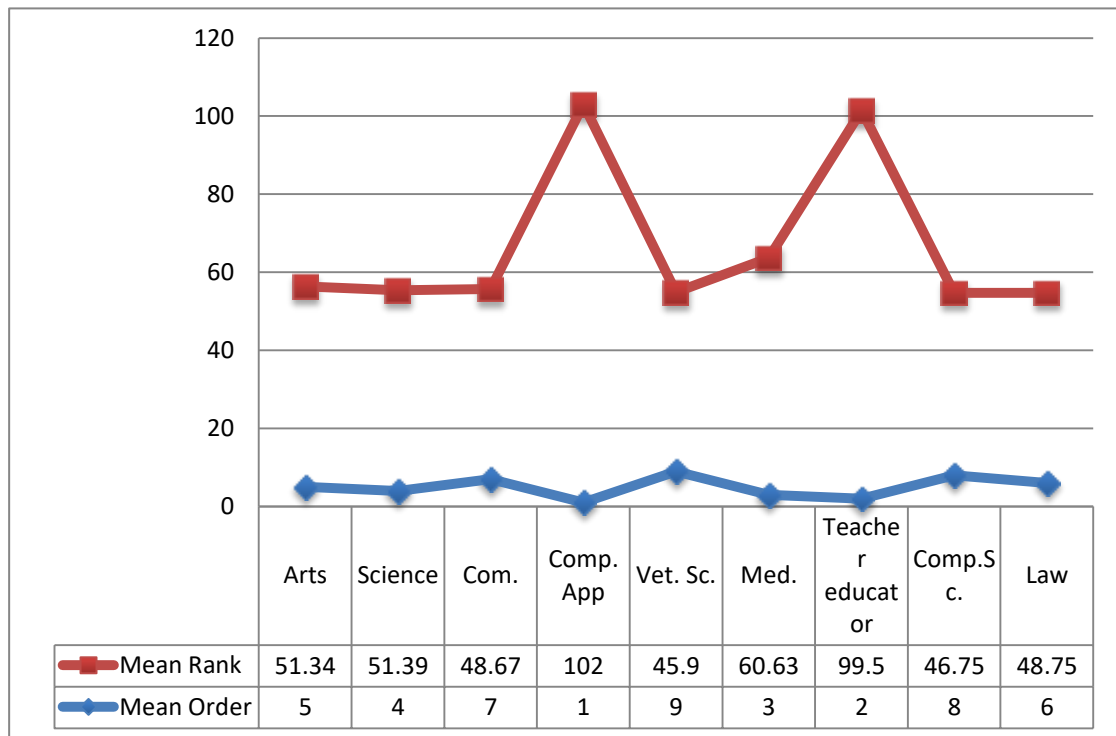
The Kruskal-Wallis test compared more than two groups, so the exact differences between the two groups are described further.

Table 4.29
Mean Ranks of Perception of Teachers of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Discipline

Groups	N	Mean Rank	Rank order
Arts	50	51.34	5
Science	19	51.39	4
Commerce	12	48.67	7
Computer Application	1	102.00	1
Veterinary Science	5	45.90	9
Medical	4	60.63	3
Teacher Education	6	99.50	2
Computer Science	4	46.75	8
Law	6	48.75	6
Total	107		

Figure 4.3

Mean Rank and Mean Order of Perception of Teachers of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Discipline



(Comparison of Perception of Teachers of Professional and General Degree Colleges in Mizoram regarding Web-based Learning with reference to their Discipline)

Table 4.29 and figure 4.3 showed the differences in the mean rank and mean order of perception of teachers of professional and general degree colleges in Mizoram regarding web-based learning with reference to their discipline. It was found that the mean rank of the obtained score of teachers of computer science was 102, and teacher education scored the mean rank of 99.5, followed by medical (60.63), science (51.39), arts (51.34), law (47.84), commerce (51.34), computer technology (46.75) and veterinary science (45.90).

The study applies pair-wise comparisons to analyse multiple population means in pairs and determine whether they are significantly different from one another (Creswell, 2018).

Table 4.30
Pair-wise comparison of Perception of Teachers of Veterinary Science and another discipline about Web-based Learning

Sl. No.	Discipline	Asymptotic Significant	Decision
1	Veterinary Science – Computer Science	0.967	NS*
2	Veterinary Science- Commerce	0.866	NS*
3	Veterinary Science– Law	0.879	NS*
4	Veterinary Science– Arts	0.707	NS*
5	Veterinary Science- Science	0.723	NS*
6	Veterinary Science– Medical	0.477	NS*
7	Veterinary Science – Teacher education	0.004	S**
8	Veterinary Science- Computer Application	0.097	NS*

*NS= Not Significant

**S=Significant

Table 4.30 showed a pair-wise comparison of the perception of teachers of veterinary science and another discipline about web-based learning. It is evident from the table that the asymptotic significant value was more than the critical value at 0.05 level between teachers of veterinary science and computer science (0.967), veterinary science and commerce (0.866), veterinary science and law (0.879), veterinary science and arts (0.707), veterinary science and science (0.723), veterinary science and medical (0.477) and veterinary science and computer application (0.097). It showed that no significant difference was found in the perception of teachers of veterinary science and other disciplines regarding web-based learning.

However, the asymptotic significant difference between teachers of veterinary science and teacher education was found to be 0.004, which was less than the critical value at 0.05 levels; it showed that there was a significant difference in their perceptions of web-based learning.

Table 4.31

Pair-wise comparison of Perception of Teachers of Computer Technology and other disciplines about Web-based Learning

Sl. No.	Discipline	Asymptotic Significant	Decision
1	Computer Science - Commerce	0.914	NS*
2	Computer Science - Law	0.920	NS*
3	Computer Science - Arts	0.775	NS*
4	Computer Science - Science	0.785	NS*
5	Computer Science - Medical	0.525	NS*
6	Computer Science - Teacher education	0.008	S**
7	Computer Science - Computer Application	0.110	NS*

**NS= Not Significant*

***S=Significant*

Table 4.31 showed a pair-wise comparison of the perception of teachers of computer science and another discipline about web-based learning. It was clear from the table that the asymptotic significance value is more than the critical value at the 0.05 level between teachers of computer science technology and commerce (0.914), computer science and law (0.920), computer science and arts (0.775), computer science and science (0.785), computer science and medical (0.525), and computer science and computer science (0.110). It revealed that no significant difference was found in the perception of teachers of computer science and other disciplines with regard to web-based learning.

At the same time, the asymptotic significant difference between teachers of computer science and teacher education was found to be 0.008 regarding web-based learning, which was less than the critical value at the 0.05 level; it showed that there was a significant difference in the perceptions of teachers of computer science and teacher education regarding web-based learning.

Table 4.32

Pair-wise comparison of Perception of Teachers of Commerce and other disciplines about Web-based Learning

Sl. No.	Discipline	Asymptotic Significant	Decision
1	Commerce - Law	0.996	NS*
2	Commerce - Arts	0.788	NS*
3	Commerce - Science	0.811	NS*
4	Commerce - Medical	0.053	NS*
5	Commerce - Teacher education	0.001	S**
6	Commerce - Computer Application	0.097	NS*

**NS= Not Significant*

***S=Significant*

Table 4.32 showed a pair-wise comparison of the perception of teachers of commerce and another discipline about web-based learning. It could be stated that the asymptotic significant value was more than the critical value at the 0.05 level between teachers' of - commerce and law (0.996), commerce and arts (0.788), commerce and science (0.811), commerce and medical (0.053) and, commerce and computer application (0.97). Accordingly, the table showed that no significant difference was found in the perception of teachers of commerce and other disciplines regarding web-based learning.

However, the asymptotic significant difference between teachers of commerce and teacher education was found to be 0.001, which was less than the critical value of the 0.05 level; it means that a significant difference was found in their perceptions of web-based learning.

Table 4.33

**Pair-wise comparison of Perception of Teachers of Law and other disciplines
about Web-based Learning**

Sl. No.	Discipline	Asymptotic Significant	Decision
1	Law - Arts	0.846	NS*
2	Law - Science	0.855	NS*
3	Law - Medical	0.551	NS*
4	Law - Teacher education	0.004	S**
5	Law - Computer Application	0.111	NS*

**NS= Not Significant*

***S=Significant*

A pair-wise comparison of the perception of teachers of the law and other disciplines about web-based learning could be seen in table 4.33. The asymptotic value is more than the critical value of 0.05 between teachers of law and arts (0.846), law and science (0.855), law and medical (0.551), and law and computer application (0.111). As shown in the table, no significant difference was found in the perception of teachers of law and other disciplines regarding web-based learning.

However, the asymptotic value between teachers of law and teacher education was less than the critical value at 0.05 levels, 0.044, which means that a significant difference was found in their perceptions of web-based learning.

Table 4.34

**Pair-wise comparison of Perception of Teachers of Arts and other disciplines
about Web-based Learning**

Sl. No.	Discipline	Asymptotic Significant	Decision
1	Arts-Science	0.995	NS*
2	Arts-Medical	0.563	NS*
3	Arts-Teacher education	0.000	S**
4	Arts-Computer Application	0.104	NS*

**NS= Not Significant*

***S=Significant*

In Table 4.34, which presented a pair-wise comparison of the perception of teachers web-based learning across disciplines, showed that the asymptotic significant difference was more than the critical value of the 0.05 level between teachers of art and science (0.995), arts and medical (0.563) and arts and computer application (0.104). Thus, the table showed that no significant difference was found in the perception of teachers of arts and other disciplines on web-based learning, except teachers between arts and teacher education.

Therefore, the asymptotic significance value was less than the critical value at the 0.05 level between teachers of the arts and teacher education (0.000), which means that a significant difference was found in their perceptions of web-based learning.

Table 4.35

**Pair-wise comparison of Perception of Teachers of Science and other disciplines
about Web-based Learning**

Sl. No.	Discipline	Asymptotic Significant	Decision
1	Science- Medical	0.587	NS*
2	Science- Teacher education	0.001	S**
3	Science- Computer Application	0.110	NS*

**NS= Not Significant*

***S=Significant*

A pair-wise comparison of the perception of teachers of law and other disciplines about web-based learning could be seen in table 4.35. It showed that the asymptotic significant difference was more than the critical value at 0.05 levels between teachers of science and medical (0.587) and between science teachers and computer application teachers (0.110). Table 4.35 revealed that no significant difference was found in the perception of science teachers and other disciplines on web-based learning.

However, the asymptotic significant difference (0.001) between teachers of science and teacher education was less than the critical value at 0.05 levels, which means that there was a significant difference in the perception of teachers of science and other disciplines on web-based learning.

Table 4.36

Pair-Wise Comparison of Perception of Teachers of Medical, Teacher Education and Computer Application about Web-based Learning

Sl. No.	Discipline	Asymptotic Significant	Decision
1	Medical - Teacher Education	0.051	NS*
2	Medical - Computer Application	0.231	NS*
3	Teacher Education - Computer Application	0.940	NS*

**NS= Not Significant*

Table 4.36 showed a pair-wise comparison of the perceptions of teachers of medical, teacher education, and computer science regarding web-based learning. The asymptotic significant difference is higher than the critical value at the 0.05 levels between teachers of medical and teacher education (0.051), between teachers of medical and computer application (0.231), and between teachers of teacher education and computer application (0.940).

Therefore, it was clear that no significant difference was found in the perceptions of teachers of medical, teacher education, and computer application regarding web-based learning.

Teachers of teacher education in Mizoram had a significantly positive perception of web-based learning, as revealed by a pair-wise comparison of perceptions across professional and general degree colleges. This positive outlook can be attributed to their diverse educational backgrounds; teacher education is a multidisciplinary field encompassing subjects like arts, science, technology, commerce, music, and fine arts. This broad disciplinary knowledge allows them to integrate and make web-based learning more comprehensive. Their expertise in learning theories, teaching techniques, pedagogical philosophies, and instructional strategies also equips them to effectively facilitate web-based learning experiences that align with best educational practices. Teachers of teacher education are generally

well-versed in active learning, differentiation, and assessment, which are crucial for creating engaging and relevant web-based learning environments.

However, the perception of teachers of medical, teacher education, and computer application fields regarding web-based learning may not hold significant difference. This could be due to several factors including potential bias, limited understanding, and resistance to change, concerns about quality and equity, and various instructional influences.

4.6.4 Professional and General Degree College Students in Mizoram about Web-based Learning

The researcher employed the Mann-Whitney U Test to compare the perception of students of professional and general degree colleges in Mizoram regarding web-based learning.

Table 4.37
Comparison of Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning

Group	N	Mean Rank	Asymptotic Significant	Decision	Sig. level – 0.05
Professional Colleges	278	1219.80	0.000	Reject the H_0	S
General Degree Colleges	1625	906.19			

S=Significant

The table showed a comparison between students of professional and general degree colleges in Mizoram regarding web-based learning. The mean rank of the obtained value by professional college students was 1219.80, and it was 906.19 for general degree college students. The asymptotic value was found to be 0.000, which was significant at the 0.05 level. Thus, a significant difference was found in the perception of students of professional and general degree colleges in Mizoram regarding web-based learning. Therefore, the null hypothesis stating “There is no

significant difference in the perception of students of professional and general degree colleges in Mizoram regarding web-based learning” was rejected.

However, the mean rank (1219.80) of students of professional colleges was higher than the mean rank (906.19) of students of general degree colleges. Professional college students generally had a ‘higher perception’ towards web-based learning due to its alignment with career goals, exposure to technology, flexibility, practical applications, and institutional support. Meanwhile, students in general degree colleges may have had a diversified perception of web-based learning concerning a number of factors such as educational background, learning preferences, and experience with online education. Some students from general degree colleges may hold concerns about the quality of online courses, the level of interaction with teachers and peers, and the credibility of online credentials. Therefore, it can be concluded that the students of professional colleges had a ‘higher perception’ regarding web-based learning than students of general degree colleges.

4.6.5 Professional and General Degree College Students in Mizoram about Web-based Learning with reference to their Gender

The researcher employed the Mann-Whitney U Test to compare the perceptions of students of professional and general degree colleges in Mizoram regarding web-based learning based on their gender.

Table 4.38
Comparison of Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Gender

Group	N	Mean Rank	Asymptotic Significant	Decision	Sig. level – 0.05
Female	1031	945.14	0.594	Retain the H_0	NS*
Male	872	960.11			

*NS=Not Significant

The above table (Table 4.38) showed the comparison of the perceptions of students of professional and general degree colleges in Mizoram regarding web-based learning with reference to their gender. The mean rank of the obtained value of female students was 945.14, while the mean rank of male students was 960.11. It was found that the asymptotic value was 0.594, which was not significant at the 0.05 level. Therefore, no significant difference was found in the perception of college students regarding web-based learning in Mizoram with reference to their gender. So, the null hypothesis stating “There is no significant difference in the perception of students of professional and general degree colleges in Mizoram regarding web-based learning with reference to their gender” was accepted.

However, the mean rank (945.14) of female students was lower than the mean rank (960.11) of male students. Compared to female students, male students typically exhibit levels of confidence and proficiency when using web-based learning technology. They likely felt more secure when engaging with digital resources, navigating web-based learning platforms, and using online tools to assist with their learning. So, it can be concluded that male students had a higher perception of web-based learning than female students in professional and general degree colleges.

4.6.6 Professional and General Degree College Students in Mizoram about Web-based Learning with reference to their Discipline

Table 4.39
Comparison of Perception Students of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Discipline

N	Mean	SD	df	Asymptotic Significant	Decision	Sig. level - 0.05
1903	2.34	2.07	8	0.000	Reject the H ₀	S*

*S=Significant

Table 4.39 showed the differences in the perception of students of professional and general degree colleges in Mizoram about web-based learning with

reference to their discipline. The asymptotic significance value was found to be 0.000, which was less than the critical value at the 0.05 level; there was a significant difference in the perception of students of professional and general degree colleges in Mizoram about web-based learning with reference to their discipline. Therefore, the null hypothesis stating “There is no significant difference in perception of students of professional and general degree colleges in Mizoram about web-based learning with reference to their discipline” was rejected.

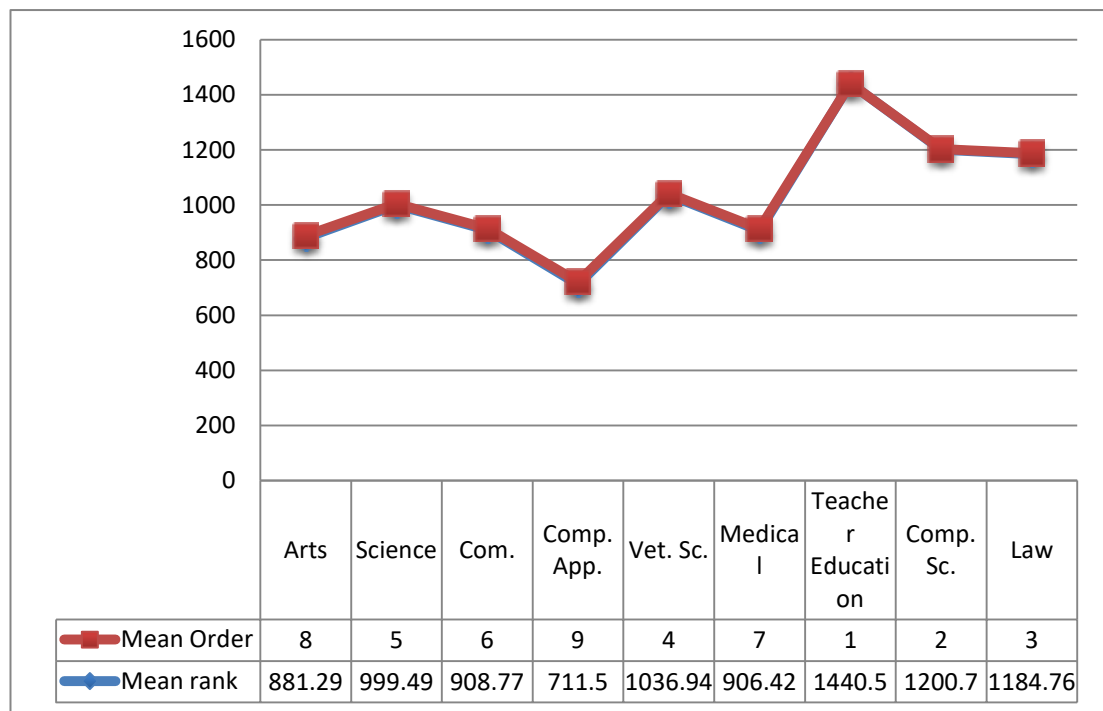
The researcher used the Kruskal-Wallis test to ascertain if there were significant differences in the perceptions of students of professional and general degree colleges in Mizoram about web-based learning based on their gender. The differences are described further.

Table 4.40
Mean Ranks of Perception of Students of Professional and General Degree
Colleges in Mizoram about Web-based Learning with reference to their
Discipline

Groups	N	Mean Rank	Rank order
Arts	1045	881.29	8
Science	271	999.49	5
Commerce	279	908.77	6
Computer Application	30	711.50	9
Veterinary Science	35	1036.94	4
Medical	64	906.42	7
Teacher education	108	1440.05	1
Computer Science	42	1200.70	2
Law	29	1184.76	3
Total	1903		

Figure 4.4

Mean Rank and Mean Order of Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Discipline



(Comparison of Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Discipline)

The above table 4.40 and figure 4.4 showed the mean rank and mean order of perception of students of professional and general degree colleges in Mizoram with reference to their discipline. It was found that students of teacher education had the mean rank of 1440.05, followed by students of computer science (1200.70), law (1184.76), veterinary science (1036.94), science (51.34), commerce (908.77), medical (906.42), arts (881.29) and computer application (711.50).

The study applies pair-wise comparisons to analyze multiple population means in pairs and determine whether they are significantly different from one another.

Table 4.41

**Pair-wise comparison of Perception of Students of Law and other discipline
about Web-based Learning**

Sl. No.	Discipline	Asymptotic Significant	Decision
1	Law - Arts	0.100	NS*
2	Law - Computer Application	0.172	NS*
3	Law – Commerce	0.065	NS*
4	Law – Science	0.007	S**
5	Law - Veterinary Science	0.018	S**
6	Law - Computer Science	0.000	S**
7	Law - Medical	0.000	S**
8	Law - Teacher education	0.000	S**

**NS= Not Significant*

***S=Significant*

The above table (table 4.41) showed a pair-wise comparison of perceptions of students of law and other disciplines regarding web-based learning. The asymptotic significant difference was higher than the critical value at 0.05 levels between students of law and arts (0.100), law and computer application (0.172), and law and commerce (0.65). No significant difference was found in the perceptions of law students and other disciplines on web-based learning.

However, the asymptotic significant difference was less than the critical value at 0.05 levels on the students' between law and science (0.007), law and veterinary science (0.018), law and computer science (0.000), law and medical (0.000) and between students of law and teacher education (0.000). This signified that there was a significant difference in the perception of students in each group on web-based learning.

Legal education, with its interactive and immersive nature, along with its focus on critical thinking and professional skill development, can influence how law students view web-based learning. Even though online platforms offer flexibility and

easy access, they might struggle to replicate the dynamic and participatory learning environments typically found in legal studies.

Table 4.42

Pair-wise comparison of the Perception of Students of Arts and other discipline about Web-based Learning

Sl. No.	Discipline	Asymptotic Significant	Decision
1	Arts - Computer Application	0.803	NS*
2	Arts - Commerce	0.453	NS*
3	Arts - Science	0.002	S**
4	Arts - Veterinary Science	0.098	NS*
5	Arts - Computer Science	0.000	S**
6	Arts - Medical	0.000	S**
7	Arts - Teacher education	0.000	S**

**NS= Not Significant*

***S=Significant*

Table 4.42 showed the perception of students of arts and other disciplines about web-based learning. It is clear from the table that the asymptotic value was more than the critical value at the 0.05 level between the students of - arts and computer application (0.803), arts and commerce (0.453), and arts and veterinary science (0.098). So, it can be seen that no significant difference was found in the perception of students of arts with the students of computer application, commerce and veterinary science regarding web-based learning.

At the same time, the asymptotic value was less than the critical value at the 0.05 levels between the students of arts and science (0.002), arts and computer science (0.000), arts and medical (0.000) and arts and teacher education (0.000). Therefore, it can be said that there was a significant difference in the perception of students of arts, science, computer science, medical, and teacher education regarding web-based learning.

While web-based learning offered numerous advantages, such as flexibility and accessibility, art students likely viewed it differently due to the unique challenges and demands of their field. To effectively engage art students, web-based learning strategies needed to be modified to suit their specific requirements and preferences. Additionally, establishing an inclusive and encouraging web-based learning community was crucial to address these disciplinary considerations.

Table 4.43

Pair-wise comparison of the Perception of Students of Computer Application and other discipline about Web-based Learning

Sl. No.	Discipline	Asymptotic Significant	Decision
1	Computer Application - Commerce	0.982	NS*
2	Computer Application - Science	0.377	NS*
3	Computer Application - Veterinary Science	0.338	NS*
4	Computer Application - Computer Science	0.033	S**
5	Computer Application - Medical	0.015	S**
6	Computer Application - Teacher education	0.000	S**

**NS= Not Significant*

***S=Significant*

The above table (table 4.43) compared students' perceptions of computer application with other disciplines regarding web-based learning. The asymptotic significant difference was more than the critical value at 0.05 levels between the students of computer application and commerce (0.982), computer application and commerce (0.377), and computer application and veterinary science (0.338). It was clear from the table that no significant difference was found in the perceptions of computer application students and the students of commerce, science, and veterinary science on web-based learning.

However, the asymptotic significance value was less than the critical value at 0.05 levels between the students of computer application and computer science (0.033), computer application and medical (0.015), and computer application and

teacher education (0.000). Hence, it was evident that there was a significant difference in the perceptions of students of computer application with computer science, medical, and teacher education regarding web-based learning.

Due to its technological competence, capacity to adapt to online environments, resource accessibility, relevance to their field of study, collaboration opportunities, and flexibility, web-based learning may be perceived more favourably by computer application students.

Table 4.44

Pair-wise comparison of the Perception of Students of Commerce and other discipline about Web-based Learning

Sl. No.	Discipline	Asymptotic Significant	Decision
1	Commerce - Science	0.052	NS*
2	Commerce - Veterinary Science	0.192	NS*
3	Commerce - Computer Science	0.002	S**
4	Commerce - Medical	0.000	S**
5	Commerce - Teacher education	0.000	S**

**NS= Not Significant*

***S=Significant*

Table 4.44 showed a comparison between the perceptions of students of commerce and other disciplines about web-based learning. The asymptotic value was more than the critical value at 0.05 levels between commerce students and science students (0.052) and between commerce students and veterinary science students (0.192), which means that no significant difference was found between commerce students and science students as well as between the students of commerce and veterinary science on web-based learning.

The table also clearly showed that the asymptotic significance value was less than the critical value of 0.05 levels between commerce students and computer science students (0.002), between commerce students and medical students (0.000), and between commerce students and students of teacher education (0.000). So, it can

be stated that there was a significant difference between the students of - commerce and computer science, commerce and medical, commerce and teacher education with regard to web-based learning.

A number of factors, including practicality, interaction and communication, experiential learning, assessment techniques, technological obscurities, instructional quality, and career preparation, may influence commerce students' perceptions regarding web-based learning.

Table 4.45

Pair-wise comparison of the Perception of Students of Science and other discipline about Web-based Learning

Sl. No.	Discipline	Asymptotic Significant	Decision
1	Science - Veterinary Science	0.704	NS*
2	Science - Computer Science	0.041	S**
3	Science - Medical	0.008	S**
4	Science - Teacher education	0.000	S**

**NS= Not Significant*

***S=Significant*

The comparison of the perception of students of science and other disciplines about web-based learning could be seen in table 4.45. It showed that the asymptotic value was more than the critical value at 0.05 levels between science students and veterinary science students (0.704), which means that no significant difference was found in the perception of science students and veterinary science students with regard to web-based learning.

At the same time, the table also showed that the asymptotic significant difference was less than the critical value of 0.05 levels between science students and computer science students (0.041), between the students of science and medical (0.008) and between the students of science and teacher education (0.000), which signified that there was a significant difference on the perception of science students

with students of computer science, medical and teacher education regarding web-based learning.

The perception of web-based learning among science students may depend on issues like the availability of laboratory and hands-on activities, content complexity, peer collaboration, access to laboratory facilities and equipment, practical application and fieldwork, evaluation and assessment methods, and technological limitations.

Table 4.46

Pair-wise comparison of Perception of Students of Veterinary Science and other discipline about Web-based Learning

Sl. No.	Discipline	Asymptotic Significant	Decision
1	Veterinary - Computer Science	0.238	NS*
2	Veterinary - Medical	0.155	NS*
3	Veterinary - Teacher education	0.000	S**

**NS= Not Significant*

***S=Significant*

The above table (table 4.6) compared the perceptions of students of veterinary science and other disciplines regarding web-based learning. As shown in the table, the asymptotic significant differences was higher than the critical value at 0.05 levels between students of veterinary science and computer science (0.238) and between students of veterinary science and medical (0.155), which means that no significant difference was found in the perception of students of veterinary science with computer science and teacher education on the use of web-based learning.

The table also showed that the asymptotic significance value was less than the critical value at the 0.050 level between students of veterinary science and teacher education (0.000). This means that there was a significant difference in the perception of students of veterinary science and teacher education relating to web-based learning. It could be concluded that students of veterinary science and teacher education had different prospects with reference to their respective fields. Veterinary

science students may prioritize hands-on training and practical experiences, whereas students of teacher education may value the theoretical coursework.

Table 4.47

Pair-Wise Comparison of Perception of Students of Computer Science, Teacher Education and Medical discipline about Web-based Learning

Sl. No.	Discipline	Asymptotic Significant	Decision
1	Computer Science - Medical	0.883	NS*
2	Computer Science - Teacher education	0.010	S**
3	Medical - Teacher education	0.006	S**

**NS= Not Significant*

***S=Significant*

Table 4.47 compared the perceptions of students of computer science, teacher education, and medical discipline. The table showed that the asymptotic value was higher than the critical value at 0.05 levels between students of computer science and medical (0.883). No significant difference was found in the perceptions of students of computer science and medical about web-based learning.

However, the asymptotic significant difference was less than the critical value at 0.050 levels between students of computer science and teacher education (0.010) and between students of medical and teacher education (0.006). This indicates that there was a significant difference between the students of computer science and teacher education and between medical and teacher education regarding web-based learning.

The requirements and needs of each student in computer science, medical, and teacher education differ with reference to their discipline, which gives them an advantage when it comes to utilizing certain technologies. Therefore, it can be said that there was a significant difference among them.

4.7 Objective No. 6: To compare the uses of web-based learning among–

4.7.1 Professional and General Degree College Teachers in Mizoram

The Mann-Whitney U Test was used to compare the uses of web-based learning among teachers of professional and general degree colleges in Mizoram.

Table 4.48

Comparison of Uses of Web-based Learning among Professional and General Degree College Teachers in Mizoram

Group	N	Mean Rank	Asymptotic Significant	Decision	Sig. level – 0.05
Professional Colleges	25	40.36	0.011	Reject the H ₀	S*
General Degree College	82	58.16			

*S=Significant

The comparison of the uses of web-based learning among teachers of professional and general degree colleges in Mizoram can be seen in Table 4.48. The significant asymptotic value was 0.011, which was less than the critical value at 0.05 levels. A significant difference was found in the use of web-based learning among teachers of professional and general degree colleges in Mizoram. Therefore, the null hypothesis stating “There is no significant difference in the uses of web-based learning among teachers of professional and general degree colleges in Mizoram” was rejected.

However, the mean rank (58.16) of teachers of general degree colleges was higher than the mean rank (40.36) of teachers of professional colleges. The usage of web-based learning by college teachers in Mizoram may vary significantly depending on various factors. The influence and adoption of web-based learning tools, the nature of subject matter, institutional resources, pedagogical approaches, and teaching styles may be factors that cause teachers of general degree colleges to have a higher perception of the usage of web-based learning. Therefore, it can be

stated that the usage of web-based learning was higher among teachers of general degree colleges than the teachers of professional colleges.

4.7.2 Professional and General Degree College Teachers in Mizoram with reference to their Gender

The researcher used the Mann-Whitney U test to compare the uses of web-based learning among teachers of professional and general degree colleges in Mizoram by gender.

Table 4.49

Comparison of Uses of Web-based Learning among Professional and General Degree College Teachers in Mizoram with reference to their Gender

Group	N	Mean Rank	Asymptotic Significant	Decision	Sig. level – 0.05
Female	58	52.16	0.050	Retain the H ₀	NS*
Male	49	56.17			

*NS=Not Significant

Table 4.49 showed the comparison of uses of web-based learning among teachers of professional and general degree colleges in Mizoram. It can be seen from the table that the asymptotic value is 0.050, which was less than the critical value at the 0.05levels. It was found that there was no significant difference in the use of web-based learning between teachers of professional and general degree colleges in Mizoram with reference to their gender. Therefore, the null hypothesis stating “There is no significant difference in the uses of web-based learning between teachers of professional and general degree colleges in Mizoram with reference to their gender” was accepted.

However, the mean rank (56.17) of male teachers was higher than the mean rank (52.16) of female teachers among the professional colleges and general degree colleges. Proficiency in technology may influence the perceptions of male teachers

as more techno-savvy, leading to assumptions about higher usage of web-based learning than female teachers. Therefore, it can be concluded that the usage of web-based learning was higher among male teachers than female teachers of professional and general degree colleges in Mizoram.

4.7.3 Professional and General Degree College Teachers in Mizoram with reference to their Discipline.

The researcher used the Kruskal-Wallis Test to compare the uses of web-based learning among teachers of professional and general degree colleges in Mizoram in relation to discipline.

Table 4.50

Comparison of Uses of Web-based Learning among Professional and General Degree College Teachers in Mizoram with reference to Discipline

N	Mean	SD	df	Asymptotic significant	Decision	Sig. level - 0.05
107	28.09	2.20	8	0.452	Retain the H ₀	NS*

**NS=Not Significant*

Table 4.50 showed the differences in the use of web-based learning among teachers of professional and general degree colleges in Mizoram with reference to discipline. The table shows that the asymptotic significance value is 0.452, which was more than the critical value at the 0.05 levels; it revealed that no significant difference was found in the use of web-based learning among teachers of professional colleges and general degree colleges in Mizoram with reference to their discipline. Therefore, the null hypothesis stating “There is no significant difference in the uses of web-based learning among teachers of professional colleges and general degree colleges in Mizoram with reference to their discipline” was accepted.

Since no significant difference was found in the use of web-based learning among teachers of professional and general degree colleges in Mizoram, multiple

comparisons were not performed as the overall test does not show any significant differences across samples.

4.7.4 Professional and General Degree College Students in Mizoram

The Mann-Whitney U Test was performed to compare the uses of web-based learning among students of professional and general-degree colleges in Mizoram.

Table 4.51

Comparison of Uses of Web-based Learning among Professional and General Degree Colleges Students in Mizoram

Group	N	Mean Rank	Asymptotic Significant	Decision	Sig. level – 0.05
Professional Colleges	278	1107.11	0.000	Reject the H ₀	S*
General Degree College	1625	925.46			

**S=Significant*

The comparison of the uses of students of professional and general degree colleges in Mizoram is shown in Table 4.51. The table indicated that the asymptotic significance value was 0.000, which was less than the critical value at the 0.05 levels. A significant difference was found in the use of web-based learning among students of professional and general degree colleges in Mizoram. Therefore, the null hypothesis stating “There is no significant difference in the uses of web-based learning among students of professional and general degree colleges in Mizoram” was rejected.

However, the mean rank (1107.11) of students of professional colleges was higher than the mean rank (925.46) of students of general degree colleges. This difference likely stemmed from the nature of professional college programs. Their practical curricula and focus on specialized skill development naturally lent themselves to web-based learning technologies. These institutions also tended to integrate online components, such as blended learning models, to boost flexibility,

accessibility, and engagement. In contrast, general degree colleges often relied more heavily on traditional classroom instruction, offering fewer opportunities for web-based learning.

4.7.5 Professional and General Degree College Students in Mizoram with reference to their Gender

The researcher employed the Mann-Whitney U Test to compare the uses of web-based learning among students of professional and general degree colleges in Mizoram according to their gender.

Table 4.52

Comparison of Uses of Web-based Learning among Professional and General Degree College Students in Mizoram with reference to their Gender

Group	N	Mean Rank	Asymptotic Significant	Decision	Sig. level – 0.05
Female	1031	945	0.541	Retain the H_0	NS*
Male	872	960.28			

**NS=Not Significant*

Table 4.52 showed the comparison of usage of web-based learning among students of professional and general degree colleges in Mizoram with reference to their gender. It revealed that the significant asymptotic value was 0.541, which was more than the critical value at the 0.05 levels. No significant difference was found in the usage of web-based learning among students of professional and general degree colleges in Mizoram with reference to their gender. Therefore, the null hypothesis stating “There is no significant difference in the uses of web-based learning among students of professional and general degree colleges in Mizoram with reference to their gender” was accepted.

However, the mean rank (960.28) of male students was higher than the mean rank (945) of female students among the professional colleges and general degree

colleges in Mizoram. Male students typically demonstrated greater confidence and capability when using web-based learning technologies compared to their female counterparts. This could be attributed to male students potentially being more proactive in seeking out professional development opportunities related to web-based learning. Such skill development through technology might have fostered a more positive outlook on web-based learning and its potential benefits. Consequently, it can be concluded that the use of web-based learning was higher among male students than female students in both professional and general degree colleges.

4.7.6 Professional and General Degree College Students in Mizoram with reference to their Discipline.

The researcher used the Kruskal-Wallis test to compare the uses of web-based learning among students of professional and general degree colleges in Mizoram, based on their discipline.

Table 4.53

Comparison of Uses of Web-based Learning among Professional and General Degree College Students in Mizoram with reference to their Disciplines

N	Mean	SD	df	Asymptotic significant	Decision	Sig. level - 0.05
1903	30.63	2.18	8	0.000	Reject the H ₀	S*

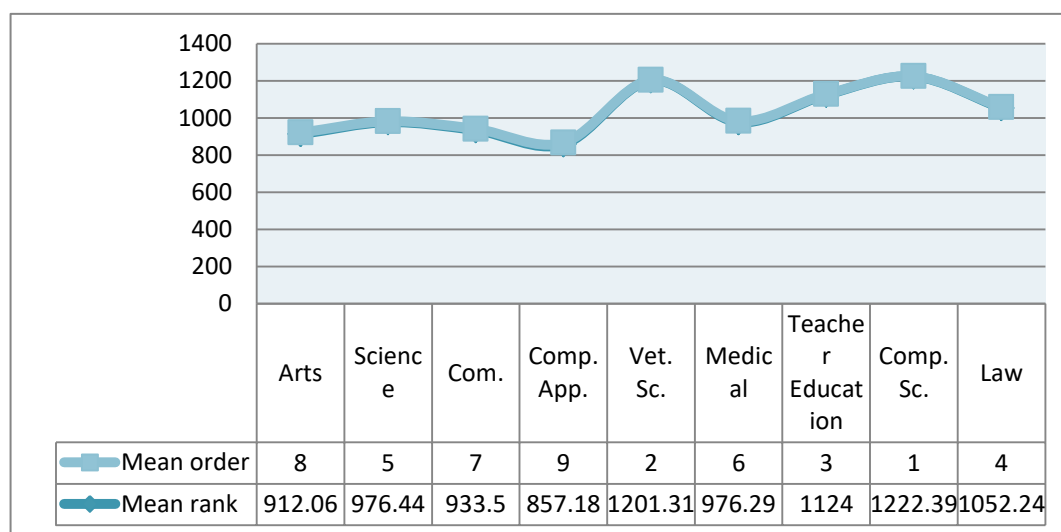
**S= Significant*

Table 4.53 illustrated the differences in web-based learning usage among students in professional and general degree colleges in Mizoram, categorized by their discipline. The asymptotic values, all at 0.000, fell below the critical value of 0.05. This indicated a significant difference in web-based learning usage based on discipline across these college types. Consequently, the null hypothesis, which stated "There is no significant difference in the use of web-based learning among students of professional colleges and general degree colleges in Mizoram with reference to their discipline," was rejected.

Table 4.54
Mean Ranks of Uses of Web-based Learning among Professional and General Degree College Students in Mizoram

Groups	N	Mean Rank	Rank order
Arts	1045	912.06	8
Science	271	976.44	5
Commerce	279	933.50	7
Computer Application	30	857.18	9
Veterinary Science	35	1201.31	2
Medical	64	976.29	6
Teacher Education	108	1124.00	3
Computer Science	42	1222.39	1
Law	29	1052.24	4
Total	1903		

Figure 4.5
Mean Rank and Mean Order of College Students on the Use of Web-based Learning



(Comparison of uses of web-based learning among students of professional colleges and general degree colleges in Mizoram with reference to their discipline)

The above table 4.54 and figure 4.11 showed the mean rank and mean order of the usage of web-based learning among the students of professional colleges and general degree colleges in Mizoram. It revealed that students of computer science scored the mean rank of 1222.39, followed by the students of - veterinary science (1201.31), teacher education (1124), law (1052.24), science (976.44), medical (976.29), commerce (933.44), arts (912.06) and computer application (857.18).

****** Pair-wise comparison of the perceptions of students of professional colleges and general degree colleges in Mizoram about web-based learning with reference to their discipline.

The study applies pair-wise comparisons to analyze multiple population means in pairs and determine whether they are significantly different from one another.

Table 4.55

Pair-wise comparison on Uses of Web-based Learning among Students of Computer Science and other Disciplines

Sl. No.	Discipline	Asymptotic Significant	Decision
1	Computer Application - Arts	0.586	NS*
2	Computer Application - Commerce	0.465	NS*
3	Computer Application - Medical	0.322	NS*
4	Computer Application - Science	0.254	NS*
5	Computer Application - Law	0.168	NS*
6	Computer Application - Teacher Education	0.017	S**
7	Computer Application - Veterinary Science	0.011	S**
8	Computer Application - Computer science	0.005	S**

*NS= Not Significant

**S=Significant

Table 4.55 showed a pair-wise comparison of the usage of web-based learning among students of computer application and other disciplines. It revealed

that the asymptotic value is more than the critical value at 0.05 levels - between the students' of - computer application and (0.586), computer application and commerce (0.465), computer application and medical (0.322), computer application and science (0.254) and, computer application and law (0.168). It was evident that no significant difference was found in the usage of web-based learning among students of computer application and other disciplines such as arts, commerce, medical, science, and law.

However, the asymptotic significant difference was less than the critical value at 0.05 levels between students of computer application and teacher education (0.017), computer application and veterinary science (0.011) and computer application and computer science (0.005); it indicated that there was a significant difference in the usage of web-based learning among the students of computer application with other disciplines such as teacher education, veterinary science and computer science. It could be assumed that all the students nowadays are keen to look forward to the usage of web-based technology. Despite the differences in their academic platform, the students' curiosity and interests enabled them to learn more, which could assist them in their educational and personal endeavours.

Table 4.56

Pair-wise comparison on Uses of Web-based Learning among Students of Arts and other Disciplines

Sl. No.	Discipline	Asymptotic Significant	Decision
1	Arts - Commerce	0.558	NS*
2	Arts - Medical	0.359	NS*
3	Arts - Science	0.082	NS*
4	Arts - Law	0.171	NS*
5	Arts - Teacher Education	0.000	S**
6	Arts - Veterinary Science	0.002	S**
7	Arts - Computer Science	0.000	S**

*NS= Not Significant

**S=Significant

Table 4.56 above revealed a pair-wise comparison of the usage of web-based learning for students of arts and other disciplines in Mizoram. It showed that the asymptotic value was more than the critical value at 0.05 levels among the students of arts and commerce (0.558), arts and medical (0.359), arts and science (0.082), and arts and law (0.171). It showed that no significant difference was found in the usage of web-based learning among the students of arts with other disciplines such as commerce, medical, science, and law.

At the same time, table 4.56 also showed that the asymptotic significance was less than the critical value at 0.05 levels among the students of arts and teacher education (0.000), arts and veterinary science (0.002) and arts and computer technology (0.000). It revealed that a significant difference was found in the usage of web-based learning among students of arts and teacher education, veterinary science and computer science. a significant difference was found in the usage of web-based learning among the students of arts, teacher education, veterinary science, and computer science, as students took advantage of web-based learning opportunities that aligned with their interests and skill levels, focusing on areas in need of improvement and allowing them to learn at their own pace in accordance with their discipline.

Table 4.57
Pair-wise comparison on Uses of Web-based Learning among Students of
Commerce and other Disciplines

Sl. No.	Discipline	Asymptotic Significant	Decision
1	Commerce - Medical	0.570	NS*
2	Commerce - Science	0.354	NS*
3	Commerce - Law	0.263	NS*
4	Commerce - Teacher Education	0.002	S**
5	Commerce - Veterinary Science	0.006	S**
6	Commerce - Computer Science	0.001	S**

*NS= Not Significant

**S=Significant

Table 4.57 showed a pair-wise comparison of the usage of web-based learning among students of commerce and other disciplines. It revealed that the asymptotic value was more than the critical value at 0.05 levels among students of commerce and medical (0.570), commerce and science (0.354), and commerce and law (0.263). It indicated that no significant difference was found in the usage of web-based learning among commerce students compared to the students of medical, science, and law.

Table 4.57, however, also showed that the asymptotic value was less than the critical value at 0.05 levels among students of commerce and teacher education (0.022), commerce and veterinary science (0.006) and commerce and computer science (0.001), which means that significant difference was found in the usage of web-based learning among commerce students and teacher education, veterinary science and computer science. Commerce, teacher education, veterinary science, and computer science hold different educational environments, and the requirement of their institution differs from one another. However, they consulted online technologies and made use of web-based learning in their particular field. That is why there was a significant difference in the use of web-based learning among the students of commerce, teacher education, veterinary science, and computer science.

Table 4.58

Pair-wise comparison on Uses of Web-based Learning among Students of Medical and other Disciplines

Sl. No.	Discipline	Asymptotic Significant	Decision
1	Medical - Science	0.998	NS*
2	Medical - Law	0.533	NS*
3	Medical - Teacher Education	0.085	NS*
4	Medical - Veterinary Science	0.049	S**
5	Medical - Computer Science	0.023	S**

*NS= Not Significant

**S=Significant

The pair-wise comparison of usage of web-based learning among students of medical and other disciplines was shown in table 4.58. It showed that the asymptotic value was more than the critical value at 0.05 levels among the students of medical and science (0.998) and medical and law (0.533), medical and teacher education (0.085); it was evident that no significant difference was found in the usage of web-based learning among the students of medical and science students, law students and teacher education.

However, the table also showed that the asymptotic value was less than the critical value at 0.05 levels among the students of medical and veterinary science (0.049), and between students of medical and computer science (0.023), which means that a significant difference was found in the usage of web-based learning among the students of medical and veterinary science, and between the students of medical and computer science. The cost-effectiveness, hands-on experience and practical training, global reach, personalization, customization, flexibility and accessibility were the main factors why there is a significant difference in the use of web-based learning among the students of medical, veterinary science, and computer technology.

Table 4.59

Pair-wise comparison on Uses of Web-based Learning among Students of Science and other Disciplines

Sl. No.	Discipline	Asymptotic Significant	Decision
1	Science - Law	0.475	NS*
2	Science - Teacher Education	0.017	S**
3	Science - Veterinary Science	0.021	S**
4	Science - Computer Science	0.006	S**

*NS= Not Significant

**S=Significant

The above table showed a pair-wise comparison of the usage of web-based learning among students of science and other disciplines. Table 4.59 showed that the

asymptotic significant differences was more than the critical value at the 0.05 levels between science students and law students, indicating that no significant difference was found in the usage of web-based learning among science students and law students.

Besides this, table 4.59 also showed that the asymptotic value was less than the critical value at 0.05 levels among the students of science and teacher education (0.017), science and veterinary science (0.021) and science and computer science (0.006). It was evident that a significant difference was found in the usage of web-based learning among science students and teacher education, veterinary science students and computer science students. The uses of web-based learning among the students of science, teacher education, veterinary science and computer science give more knowledge, improve their competencies needed in their respective chosen field and contribute much advancement and innovations, developing better quality in their particular work might be the reason why there was a significant difference among them regarding the use of web-based learning.

Table 4.60

Pair-wise comparison on Uses of Web-based Learning among Students of Law and other Disciplines

Sl. No.	Discipline	Asymptotic Significant	Decision
1	Law - Teacher Education	0.528	NS*
2	Law - Veterinary Science	0.275	NS*
3	Law - Computer Science	0.195	NS*

**NS= Not Significant*

Table 4.60 showed a pair-wise comparison in the uses of web-based learning among students of law and other disciplines. It revealed that the asymptotic value was more than the critical value at 0.05 levels among the law students and teacher education students (0.528), between law students and veterinary science students (0.275) and between law students and students of computer science (0.195). The

table signified that no significant difference was found in the usage of web-based learning among law students, teacher education students, veterinary science students, and computer science students. Students of law, teacher education, veterinary science and computer science leverage web-based learning effectively in their studies; integrating technology into their learning platforms enhances the quality of their education and helps them prepare for their future careers.

Table 4.61

Pair-wise comparison on Uses of Web-based Learning among the Students of Teacher Education, Veterinary Science and Computer Science

Sl. No.	Discipline	Asymptotic Significant	Decision
1	Teacher education-Veterinary Science	0.465	NS*
2	Teacher education- Computer Technology	0.320	NS*
3	Veterinary Science- Computer Technology	0.865	NS*

**NS= Not Significant*

The table above (table 4.61) illustrated the pair-wise comparison of web-based learning usage among students from teacher education, veterinary science, and computer technology. It revealed that the asymptotic value exceeded the critical value at the 0.05 level among the students of teacher education and veterinary science (0.465), between teacher education and computer science (0.320), and between veterinary science and computer science (0.865). Evidently, no significant difference was found in the usage of web-based learning among the students from teacher education, veterinary science, and computer science. The role of web-based learning as an essential aid for improving educational opportunities, enhancing resource accessibility, fostering collaboration, and promoting lifelong learning in diverse fields might have explained the lack of significant differences among the students of teacher education, veterinary science, and computer science regarding the usage of web-based learning.

CHAPTER – V

MAJOR FINDINGS, DISCUSSION AND CONCLUSION

5.1 Summary of the Study

5.1.1 Introduction

The introduction of technological innovation has revolutionized the traditional style of the teaching-learning process in the modern education system. Many institutions have positively embraced this technological advancement, although some institutions have yet to adopt these new techniques. However, the internet has brought about a massive change, resulting in a paradigm shift in the fundamental way in which learning takes place.

The Government of India has implemented several policies and schemes that prioritize the integration of ET to enhance the accessibility, quality and administration of education. These initiatives recommend the use of technology in education, and below are some of the major policies and schemes that support this approach.

- National Policy on Education (NPE) (1986) was a vital step in recognizing the role of technology in education.
- EDUSAT (2004) is a communication satellite meant for distance learning, built exclusively to serve the educational sector from the school level to higher education.
- NKC (2005) was formed to give impetus to empower educational institutions through high-speed networks and digital libraries and to produce an environment for optimal utilization of ICT in education.
- NMEICT (2009) was launched intending to provide affordable and quality education to all through the use of ICT. NMEICT focuses on initiatives like the National Programme on Technology Enhanced Learning (NPTEL),

Virtual Labs, and e-content development for undergraduate and postgraduate education.

- The Digital India Campaign (2015) was to transform India into a digitally empowered society and knowledge economy by focusing on the four vision areas:
 - Digital Infrastructure as a Core Utility to Every Citizen
 - e-Governance and Services on Demand
 - Digital literacy and empowerment of citizens
 - SWAYAM and SWAYAM Prabha provide online courses
- Atal Innovation Mission (AIM) (2016) focused on fostering innovation and entrepreneurship among students. It promotes the establishment of Atal Tinkering Labs (ATLs) in schools where students can learn through hands-on experience with technologies like 3D printing, robotics, and IoT (Internet of Things)
- NEP 2020 emphasizes the integration of technology at all levels of education. It promotes the use of digital tools for teaching, learning, assessment, and administration. It also envisions the establishment of a NETF to facilitate the exchange of ideas and best practices in technology-enabled education.
- Pradhan Mantri e-Vidya Program is an initiative taken during the COVID-19 pandemic. It aims to promote online education and digital learning platforms. It includes programmes like DIKSHA for digital content and online teacher training, as well as the provision of e-learning resources through television and radio.

Web-based learning has become an integral part of modern education, revolutionizing the traditional methods of teaching and learning. It offers a wide array of benefits, including increased accessibility, flexibility, and interactive learning opportunities for students. As technology continues to advance, it is essential to understand the rationale behind the integration of web-based learning in higher education and its impact on student learning outcomes. This study aims to delve into the various aspects of web-based learning, addressing its role in supporting traditional teaching methods, promoting essential digital literacy skills, and

contributing to the overall academic experience of students. Furthermore, this exploration seeks to identify the challenges and benefits associated with the implementation of web-based tools, paving the way for the development of best practices and guidelines for effective integration in academic settings. Overall, this research endeavours to shed light on the potential impact of web-based learning on student satisfaction, retention rates, and academic performance, ultimately enriching the educational experience for both educators and learners.

5.1.2 Rationale of the Study

Emerging technology is gradually covering the entire scope of human activities. Technological advancements have created a new field and are used for teaching and learning instead of traditional methods. The Internet has brought about a significant transformation, resulting in a paradigm shift in the basic way of learning. Also, the requirements of facilities in institutions differ from each other. The pandemic outbreak has also prompted the introduction of online learning, which is encouraged by faculty members to balance classroom activities and go beyond the constraints of a face-to-face setting. In this teaching paradigm, students can watch lecture videos prepared by their lecturers online, or in some institutions, teachers can also have live interactions online.

Today's educational environment is a complex interplay of goals, needs, completing requirements, pressures, and dwindling. In a country with vast diversity, Mizoram, an important geographical entity, positioned the 3rd highest Literacy rate in India with 91.3% on Census, 2011. The literacy rate may be highly positioned, but the State still needs more adequate facilities and services to have more manpower resources. Certain inherent challenges, such as the mountainous landscape and poor infrastructure, make development in this area challenging. The government must take steps to lessen the shortcomings of higher education in Mizoram. The Twelfth Five-Year Plan of the planning commissions has also laid emphasis on the quality of education in this region. It is necessary to integrate technological advancements into the teaching and learning process in order to stay up to date with the possibilities and demands that are always evolving.

Given the persuasive integration of technology into contemporary household and professional environments, children must acquire the requisite skills and knowledge for its effective utilization, fostering their academic and professional development. Taking this background into account, research on the application of computers and computer-aided technology, also known as information and communication technology, in the teaching and learning process is desperately needed by society. The appropriate implementation of technology across all educational levels will help to streamline classroom operations, enhance teacher professional development, improve access to education for underprivileged learners and improve educational planning, governance, administration and management.

5.1.3 Statement of the Problem

With a view to finding out Web-based learning resources provided to the teachers and students and resources accessed by teachers and students, of professional and general degree colleges in Mizoram, the present study was formulated as below:

Web-based Learning among Teachers and Students of Professional and General Degree Colleges in Mizoram

5.1.4 Operational Definition of Key Terms

- **Web-based Learning:** Web-based learning is the practice of delivering education globally through the use of computers, the internet, and various other technological tools, such as mobile phones. The internet makes it feasible to participate in email-based discussion groups, video conferences, and live lectures or video streaming.
- **Professional Colleges:** Professional Colleges are educational institutions that prepare students to work in a particular profession, practice, or business sector, often meeting the academic requirements for licensure or accreditation. Professional courses refer to a variety of education and training in a specific area. These courses provide a well-defined area in medicine,

engineering, management, Law, mass media, hospitality, computers, pre-service teacher training programmes, etc. In this study, the term 'professional course' refers to M.B.B.S., B.V. Sc. & A.H., B.Sc. Nursing, B. Pharma., B.Sc. MLT, B.Sc. RIT, B.C.A, L.L.B., and B.Ed.

- **General Degree Colleges:** General Degree Colleges are educational institutions that provide students with a breadth of knowledge across disciplines and depth into specific areas of personal interest. These include Bachelor of Arts (B.A.), Bachelor of Science (B.Sc.), Bachelor of Computer Application (COMPUTER SCIENCE), and Bachelor of Commerce (B.Com.).
- **Teachers:** A teacher is someone who provides education, instructs, and teaches. In this study, the term 'teachers' encompasses all educators working in degree colleges (undergraduate level) in Mizoram.
- **Students:** The term 'student' encompasses anyone enrolled in a school, college, or university. In this study, it refers to all individuals pursuing different degrees (undergraduate courses) in colleges in Mizoram.

5.1.5 Research Questions

In quantitative and qualitative studies, research questions help refine the purpose statement by concentrating on specific issues that aim to address. Researchers typically develop them before identifying the methods of the study, i.e. the types of data to be collected, analyzed, and interpreted in a study (Creswell, 2003).

After reviewing the relevant literature, the following questions were raised;

1. What are the types of web-based resources being provided to the teachers and students of professional and general degree colleges?
2. How are the ICT resources being utilized by the teachers and students?
3. How is web-based learning helpful in the teaching process?

4. How is web-based learning helpful in the learning process?
5. How do teachers of professional and general degree colleges differ in their perception of the use of web-based learning resources in the teaching-learning process based on their gender and discipline?
6. How do students of professional and general degree colleges differ in their perception of the use of web-based learning resources in the teaching-learning process based on their gender and discipline?
7. How do the teachers of professional and general degree colleges differ with regard to their perception and use of web-based learning?
8. How do the students of professional and general degree colleges differ with regard to their perception and use of web-based learning?
9. What are the areas of web-based services and practices which need to be improved?

5.1.6 Objectives of the Study

The objectives of the study were as follows.

1. To find out the web-based learning resources being provided to the teachers and students of professional and general degree colleges in Mizoram.
2. To find out the web-based learning resources being accessed by the teachers and students of professional and general degree colleges in Mizoram.
3. To find out the perception of teachers and students of professional and general degree colleges in Mizoram about web-based learning.
4. To find out the uses of web-based learning by the teachers and students of professional and general degree colleges in Mizoram.
5. To compare the perception of -
 - i. professional and general degree college teachers in Mizoram regarding web-based learning.
 - ii. professional and general degree college teachers in Mizoram with reference to their gender and discipline.
 - iii. professional and general degree college students in Mizoram regarding web-based learning.

- iv. professional and general degree college students in Mizoram with reference to their gender and discipline.
- 6. To compare the uses of web-based learning among-
 - i. professional and general degree college teachers in Mizoram
 - ii. professional and general degree college teachers in Mizoram with reference to their gender and discipline.
 - iii. professional and general degree college students in Mizoram
 - iv. professional and general degree college students in Mizoram with reference to their gender and discipline.
- 7. To give suggestions to the professional and the general degree college administration about the improvement of web-based learning resources.

5.1.7 Null Hypotheses (H_0)

A tentative solution to a problem that accounts for a set of facts and can be tested by further investigation is known as a hypothesis (Kerlinger, 2012). However, the null hypothesis (H_0) states that there is no true difference between the means of the two samples, and any variation between the sample means is purely coincidental and irrelevant, resulting from sampling fluctuations and random chance. The following hypotheses have been stated to realize the above objectives:

- i. There is no significant difference in the perception of teachers of professional and general degree colleges in Mizoram about web-based learning.
- ii. There is no significant difference in the perception of teachers of professional and general degree colleges in Mizoram about web-based learning with reference to their gender.
- iii. There is no significant difference in the perception of teachers of professional and general degree colleges in Mizoram about web-based learning with reference to their discipline.
- iv. There is no significant difference in the perception of students of professional and general degree colleges in Mizoram about web-based learning.

- v. There is no significant difference in the perception of students of professional and general degree colleges in Mizoram about web-based learning with reference to their gender.
- vi. There is no significant difference in the perception of students of professional and general degree colleges in Mizoram about web-based learning with reference to their discipline.
- vii. There is no significant difference in the use of web-based learning among teachers of professional and general degree colleges in Mizoram.
- viii. There is no significant difference in the use of web-based learning among teachers of professional and general degree colleges in Mizoram with reference to their gender.
- ix. There is no significant difference in the use of web-based learning among teachers of professional and general degree colleges in Mizoram with reference to their discipline.
- x. There is no significant difference in the use of web-based learning among students of professional and general degree colleges in Mizoram.
- xi. There is no significant difference in the use of web-based learning among students of professional and general degree colleges in Mizoram with reference to their gender.
- xii. There is no significant difference in the use of web-based learning among students of professional and general degree colleges in Mizoram with reference to their discipline.

5.1.8 Method of the Study

The research employed the descriptive survey method to collect data on the status of web-based learning in various professional and general degree colleges in Mizoram. The study primarily focused on quantitative research to determine the current state of web-based learning in these institutions.

5.1.9 Population

The population of the study consisted of all the teachers and students of professional colleges and general degree colleges in Mizoram.

5.1.10 Sample and Sampling Technique

A multi-stage sampling technique was employed to select participants, ensuring every sample unit (teachers and students) had an equal probability of being selected from the population. Multi-stage sampling, a more sophisticated form of cluster sampling, involves two or more stages of sample selection. In simple terms, in multi-stage sampling, large clusters of population were divided into smaller clusters in several stages in order to make primary data collection more manageable.

A total of 25 teachers were selected from the professional colleges of Mizoram. From institutions such as RIPANS(Bachelor of Optometry, Bachelor in Pharmacy, Bachelor of Science in Nursing, Medical Laboratory Science, Master in Pharmacy, Master of Science in Nursing, Master in Medical Laboratory Science, and Doctor of Philosophy), IASE (Teacher Education Programme- Bachelor of Education, Master of Education, and Doctor of Philosophy), Government Mizoram Law College (Law), Veterinary Science and Animal Husbandry College (Animal Breeding and Genetics, Animal Reproduction, Gynaecology and Obstetrics, Krishi Vigyan Kendra, Livestock Production and Management, Animal Nutrition, Instruction Livestock Farm Complex, Livestock Product Technology, Veterinary Anatomy and Histology, Veterinary and Animal Husbandry Extension, Veterinary Microbiology, Veterinary Pathology, Veterinary Physiology & Biochemistry, Veterinary Surgery and Radiology, Veterinary Medicine, Veterinary Parasitology, Veterinary Pharmacology and Toxicology, and Veterinary Public Health and Epidemiology), and NEILIT (Diploma in Computer Science & Engineering, Diploma in Electronics and Telecommunication Engineering, Bachelor of Computer Application, and Master of Computer Application. 'A' LEVEL, 'O' LEVEL, and MAT 'O') 10 male teachers and 15 female teachers. 278 students (132 male and 146 female) constituted the selected sample. The sample consisted of 64 students from

medical, 108 students from teacher education, 29 students from law, 35 students from veterinary science, and 42 students from computer science. For some of the professional courses, only one institution was available. Therefore, the particular institution was automatically selected to ensure adequate representation from each subset of the population.

The researcher further categorised general degree colleges by their offered program, such as arts, science, commerce and computer application. An appropriate number of colleges from each category were randomly selected based on their population while collecting data for the study. The selected samples of teachers from general degree colleges were 82 teachers, with 43 male and 39 female teachers. Out of 1625 students, there were 740 male students and 885 female students. The total number of selected students for the present research from different general degree colleges studying in various disciplines. The sample consisted of 1045 students from the arts stream, 271 students from the science stream, 279 students from the commerce stream and 30 students from the computer application stream.

5.1.11 Tools Used for Data Collection

The investigator developed 7 tools for collecting the relevant data, which are mentioned below:

1. Checklist-cum-observation Schedule for the Available Resources related to Web-based Learning in the Institution
2. Questionnaire for Teachers to Investigate Accessibility of Web-Based Learning
3. Questionnaire for Students to Investigate Accessibility of Web-Based Learning
4. Perception of College Teachers about Web-Based Learning
5. Perception of College Students about Web-Based Learning

6. Usage of Web-Based Learning by College Teachers in the Institution

7. Usage of Web-Based Learning by College Students in the Institution

5.1.12 Validity and Reliability

Content validity ensures the extent to which a measuring instrument covers a representative sample of the behaviours it aims to measure (Jackson, 2009). In simpler terms, it can be said that it is about how well the instrument measures what it's supposed to measure. An instrument/tool with good content validity thoroughly covers all aspects of the domains. Ensuring content validity involves expert review of the instrument's items to judge their relevance and representativeness. Therefore, the drafted tools were given to seven (7) experts for content validation. Taking the experts' opinions into consideration, modifications were made to some items, and some were dropped from the final version of the tools.

The test-retest method, which assesses the consistency of a measurement (Jackson, 2009), was administered to evaluate the reliability of the study. This involved finding a correlation between two sets of scores or equivalent tests from the same group. The coefficient of correlation was interpreted using Pearson's Product-Moment Correlation (Garrett, 2009).

- Reliability of correlation coefficient indices for Web-based Learning Accessed by Teachers of Professional and General Degree Colleges – 0.73
- Reliability of correlation coefficient indices for Web-based Learning Accessed by Students of Professional and General Degree Colleges – 0.62
- Reliability of correlation coefficient indices for Perception of Teachers of Professional and General Degree Colleges about Web-based Learning – 0.72
- Reliability of correlation coefficient indices for Perception of Students of Professional and General Degree Colleges about Web-based Learning – 0.69

- Reliability of correlation coefficient indices for Uses of Web-based Learning among Teachers of Professional and General Degree Colleges – 0.67
- Reliability of correlation coefficient indices for Uses of Web-based Learning among Teachers of Professional and General Degree Colleges – 0.69

5.1.13 Procedure of Data Collection

1. After the random selection of the colleges, the researcher visited the computer centre or ICT centre to get information about the availability of web-based learning resources with the help of a checklist cum observation schedule.
2. Henceforth, for the collection of data from teachers and students, proper and clear instruction was given before administering the questionnaires and rating scales. They were informed about the confidentiality of their profile and responses to the question. The rationale of the research was explained to them with full understanding, and they were encouraged not to hesitate to give answers or their opinions. After giving all the necessary instructions, a tool was distributed, and the respondents started giving responses.

5.1.14 Statistical Techniques for Data Analysis

The data was analyzed by using MS Excel and SPSS. Statistical techniques such as percentage, and frequency were used to analyze data for research objectives 1 and 2. To compare two or more groups, as the data was on an ordinal level; the Mann-Whitney U test and the Kruskal-Wallis test were used.

5.2 Major Findings of the Study

5.2.1 Findings regarding Web-Based Learning Resources provided to the Teachers and Students of Professional Colleges in Mizoram

1. VSAH had a computer laboratory with 20 sets of computers. The college was equipped with internet connectivity and VSAT. The photocopier machine was accessible; no other resources were reported as available during the time of data collection, providing 2Mbps of broadband internet and Voice Over Internet Protocol (VoIP) Connectivity.
2. NEILIT, formerly known as DOEACC, had more than 200 computers, 20 classrooms were designed as smart classrooms, the institution had 2 video conferencing rooms, and resources such as printers (2), photocopier machines (3) were accessible. The institution had internet and intranet connectivity in VSAT, NKN, Radio link, BSNL, and NextCom were the available networks. All classrooms were ergonomically furnished, and projectors were installed. NEILIT had subscribed to the Online IEEE Xplore Digital Library.
3. IASE had a computer centre along with 20 sets of computers. The 10 projectors were installed for educational purposes. An INFLIBNET service was available, and a web-based language teaching platform like SANAKO was available in the institution. Google Classroom and Zoom were the most used apps for academic interaction during the COVID-19 pandemic.
4. GMLC had a computer room along with 20 sets of computers and a language laboratory having 10 sets of computers. Internet connectivity was available, and each classroom had wall-mounted projectors.
5. RIPANS had an e-resources centre, along with 20 sets of computers. Web-OPAC interface was available, library software like KOHA was accessible, and Radio Frequency Identification (RFID) was also provided in the library.

5.2.2 Findings regarding Web-based Learning Resources provided to the Teachers and Students of General Degree Colleges in Mizoram

1. Government Saiha College had internet connectivity for faculty; smart classrooms were under construction during the time of data collection, which was under the RUSA project. The computer centre and language laboratory were available with 10 sets of computers each, and 10 laptops were available for faculty. During the COVID-19 pandemic, Google Meet and Zoom were the most common platforms used for academic interaction, and e-resources were under process for accessibility at the time of data collection. One (1) projector was installed in the college seminar hall.
2. Government Lawngtlai College computer center-cum-e-resource centre was available, having 15 sets of computers. Other resources like projectors (8), television (1), digital camera (2), printers (5), photocopier machine (1), scanner (1) were available in the institution. Google Meet, Zoom, Google Classroom and WhatsApp were used for academic purposes during the COVID-19 pandemic. A memorandum of understanding was signed between the Jio Company and the college to link the internet. In this connection, a Jio signal tower was installed, enabling all staff members and students to access the internet for free.
3. Government J. Buana College had a computer laboratory having 20 sets of computers. Wi-fi was connected in each classroom. The institution had 2 smart classrooms, 6 projectors, and a seminar hall equipped with digital resources. The N-list was accessible in the institution. Google Meet, Google Forms, and WebEx were the most used apps for academic purposes during the COVID-19 pandemic.
4. Lunglei Government College had a computer room with 15 sets of computers. Internet connectivity was available in which N-list was accessible. E-resources such as projectors (13), televisions (2), digital camera (1), printers/scanners (3), and photocopier machines (2) were provided. During the COVID-19 pandemic, various software applications like Zoom, Google Meet, Google Classroom and WebEx were used for academic purposes.

5. Government Kolasib College had a computer centre with 50 sets of computers. Internet connectivity was available in which INFLIBNET and N-List were accessible. There were 3 projectors in the institution. Specific software such as SANAKO, ORACLE 10G, 8085 Simulator, VISUAL BASIC 2010, Ubuntu and Turbo C were provided to the teachers and students of Government Kolasib College.
6. Government Champhai College had an Internet resource centre having 15 sets of computers. The college had a computer science laboratory having 30 sets of computers and a geography laboratory having 10 computers. Core classrooms (10) were well furnished and had a smartboard. Internet connectivity was available, and INFLIBNET and N-List were accessible. Specific software such as Oracle, VB, Turbo C, C++, Tally, Emulator and Ubuntu were provided to the teachers and students. Application software like Google Meet and Google Classroom were used for educational purposes during the COVID-19 pandemic.
7. Government Serchhip College had an internet resource centre having 45 sets of computers, there were 10 laptops and 11 projectors; the college had 6 smart classrooms. Internet connectivity was available, in INFLIBNET and N-List were accessible. Academic platforms like the National MOOC platform, SWAYAM and NPTEL were provided in the institution. Google Classroom, Google Meet, Zoom, YouTube and WhatsApp were the most used application software during the COVID-19 pandemic. The teachers and students of Government Serchhip College used specific software such as SUSE, Kubuntu, Ubuntu, Linux, Oracle Studio and SANAKO.
8. Government T. Romana College had a computer centre having 18 sets of computers, and a language laboratory having 20 computers. Each department in the college had a laptop (8). There were 10 projectors, 1 television, 6 printers, 2 photocopier machines and 2 scanners. Internet connectivity was available in which INFLIBNET and N-List were accessible. Google Meet and WebEx were the most-used application software during the COVID-19 pandemic.

9. Government Aizawl College had an internet resource centre and a language laboratory set up, having 20 computers in each centre. There were 9 laptops provided for each department, 7 printers and 20 projectors. Internet connectivity was available through which INFLIBNET, N-List, National Digital Library of India were accessible. Specific software, Tally was used by the commerce department.
10. Government Hrangbana College had an internet resource centre that was set up having 30 sets of computers, and a language laboratory was also available having 20 sets of computers; SANAKO learning software was used in the language laboratory. Each classroom had projectors (20). Internet connectivity was available in which INFLIBNET, N-List, National Digital Library of India were accessible. Various software applications such as Google Classroom, Google Meet and Zoom were used during the COVID-19 pandemic for educational purposes.
11. Pachhunga University College had a computer centre and a language laboratory having 30 sets of computers in each. Internet connectivity was available in which N-List and Internet Cell of Library were accessible. Specific software like Tally was used. There were 38 projectors in the institution. Google Classroom and Zoom were used during the COVID-19 pandemic.
12. Government Zirtiri Residential Science College had a computer centre-cum-language laboratory having 20 sets of computers. Other than that, there were 88 computers and 19 projectors available for academic purposes. Internet connectivity was available, through which INFLIBNET and N-List were accessible. SANAKO software was provided in the language laboratory.

5.2.3 Discussion regarding Web-Based Learning Resources provided to the Teachers and Students of Professional and General Degree Colleges in Mizoram

The primary aim of this study was to assess the availability of web-based learning resources in professional and general degree colleges in Mizoram. The researcher discovered significant disparities in the availability of web-based learning resources between the two types of colleges. Variations in locality, student population, and the range of disciplines offered by the institutions, were identified as the primary reasons for the differences in resource availability in the institutions.

It could be discussed that there were computer centres or e-resource centres in all professional and general degree colleges. However, the capacity of e-resource centres and the availability of computers were very limited. All the institutions had internet access, which allowed e-resources, specialized software, and other technical assistance to be accessible following the requirements of the various institutions. Connectivity and infrastructure-related issues needed to be sorted out in order to motivate teachers and students to make use of web-based resources. The above finding was similar to the findings of Pandey et al. (2016), who stated that online materials and infrastructures were requisite to encourage students to study further. Gadgets like projectors, photocopier machines, and printers were available for educational purposes in the majority of institutions. However, other institutions, such as professional colleges and general degree colleges, did not have sufficient e-resources. The finding was supported by the study of Jude and Dankaro (2012), who expressed that teacher educators could not access instructional development and insisted on having well-equipped ICT resources. The overall results also showed that not all the e-resources were satisfactory and readily available, which is the reason why teachers and students could not access the internet in times of need. This finding was in agreement with the findings of Uma & Kavitha (2021). The investigators

found that each institute was trying to improve its web-based facilities to catch up with the technological advancements globally, which was similar to the findings of Pande et al. (2016).

5.2.4 Findings regarding Web-Based Learning Resources accessed by the Teachers of Professional and General Degree Colleges in Mizoram

- 1) The majority (64%) of teachers from professional colleges used a computer or laptop for more than 10 years, while 51% of teachers from general degree colleges had used one for over 10 years. In total, 54% of the college teachers in Mizoram had used a computer or laptop for over a decade.
- 2) Among the professional colleges, the majority (92%) of the teachers had used a smartphone for more than 5 years, while 84% of the teachers from the general degree colleges had also used a smartphone for more than 5 years. Overall, 86% of college teachers in Mizoram had used smartphones for more than 5 years.
- 3) In professional colleges, the majority (88%) of teachers used the internet to update their knowledge, compared to 87% in general degree colleges. Thus, it could be concluded that 87% of college teachers in Mizoram relied on the internet for knowledge updates. The research included options such as recreational use, lecture preparation, knowledge updates, and research work.
- 4) A majority (90%) of the teachers from professional colleges had access to the internet 'every day'; simultaneously, 89% of the teachers from general degree colleges had access to the internet 'every day'. Therefore, it means that the majority (90%) of the college teachers in Mizoram had access to the internet every day.
- 5) Among the professional college teachers in Mizoram, the majority (92%) accessed the network in the institution, while the majority (89%) of the general degree college teachers did the same. Thus, it was clear that the majority (94%) of the college teachers in Mizoram used their institutional network.

- 6) All the professional college teachers used the WhatsApp social media platform, while 96% of general degree college teachers preferred it. It can be stated that WhatsApp was the most used (97%) social media platform by college teachers in Mizoram. Other options included Instagram, Facebook, YouTube, Twitter, and Telegram.
- 7) To get information related to teaching and other areas, Wikipedia was the website that teachers frequently visited, with 64% of professional college teachers and 45% of general degree college teachers. Thus, Wikipedia was the most visited (50%) website and academic platform by college teachers in Mizoram. Other platforms listed were LinkedIn, Academia.edu and ResearchGate.
- 8) Google Meet was the most used (92%) app for online academic interaction by teachers of professional colleges, while Zoom was the most used (89%) app for online academic interaction by teachers of general degree colleges. However, Zoom was the most used (89%) app for online academic interaction by college teachers in Mizoram. Other options included Google Classroom and WebEx.
- 9) The majority (68%) of professional college teachers did not have personal online accounts beyond social media, and 59% of general college teachers lacked such accounts. Thus, the majority (61%) of the college teachers in Mizoram did not maintain personal online spaces outside social networking sites.
- 10) All the professional college teachers used the Google search engine, and 99% of the general degree college teachers also used the Google search engine. Hence, nearly all (99%) of the college teachers in Mizoram used the Google search engine to explore the internet. Other search engines that were among the possible choices for this question were Yahoo and UC Browser.
- 11) A majority (76%) of the teachers from professional colleges learned about online sources from media outlets, compared to 70% of general degree college teachers. It can be concluded that the majority (71%) of the college teachers in Mizoram discovered online resources from the media. Options for

awareness of online sources included friends and colleagues, family and institutions.

- 12) The majority (76%) of the professional college teachers and general degree college teachers stated that their institution organized an orientation programme on the use of web-based learning or ICT; concurrently, the majority (76%) of the college teachers in Mizoram stated that their institution organized an orientation programme on web-based or ICT.
- 13) The majority (52%) of professional college teachers rated their computer knowledge as 'average'. The same was found with general degree college teachers (54%). In total, the majority (53%) of college teachers considered their computer skills 'average'.
- 14) The majority (76%) of the teachers from professional colleges had a 'medium' ability in handling web-based facilities or ICT, while 73% of the teachers from general degree colleges also shared this level. It was found that the majority (74%) of college teachers in Mizoram had a 'medium' ability to handle web-based facilities or ICT for teaching-learning purposes.
- 15) The majority (56%) of the professional college teachers preferred the conventional type of teaching; 60% of the general degree college teachers preferred the conventional type of teaching, and the majority (59%) of college teachers in Mizoram preferred the conventional or traditional type of teaching rather than modern or contemporary teaching, i.e. use of ICT or web-based facility.
- 16) All the professional college teachers 'always' used MS Office; 80% of the general college teachers 'always' used MS Office, and the majority (85%) of the college teachers in Mizoram 'always' used MS Office application software. The options provided for this question included media players, accounting software, web conferencing, anti-virus software, graphic design software, and digital audio workstations.
- 17) The majority (64%) of the professional college teachers were 'excellent' in using MS Office; 57% of the general college teachers were 'good' in using MS Office, and the majority (50%) of the college teachers in Mizoram had 'excellent' proficiency in using MS Office.

- 18) The majority (92%) of the teachers from the professional colleges ‘always’ used Windows system software; 79% of the teachers from general degree colleges ‘always’ used Windows. So, it was clear that the majority (82%) of the college teachers in Mizoram ‘always’ used Windows. Linux, iOS, Android, and Macintosh were also included in the given preferences.
- 19) The majority (56%) of the teachers from professional colleges were ‘good’ in using Windows; 61% of the teachers from general degree colleges shared this proficiency; and the majority (60%) of the college teachers in Mizoram had ‘good’ proficiency in using Windows system software.
- 20) The majority (80%) of the teachers from professional colleges attended an educational online programme or live telecast lectures; 83% of the teachers from general degree colleges attended the educational online programme, as a result, 82% of the college teachers in Mizoram attended online educational programme or live telecast lectures in their institutions.
- 21) Among the professional college teachers, 36% of them rated their web-based facilities as ‘inadequate’, and another 36% considered them ‘moderate’, 54% of the general college teachers rated them ‘moderate’. However, 50% of the college teachers in Mizoram described their web-based facilities as ‘moderate’.
- 22) Out of 25 professional college teachers, the majority (88%) of teachers had network or internet connection failure during online classes; out of 82 general college degree teachers, 88% of them had network or internet connection failure during online classes. Among the 107 college teachers in Mizoram, 88% of teachers had experienced network or internet connection failures during online classes. Motivating students, tracking students’ work or assignments, lack of computer literacy skills, problems in handling online interfaces, and time management were included among the problems faced during online classes.
- 23) The majority (72%) of the teachers from professional colleges preferred hardcopy submissions for assignments, 66% of the general degree college teachers wanted students’ assignments in hardcopy, and the majority (67%) of the college teachers in Mizoram wanted assignments in hardcopy.

- 24) The majority (64%) of professional college teachers conducted online classes ‘a few times in a week’ during the pandemic; 65% of the general degree college teachers took ‘a few times a week’ online classes, and 65% of the college teachers in Mizoram took online classes ‘a few times a week’ during the COVID-19 pandemic.
- 25) Among the professional college teachers, 40% were ‘slightly satisfied’ with online classes during the pandemic; 50% of the general degree college teachers were ‘satisfied’ with online classes. Out of the 107 college teachers in Mizoram, 47% of teachers expressed ‘satisfied’ with taking online classes during the COVID-19 pandemic.
- 26) The majority (64%) of the professional college teachers were ‘very satisfied’ with the coverage of courses and 54% of the teachers from general degree colleges were also ‘very satisfied’. The majority (66%) of the college teachers were ‘very satisfied’ with covering their course or syllabus during the COVID-19 pandemic.

5.2.5 Discussion regarding Web-Based Learning Resources accessed by the Teachers of Professional and General Degree Colleges in Mizoram

In Mizoram, the majority of college teachers used computers or laptops for over 10 years and smartphones for more than 5 years. This aligned with the findings of Puspitasari et al. (2018), which highlighted the role of technology, such as computers, smartphones, and internet connections, for web-based learning tools. The college teachers in Mizoram accessed the internet daily to update their knowledge and prepare for lectures, leisure activities, and research work, similar to the findings of Pande et al. (2016). WhatsApp was the most popular social media platform among college teachers in Mizoram, followed by YouTube, Facebook, Instagram, Telegram, and Twitter. These preferences for social media as a blended learning tool corporate Selvaras (2019) findings on technology adoption in open and distance learning contexts within Sri Lanka. Wikipedia was the most visited academic platform, though it fell short of fully meeting educational demands.

Other platforms like ResearchGate, Academia.edu, and LinkedIn were less frequently used. The COVID-19 pandemic led to the introduction of online academic interaction between teachers and students, with Zoom being the most used online platform for academic interaction, followed by Google Meet, Google Classroom, and WebEx. Almost all teachers used the Google search engine to explore the internet, and many learned about online sources through the media. While most teachers rated their computer proficiency as 'average' and their web-based facility handling as 'medium', orientation programs on ICT use were conducted, echoing Kakar and Majula (2022) emphasis on training needs. The result also showed that most teachers preferred conventional or traditional types of teaching to modern or contemporary teaching i.e. use of ICT or web-based facilities for teaching. MS Office was the most popular application software used by teachers, and Windows was the most common system software used by them. It was discovered that teachers lacked advanced expertise in utilizing the application software and system software, as they were not familiar with them. This finding also concurred with the findings of Thangamani and Nagavalli(2017), stating that student teachers had an average attitude towards ICT but did not have proficiency in using it. The majority of the teachers participated in online educational programmes or live telecast lectures at their respective colleges. Half of the respondents evaluated their web-based facilities as moderate. There are many problems faced during online classes - motivating students, tracking students' work or assignments, teachers lacking computer literacy skills, network or internet connection failures, handling online interfaces, and time management. This particular finding concurred with the findings of Ayoub et al. (2020) in their study relating to the flexibility and capacity for learning as web-based learning was self-paced. The majority of the teachers preferred to get assignments from students in hard copy. The COVID-19 pandemic hinders regular class engagement. As a result, many teachers participated in online classes a few times a week, and many expressed satisfactions with how the courses covered their subject matter and

syllabus. The result indicated that effective training on the use of web-based resources or ICT needs to be done for college teachers.

5.2.6 Findings regarding Web-Based Learning Resources accessed by the Students of Professional and General Degree Colleges in Mizoram

- 1) Out of the 278 students from the professional colleges, the majority (77%) owned a computer or laptop, whereas, among the 1625 general degree college students, 53% did not have a computer or laptop. However, the majority (51%) of college students in Mizoram owned a computer or laptop.
- 2) Among the professional college students, 45% of them had used a computer or laptop for over 1-5 years; 58% of the students in the general degree colleges had used a computer or laptop for over 1–5 years. The majority (56%) of college students in Mizoram had used computers or laptops for 1-5 years.
- 3) Out of 278 students from the professional colleges, 62% had used a smartphone for more than 5 years, out of 1625 students from the general degree colleges, 48% of them had used a smartphone for more than 5 years. Out of the 1903 students, 50% of the college students of Mizoram had used smartphones for more than 5 years.
- 4) Out of the 278 students from professional colleges, the majority (80%) of them used the internet for educational purposes; meanwhile, out of the 1625 students from the general degree college, the majority (74%) of them used the internet for updating their knowledge. Thus, out of the 1903 college students, 75% of them used the internet to update their knowledge.
- 5) The majority (89%) of the professional college students accessed the internet ‘every day’, 71% of the general degree college students accessed the internet ‘every day’, and the majority (74%) of college students in Mizoram accessed the internet ‘every day’.
- 6) The majority (61%) of professional college students did not access the network in their institutes; 65% of general degree college students did not

access the network in their institutes, and the majority (65%) of college students did not access the network from institutions.

- 7) WhatsApp was the most used (97%) social media platform for online academic interaction by professional college students; 91% of the general degree college students used WhatsApp social media for academic interaction, and WhatsApp was the most used (92%) social media for academic interaction by college students in Mizoram.
- 8) Wikipedia was the most visited (51%) website by professional college students for educational purposes; at the same time Wikipedia was the most visited (27%) website by general degree college students for educational purposes, and again, among the college students in Mizoram, Wikipedia was the most visited (30%) website for educational purposes.
- 9) Google Meet was the most used (75%) app for online academic interaction by students of professional colleges, while Zoom was the most used (66%) app for online academic interaction by students of general degree colleges. However, Zoom was the most used (66%) app for online academic interaction by college students in Mizoram.
- 10) The majority (91%) of the professional college students did not have a personal online account other than social networking sites; 76% of the general college students also did not have a personal online space. Thus, the majority (78%) of the college students in Mizoram did not have personal online space other than social networking sites.
- 11) The majority (99%) of the professional college students used the Google search engine, and 99% of the general degree college students also used the Google search engine. Almost all (99%) of the college students in Mizoram used the Google search engine for exploring the internet.
- 12) The majority (76%) of the students from professional colleges came to know online sources from media outlets; 60% of the students from general degree colleges also came to know online sources from media outlets. The majority (61%) of the college students in Mizoram learned about online resources from the media.

- 13) The majority (67%) of the students from the professional colleges stated that their institution organized an orientation programme on the use of web-based learning or ICT. Meanwhile, among general degree colleges, 75% of them stated that their institution organized an orientation programme on web-based, and the majority (74%) of the college students in Mizoram responded that their institution organized an orientation programme on the use of web-based or ICT.
- 14) Among the professional college students, 55% of them had 'average' proficiency in using a computer; among the general degree college students, 44% of them had 'average' proficiency in using a computer. Thus, out of the 1903 college students in Mizoram, 46% of them had 'average' proficiency in using a computer.
- 15) Among the professional college students, 67% of them had 'medium' ability in handling web-based facilities or ICT for teaching and learning; 77% of the general degree college students had 'medium' ability in handling web-based facilities or ICT. In the meantime, the majority (76%) of the college students had 'medium' ability in handling web-based facilities or ICT in teaching and learning.
- 16) The majority (57%) of professional college students preferred modern or contemporary types of learning, while the majority (61%) of the general degree college students preferred conventional or traditional types of learning. However, the majority (58%) of the college students in Mizoram preferred a conventional or traditional type of learning.
- 17) The majority of students used MS Office 'sometimes'. In terms of percentage, 53% of professional college students, 51% of general degree college students and out of the 1903 college students in Mizoram, 51% of students used MS Office 'sometimes'.
- 18) The majority (61%) of the professional college students were 'good' in using MS Office; 55% of the general degree college students were 'good' in using MS Office, and the majority (56%) of college students in Mizoram had 'good' proficiency in using MS Office.

- 19) The majority (60%) of the students in the professional college ‘always’ used Windows, while 44% of the general college students ‘sometimes’ used Windows. Among the 1903 college students in Mizoram, 43% used Windows ‘sometimes’.
- 20) The majority (55%) of the professional college students were ‘good’ in using Windows system software; 48% of the general degree college students were also ‘good’ in using Windows. Among the 1903 college students in Mizoram, 49% of students had ‘good’ proficiency in using Windows.
- 21) The majority (74%) of the students from the professional college attended educational online programmes or live telecast lectures; 92% of the students from the general degree college attended educational online programmes, and the majority (89%) of the college students in Mizoram attended educational online programmes or live lectures in their institutions.
- 22) The majority (58%) of the professional college students rated their web-based facilities as ‘moderate’, 67% of the general degree college students rated their web-based facilities as ‘moderate’, and the majority (65%) of the college students from both colleges rated the web-based facilities in their institutions as ‘moderate’.
- 23) Out of 278 students from the professional college, the majority (72%) of them experienced network or internet connection failure during online classes; out of 1625 general college degree students, 74% of them experienced network or internet connection failure during online classes. Among the 1903 college students in Mizoram, 74% of teachers had experienced network or internet connection failures during online classes. Motivating students, tracking students’ work or assignments, lack of computer literacy skills, problems in handling online interfaces, and time management were among the problems faced during online classes by college students.
- 24) The majority (55%) of the students from professional colleges preferred submitting their assignments in softcopy, 57% of the general degree college students to submit in softcopy, and the majority (57%) of the college students in Mizoram wanted to submit their assignments in softcopy.

- 25) The majority (62%) of the professional college students attended their classes ‘every day’ during the pandemic; 72% of the general degree college students also attended online classes ‘every day’, and 70% of college students of Mizoram attended online classes ‘every day’ during the COVID-19 pandemic.
- 26) Among professional college students, the majority (45%) were ‘slightly satisfied’ with online classes during the pandemic, while the majority of general degree college students (39%) were ‘satisfied’ with online classes. Though it was the majority, out of the 1903 college students in Mizoram, only 38% of them were ‘satisfied’ with taking online classes during the COVID-19 pandemic.
- 27) Among the students at professional colleges, 38% of them were ‘satisfied’ with the coverage of courses, 40% of the students from general degree colleges were also ‘satisfied’, and 40% of the college students in Mizoram were ‘satisfied’ in covering their course or syllabus during the COVID-19 pandemic.

5.2.7 Discussion regarding Web-based Learning Resources accessed by the Students of Professional and General Degree Colleges in Mizoram

This study focused on the usage of web-based learning resources among students in professional and general degree colleges in Mizoram. The majority of students owned computers or laptops, which they had been using for 1 to 5 years, and half of the respondents had been using smartphones for over 5 years. Most college students accessed the internet daily to update their knowledge and being engaged in educational and recreational activities, entertainment, and in search of job. Many students accessed to campus networks. The most used social media platform for online academic interaction had been WhatsApp, followed by YouTube, Instagram, Facebook, Twitter, and Telegram. Engaging in certain social media activities had had a positive impact on their studies, which was consistent with the findings of Schindler et al. (2017), indicating a higher return on academic results. For

educational purposes, Wikipedia had been the primary source of information or teaching, but its open-editing nature meant it was not considered a valid academic site. To address this, an orientation program on ethical teaching using ICT needed to introduce to help teachers identify reliable sources. Other websites that were used for educational purposes included Academia.edu and ResearchGate. During the COVID-19 pandemic, Zoom was the most popular app used by students, followed by Google Meet, Google Classroom, and WebEx. The majority of students did not have personal online spaces and preferred the Google search engine. Many students learned about online sources from the media and mentioned that their institutions organized orientation programs on web-based or ICT. However, they only had average basic computer knowledge for their educational assistance. College students in Mizoram also stated that they had a moderate ability to handle web-based facilities or ICT for teaching and learning. Most students preferred conventional learning over modern or contemporary learning, such as the use of ICT or web-based resources. They were familiar with the MS Office application software and proficient in using it, as well as familiar with the Android system software. Most college students attended online educational programs or live telecast lectures at their respective institutions and rated the web-based facilities provided by their colleges. During online classes, students encountered issues such as network or internet connection failures, lack of motivation, and time management, which were also common setbacks found in the study of Dost et al. (2020). Most students preferred to submit their assignments using soft copies. During the COVID-19 pandemic, regular classes continued using different online modes, and the majority of the students attended online classes every day and expressed satisfaction with the classes and the coverage of their syllabus and courses. The study highlighted the need for proper orientation or hands-on experience to be introduced among the students.

5.2.8 Findings regarding the Perception of Teachers of Professional and General Degree Colleges in Mizoram about Web-based Learning

- 1) Out of 25 teachers from the professional colleges in Mizoram, the majority (48%) of students had a ‘moderately positive perception’ of web-based learning.
- 2) Out of 82 teachers from the general degree colleges in Mizoram, the majority (57%) of teachers had a ‘moderately positive perception’ on web-based learning.
- 3) Among 107 college teachers in Mizoram, the majority (55%) of the teachers had a ‘moderately positive perception’ of web-based learning.

5.2.9 Findings regarding the Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning

- 1) Among 278 students of the professional colleges in Mizoram, the majority (60%) of the students had a ‘moderately positive perception of web-based learning.
- 2) Among 1625 students from the general degree colleges in Mizoram, the majority (63%) of the students had a ‘moderately positive perception of web-based learning.
- 3) Out of 1903 students from different colleges in Mizoram, the majority (62%) of the students had a ‘moderately positive perception’ of web-based learning.

5.2.10 Discussion regarding the Perception of Teachers and Students of Professional and General Degree Colleges in Mizoram about Web-based Learning

The findings revealed that teachers in both professional colleges and general degree colleges in Mizoram held a moderately positive perception of web-based learning and improved their performance in the use of web-based learning, which the study of Thangamani and Nagavalli (2017), Popicivi and Mironov (2015) supported a similar finding. One possible explanation of this

finding could be that teachers and students nowadays are advanced in using innovative technology and have a deep understanding of the concept of web-based learning. They were deeply aware of the transition made by digital technologies and seemed to understand that a more rational advance based on specific developments might prove even more effective. A similar result was found in the research of Vahedi et al. (2019), stating that a positive perception was identified in their research incorporating information and communication technology in the classroom. However, some students had negative attitudes with regard to policies that would confine the use of web-based technology in the classroom. One key element contributing to the success of web-based teaching and learning was the integration of ICT tools and facilities (Ghavofekr & Rosdy, 2015).

5.2.11 Findings regarding the Uses of Web-Based Learning among Teachers of Professional and General Degree Colleges in Mizoram

- 1) The majority (68%) of the teachers from professional colleges ‘always’ used the Internet for self-study; 63% of the teachers from the general degree colleges ‘always’ used the Internet for self-study, and the majority (64%) of the college teachers in Mizoram ‘always’ used the internet for self-study.
- 2) The majority (64%) of the teachers from professional colleges ‘always’ encouraged students to use web-based learning; 46% of the teachers from general degree colleges ‘always’ encouraged students to use web-based learning, and 50% of the college teachers in Mizoram ‘always’ encouraged their students, and the remaining 50% of them ‘sometimes’ urged their students to use web-based learning.
- 3) Among the professional colleges, the majority (68%) of the teachers ‘sometimes’ consulted e-textbooks for supplementary knowledge; the majority (73%) of the teachers from the general degree college ‘sometimes’ consulted e-textbooks, and the majority (72%) of the college teachers in Mizoram ‘sometimes’ consulted e-textbook.

- 4) The majority (60%) of the teachers from professional colleges ‘always’ downloaded pictures and diagrams for teaching; 61% of the teachers from the general degree colleges ‘sometimes’ downloaded pictures and diagrams for teaching, and the majority (56%) of the college teachers in Mizoram ‘sometimes’ downloaded picture diagrams for teaching.
- 5) The majority (68%) of the teachers from the professional college ‘sometimes’ preferred the transfer of learning materials through email or online to their students, and 55% of the teachers from general degree colleges ‘sometimes’ preferred to transfer materials through email or online to their students, and the majority (58%) of the college teachers in Mizoram ‘sometimes’ preferred the transfer of materials through email or online to their students.
- 6) The majority (64%) of the teachers from the professional colleges ‘sometimes’ used web-based learning comfortably; the majority (56%) of teachers from the general degree colleges ‘sometimes’ used web-based learning comfortably, and the majority (58%) of the college teachers ‘sometimes’ used web-based learning comfortably.
- 7) The majority (76%) of the teachers ‘sometimes’ used different educational blogs and social media for academic interaction; at the same time, the majority (73%) of the teachers from general degree colleges ‘sometimes’ used different educational blogs and social media for academic interaction, and the majority (74%) of college teachers ‘sometimes’ used different educational blogs and social media for academic interaction.
- 8) The majority (64%) of the teachers from professional colleges collected materials through the internet ‘sometimes’, and the majority (65%) of teachers from general degree colleges ‘sometimes’ collected materials through the internet. Thus, the majority (64%) of the college teachers in Mizoram ‘sometimes’ collected materials through the internet.
- 9) Among the teachers from professional colleges, the majority (64%) of them ‘sometimes’ suggested e-content as supplementary reading materials and the majority (79%) of the teachers ‘sometimes’ suggested e-content as supplementary reading materials. It was clear that the majority (76%) of the

college teachers in Mizoram ‘sometimes’ suggested e-content as supplementary reading materials.

- 10) The majority (60%) of the teachers from professional colleges ‘always’ visited various links or websites that would help them in their teaching. Among the teachers of general degree colleges in Mizoram, the majority (61%) of the teachers ‘sometimes’ visited various links or websites related to their syllabus or course to improve their knowledge. Among the college teachers in Mizoram, the majority (56%) of the college teachers ‘sometimes’ visited various links or websites related to their syllabus or course.
- 11) The majority of teachers (64%) in Mizoram reported that they sometimes used internet resources related to their syllabus or course content. Specifically, 63% of teachers from general degree colleges reported the same. This suggested that a majority of college teachers in Mizoram made use of the internet as a resource from time to time.
- 12) The majority (64%) of the teachers from the professional colleges ‘sometimes’ preferred the online submission of assignments. Among the general degree colleges, the majority (54%) of the teachers ‘sometimes’ preferred the online submission of assignments. It was evident that the majority (56%) of the college teachers in Mizoram ‘sometimes’ preferred the online submission of assignments.
- 13) The majority (52%) of the teachers ‘sometimes’ used the different types of audio-video materials for updating their knowledge. Among the general degree colleges, the majority (61%) of the teachers ‘sometimes’ used the different types of audio-video materials in updating their knowledge. It could also be seen that the majority (59%) of the college teachers ‘sometimes’ used different types of audio-video materials to help them update their knowledge.
- 14) The majority (56%) of teachers from professional colleges ‘always’ used the e-groups within the class for making announcements and arrangements for meetings; and the majority (55%) of the teachers from general degree colleges ‘sometimes’ used the e-groups within the class for announcements and arrangement for meetings. Among the college teachers in Mizoram, the majority (51%) of the teachers ‘sometimes’ used the e-group within the class

for announcements and arrangements for meetings since it was convenient to share information through e-groups.

- 15) The majority (60%) of professional college teachers ‘sometimes’ used web-based learning to overcome inferiority complex; on the other hand, the majority (77%) of the teachers from general degree colleges ‘sometimes’ used web-based learning to overcome inferiority complex. Among the college teachers in Mizoram, the majority (73%) of the college teachers ‘sometimes’ used web-based learning to overcome their inferiority complex.

5.2.12 Discussion regarding the Uses of Web-based Learning among Teachers of Professional and General Degree Colleges in Mizoram

The study found that many college teachers in Mizoram frequently used the internet for self-study and encouraged their students to utilize web-based learning. They often used e-books, downloaded pictures and diagrams for teaching, and preferred to provide resources to their students through email or other online platforms. Some of the teachers occasionally used social media and educational blogs for academic interaction, in addition to using web-based learning with ease. They also browsed various links and websites related to the course curriculum for additional reading and sometimes used online course content due to its high quality and easy availability. The difference regarding the perspective and educational background of professional and general degree colleges might have led to visiting various links or websites. The study also found that some teachers were in favour of online assignment submissions.

While communicating with their students, most teachers found that web-based learning helped them overcome an inferiority complex since some of them had difficulties expressing themselves before many audiences. Many responses frequently used audio-video resources to stay updated with current data and information, and utilized class e-groups for announcements and meeting schedules.

The investigator noted that many responses ended with ‘sometimes’ or ‘occasionally’ because the respondents were hesitant to address significant issues regarding the utilization of web-based learning in their institutions. Additionally, the investigator observed that teachers might have been reluctant to adopt technology due to inadequate equipment, lack of proper training, poor administrative support, slow internet speeds, lack of confidence, and absence of expert technical staff, leading to doubts about the effectiveness of web-based resources.

5.2.13 Findings regarding the Uses of Web-based Learning among Students of Professional and General Degree Colleges in Mizoram

- 1) The majority (57%) of the students from professional colleges ‘sometimes’ used the internet for self-study, and the majority (61%) of the students from general degree colleges ‘sometimes’ used the internet for self-study. It was clear that the majority (61%) of the college students in Mizoram ‘sometimes’ used the internet for self-study.
- 2) The majority (73%) of students from professional colleges stated that web-based learning ‘sometimes’ motivated them in their studies, and the majority (67%) of students from general degree colleges said the same. Overall, 68% of college students in Mizoram felt motivated when using web-based learning in their studies.
- 3) It had been worth noting that among professional colleges, the majority (46%) of students had reported 'sometimes' consulting e-textbooks, while in general degree colleges, this number had risen to 68%. This had suggested that a majority of college students in Mizoram, 68% to be exact, 'sometimes' had consulted e-textbooks.
- 4) The majority (46%) of the students from professional colleges ‘sometimes’ downloaded pictures and diagrams, and 58% of students from the general degree college ‘sometimes’ downloaded pictures and diagrams. The majority(56%) of the students ‘sometimes’ downloaded pictures, and diagrams for their studies.

- 5) The majority (60%) of the students from professional colleges ‘sometimes’ preferred the transfer of material through email or online, and the majority (61%) of the students from general degree colleges ‘sometimes’ preferred to transfer their material through email or online. It was clear that the majority (61%) of the college students in Mizoram ‘sometimes’ preferred the transfer of material through email or online because of their teachers and classmates.
- 6) The majority (57%) of the students in professional colleges ‘sometimes’ used web-based learning comfortably, and among the general degree colleges, the majority (61%) of the students ‘sometimes’ used web-based learning comfortably. It was found that the majority (61%) of the college students in Mizoram sometimes used web-based learning comfortably.
- 7) The majority (67%) of the students from professional colleges ‘sometimes’ used different educational blogs and social media for academic interaction, and among the general degree colleges, 68% of the students ‘sometimes’ used different educational blogs and social media for academic interaction. It was evident that the majority (68%) of the college students in Mizoram ‘sometimes’ used different educational blogs and social media for academic interaction.
- 8) The majority (59%) of the students from professional colleges ‘sometimes’ collected learning materials from the internet; the majority (64%) of the students from general degree college ‘sometimes’ used the internet for collecting learning materials, and the majority (63%) of them ‘sometimes’ collected learning materials from the internet.
- 9) The majority (71%) of the students from professional colleges ‘sometimes’ used e-content as supplementary reading resources; the majority (75%) of the students from general colleges ‘sometimes’ used e-content as supplementary reading resources and the majority (74%) of the students ‘sometimes’ used e-content as supplementary reading resources.
- 10) The majority (62%) of students from professional college ‘sometimes’ visited the links or websites related to their syllabus or course to obtain the reading materials; 59% of students from general college ‘sometimes’ visited the links or websites related to their syllabus or course. However, the majority (59%)

of the college students in Mizoram ‘sometimes’ visited the links or websites related to their syllabus or course.

- 11) The finding had revealed that the majority (69%) of students from professional colleges had reported using the internet ‘sometimes’ to access high-quality content related to their course or syllabus. Similarly, among the general degree colleges, 67% of students had indicated that they ‘sometimes’ had used the internet to access high-quality course-related content. Additionally, 67% of students from both types of colleges had reported using the internet ‘sometimes’ due to the good quality of course-related content available.
- 12) As per the data, a majority of professional college students (44%) indicated that they ‘sometimes’ preferred to submit their assignments online. Similarly, 47% of general college students also expressed a ‘sometimes’ preference for online assignment submission. Interestingly, among college students in Mizoram, 47% reported a ‘sometimes’ preference for online assignment submission.
- 13) Out of the 278 students from the professional college, the majority (50%) of the student ‘sometimes’ used different types of audio-video materials to update their knowledge, at the same time, out of the 1625 students from the general degree college, the majority (58%) of the students ‘sometimes’ used different types of audio-video materials to update their knowledge. Thus, out of the 1903 college students in Mizoram, the majority (57%) of the students ‘sometimes’ use different types of audio-video materials for updating their knowledge.
- 14) Among the professional colleges, the majority (56%) of the students ‘sometimes’ used e-groups to post necessary information, and among the students of general degree colleges, the majority (67%) of the students ‘sometimes’ used the e-groups within the class for announcement and arrangement for a meeting. Thus, among the college students, the majority (65%) of the college students ‘sometimes’ used the e-groups to make announcements and make arrangements for a meeting.

15) The majority (72%) of students from professional colleges ‘sometimes’ used web-based resources to overcome the inferiority complex, and the majority (71%) of the students from the general degree college ‘sometimes’ used web-based learning to overcome the inferiority complex. Thus, the majority (71%) of the students ‘sometimes’ used web-based learning to overcome their inferiority complex.

5.2.14 Discussion regarding the Uses of Web-Based Learning among Students of Professional and General Degree Colleges in Mizoram

The study reported that the majority of college students in Mizoram occasionally used the internet for self-study. It was reported by the students that adopting web-based learning usually inspired them to strive further in their studies. Pictures and diagrams were very much essential for a better and more concrete understanding of the content; they sometimes downloaded them for better learning and obtained the course materials from an e-book. Many students frequently opted to send assignments to their teachers and classmates via email or online, and at times, they had no trouble using web-based learning. Many students often utilise social media and various educational blogs for academic interaction in addition to gathering online resources for their coursework. The majority of the students find ICT convenient and appropriate, as it is easy to get supplementary learning materials and information from different links or websites with one click. They preferred to submit their assignments online. They frequently utilized the course and materials that were readily available online. The majority of them often overcame inhibitions while dealing with teachings by using web-based learning. Various audio-video resources were used to assist in maintaining focus in the classroom. Students usually set up meetings and make announcements via e-groups.

The investigator found that a large number of responses ended with ‘sometimes’ or ‘occasionally’ because the students who participated were unwilling to address the major issues about the usage of web-based learning

in the classroom environment. The investigator believed that students were refusing to use technology willingly due to limited accessibility, network connection, lack of teachers' competency and lack of motivation from teachers and parents.

5.2.15 Findings related to the comparison of the Perception of Teachers of Professional and General Degree Colleges in Mizoram about Web-based Learning

- Teachers of professional colleges had a higher perception than teachers of general degree colleges towards the use of web-based learning.

5.2.16 Discussion related to the comparison of the Perception of Teachers of Professional and General Degree Colleges in Mizoram about Web-based Learning

Curriculum relevance and integration of technology in professional colleges and general degree colleges could have been the reason why teachers of professional colleges had a higher perception than teachers of general degree colleges towards the use of web-based learning. Professional colleges often require online resources and digital platforms which were relevant and essential for their academic purposes. Meanwhile, general degree colleges frequently practiced traditional academic disciplines which could result in slower adaptation to the new technologies.

5.2.17 Findings related to the comparison of the Perception of Teachers of Professional and General Degree Colleges in Mizoram regarding Web-based Learning with reference to their Gender

- Female teachers had a higher positive perception of web-based learning than male teachers among professional and general degree colleges.

5.2.18 Discussion related to the comparison of the Perception of Teachers of Professional and General Degree Colleges in Mizoram regarding Web-based Learning with reference to their Gender

Female college teachers had a significantly more positive perception of the use of web-based learning compared to male college teachers. The reasons for this finding might have included the greater openness of female college teachers to new approaches, giving more emphasis to student-centred teaching, and placing value on flexibility and professional growth. This finding was similar to the findings of Jarald (2010), who stated that female teachers exhibited a more positive opinion regarding web-based learning.

5.2.19 Findings related to the comparison of the Perception of Teachers of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Discipline

- Teachers of computer application discipline had the highest positive perception regarding the use of web-based learning.
- Teachers of veterinary science discipline had the lowest positive perception regarding the use of web-based learning.

5.2.20 Discussion related to the comparison of the Perception of Teachers of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Discipline

Teachers of computer application discipline had the most positive perceptions of web-based learning due to their technological proficiency, the subject matter being aligned with online learning tools, their access to a wealth of resources, the opportunities for interactive and practical learning, and positive experiences.

When it came to technology, teachers in veterinary science fields might not have been as familiar with it as those in more technologically

focused fields. This may have had an impact on their capacity to produce interesting online material and use web-based learning resources efficiently.

5.2.21 Pair-wise comparison regarding the Perception of Teachers of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Discipline

The study revealed that-

- A significant difference (0.004) was found between teachers of veterinary science discipline and teachers belonging teacher education.
- A significant difference (0.008) was found between teachers of technology and teachers belonging teacher education.
- A significant difference (0.001) was found between commerce teachers and teachers belonging teacher education.
- A significant difference (0.004) was found between law teachers and teachers belonging teacher education.
- A significant difference (0.000) was found between teachers of arts discipline and teachers belonging teacher education.
- A significant difference (0.001) was found between science teachers and teachers belonging teacher education.

5.2.22 Discussion on pair-wise comparison regarding the perception of teachers of professional and general degree colleges in Mizoram about web-based learning with reference to their discipline

IASE is a teacher education institution with students and teachers from diverse disciplines. The teachers also had a variety of educational backgrounds, which helped them in using specific technologies. Their areas of specialization included instructional tactics, pedagogical ideologies, learning theories, and teaching technologies. This might have been the reason that teachers of teacher education had a significant difference as compared to other disciplines teachers.

However, there was no significant difference among teachers of other disciplines, such as teachers of veterinary science, computer technology, commerce, law, arts, and science. Since web-based learning is closely related to the educational system nowadays.

5.2.23 Findings related to the comparison of the Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning

- Students of professional colleges had a higher perception than students of general degree colleges regarding the use of web-based learning.

5.2.24 Discussion related to the comparison of Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning

The connection of web-based learning with career goals, technology exposure, and institutional support could be seen as accountable factors for having a significantly high perception regarding the use of web-based learning among professional college students. These may have been the reasons why professional college students had a more positive perception in terms of the use of web-based learning than general college students. Students in general degree colleges, on the other hand, could have viewed web-based learning differently depending on a variety of criteria; they may have had doubts about the capacity of their online education, their ability to communicate with peers and teachers, and the legitimacy of their online credentials. The different perspective of web-based learning could have been the reason why the students of professional colleges had a higher perception than the general degree college.

5.2.25 Findings related to the comparison of the Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Gender

- Male students had a higher perception of web-based learning than female students among the professional colleges and general degree colleges.

5.2.26 Discussion related to the comparison of the Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Gender

Challenges and societal stereotypes that influenced the perceptions of technological ability, and an inclusive educational and workplace environment, could have been the reason why male students had a higher perception regarding web-based learning. Apart from these factors, a significant role in pursuing and succeeding in technology-related careers could also have been the explanation for why male students had a more positive perception of web-based learning than female students among the professional colleges and general degree colleges in Mizoram.

5.2.27 Findings related to the comparison of the Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Discipline

- Students of teacher education had the highest positive perception, and computer application students had the lowest positive perception of the use of web-based learning.

5.2.28 Discussion related to the comparison of the Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Discipline

The students of teacher education had a diverse educational setting that improved their ability to use particular technologies, and the attribute of the institutional nature could have been the cause of the notable point why they had the 'highest perception' of web-based learning. On the other hand, it was surprising to find that students of technology had a 'low perception' of web-based learning. The critical perspective might have been shaped by in-depth knowledge, high expectations, and ethical and societal considerations, the realism of the technology industry could have been the explanation for why students of technology had a low perception of web-based learning.

5.2.29 Pair-wise comparison regarding the Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Discipline

The study revealed that-

- A significant difference was found between students of law and science (0.007); law and veterinary science (0.018); law and computer science (0.000); law and medical (0.000), and law and teacher education (0.000).
- A significant difference was found between students of arts and science (0.002); arts and computer science (0.000); arts and medical (0.000), and arts and teacher education (0.000).
- A significant difference was found between students of computer application and computer science (0.033); computer application and medical (0.015), and computer application and teacher education (0.000).
- A significant difference was found between students of commerce and computer science (0.002), commerce and medical (0.000), and commerce and teacher education (0.000).

- A significant difference was found between students of science and computer science (0.041), science and medical (0.008), and science and teacher education (0.000).
- A significant difference was found between students of veterinary science and teacher education (0.000).
- A significant difference was found between students of computer science and teacher education (0.010) and between students of medical and teacher education (0.006).

5.2.30 Discussion on pair-wise comparison regarding the Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Discipline

Students from various disciplines had different perspectives on web-based learning, which were influenced by the distinctive requirements and features of their respective fields of study. These perceptions were shaped by a number of factors, including the discipline's nature, learning objectives, prior technological experience, pedagogical approaches, the need for community and collaboration, resource availability, and the adaptability and accessibility of web-based learning. Understanding these factors could help students mould educational opportunities to more effectively tackle the needs of students in various fields.

5.2.31 Findings related to the comparison of Uses of Web-based Learning among Teachers of Professional and General Degree colleges in Mizoram

- The usage of web-based learning was higher among teachers of general degree colleges than the teachers of professional colleges.

5.2.32 Discussion related to the comparison of Uses of Web-based Learning among Teachers of Professional and General Degree colleges in Mizoram

College teachers in Mizoram may have used web-based learning in different ways depending on the field of education. The subject matter, institutional resources, and teaching styles, as well as the impact and uptake of web-based learning tools, may all have contributed to general degree college teachers' having a higher positive perception regarding the use of web-based learning than the teachers of the professional college.

5.2.33 Findings related to the comparison of Uses of Web-based Learning among Teachers of Professional and General Degree Colleges in Mizoram with reference to their Gender

- Usage of web-based learning was higher among male teachers than female teachers of professional and general degree colleges.

5.2.34 Discussion related to the comparison of Uses of Web-based Learning among Teachers of Professional and General Degree Colleges in Mizoram with reference to their Gender

It could be concluded that male teachers used web-based learning more often than female teachers among the college teachers of professional colleges and general degree colleges in Mizoram. Computer technology proficiency may have affected how male teachers were perceived as being more technologically skilled, which could have resulted in presumptions about their higher usage of web-based learning. The usage of web-based learning was practised more by male teachers than female teachers which was the reason why they had a higher usage of web-based learning than their counterparts.

5.2.35 Findings related to the comparison of Uses of Web-based Learning among Teachers of Professional and General Degree Colleges in Mizoram with reference to their Discipline

- No significant difference (0.452) was found in the use of web-based learning among teachers of professional colleges and general degree colleges in Mizoram with reference to their discipline.

Therefore, multiple comparisons were not performed as the overall test did not show significant differences across samples.

5.2.36 Findings related to the comparison of Uses of Web-based Learning among Students of Professional and General Degree Colleges in Mizoram

- Usage of web-based learning was higher among the students of professional colleges than the students of general degree colleges.

5.2.37 Discussion related to the comparison of Uses of Web-based Learning among Students of Professional and General Degree Colleges in Mizoram

The practical nature of professional college curricula and the need for specialized skill development naturally lent themselves to the use of web-based learning technologies. Professional college students frequently use academic websites for educational purposes. On the other hand, while general degree college students also regularly visited links related to their education, they placed more emphasis on conventional methods. This was because the nature of their curricula differs and does not require as much assistance from computer technology compared to professional colleges. Therefore, it could be concluded that students in professional colleges used web-based learning more frequently than students in general degree colleges.

5.2.38 Findings related to the comparison of Uses of Web-based Learning among Students of Professional and General Degree Colleges in Mizoram with reference to their Gender

- The usage of web-based learning was higher among male students than female students in the professional and general degree colleges. A similarity was found in the study of Venkatesh et al (2019), stating that male students had significantly higher computer self-efficacy and satisfaction than female students.

5.2.39 Discussion related to the comparison of Uses of Web-based Learning among Students of Professional and General Degree Colleges in Mizoram with reference to their Gender

Male students usually showed a higher level of self-assurance and competency than female students do when it came to the usage of web-based learning among the students of professional colleges and general degree colleges in Mizoram. In professional colleges and general degree colleges in Mizoram, male students tended to demonstrate higher levels of self-assurance and competence when using web-based learning compared to female students.

5.2.40 Findings related to the comparison of uses of web-based learning among students of professional and general degree colleges in Mizoram with reference to their discipline

- Students of computer science used web-based learning most frequently, and computer application students became the least user of web-based learning.

5.2.41 Discussion related to the comparison of Uses of Web-based Learning among Students of Professional and General Degree Colleges in Mizoram with reference to their Discipline

It was found that the students of computer science had the most usage of web-based learning as compared to other disciplines. This might have been because the features of the institution, its curricula, requirements and availability of resources within the computer science encircle brought to light that students of computer science became the most frequent users of web-based learning computer science. At the same time, it was also found that students of computer science became the least users of web-based learning; workload and stress, interdisciplinary may have led to a more nuanced and occasionally critical view of computer science's role and effectiveness which could have resulted in the least usage of web-based learning among the students of computer application.

5.2.42 Pair-wise comparison on Usage of Web-based Learning among the Students of Professional and General Degree Colleges in Mizoram with reference to their Discipline

The study revealed that-

- A significant difference was found between students of computer application and teacher education (0.017); computer application and veterinary science (0.011), and computer application and computer science (0.005).
- A significant difference was found between students of arts and teacher education (0.000); arts and veterinary science (0.002), and arts and computer science (0.000).
- A significant difference was found between students of commerce and teacher education (0.022); commerce and veterinary science (0.006), and commerce and computer science (0.001).

- A significant difference was found between medical students and veterinary science students (0.049), and between students of medical and computer science (0.023).
- A significant difference was found between students of science and teacher education (0.017), science and veterinary science (0.021), and science and computer science (0.006).

5.2.43 Discussion on pair-wise comparison regarding Usage of Web-based Learning among the Students of Professional and General Degree Colleges in Mizoram with reference to their Discipline

The diverse educational needs and approaches to teaching and learning techniques, and discipline-specific requirements contributed to the selection of web-based learning tools. Each field reflected the usage of different web-based learning tools, which showed that there was a significant difference among the students of various disciplines. Understanding these differences can assist students in providing more tailored and effective online learning experiences across various fields.

5.2.44 Suggestions for improving Web-based Learning Resources among the Professional and the General Degree College Administration

- 1) It is imperative that all higher education institutions, both public and private, possess the minimum essential facilities required for effective web-based learning. Education is related to the concurrent list of the Indian Constitution; both central and state governments share a crucial responsibility. They should provide dedicated grants and funding, especially for the establishment and upgrade of necessary infrastructure and resources related to computer science. Similarly, private institutions, which were run by any individual or organization must also be mandated to provide adequate web-based learning facilities in their colleges to ensure equitable access and quality education for all students. This proactive mandate will lay the foundational digital infrastructure.

- 2) An effective and hands-on orientation programme is essential for maximizing the utilization of web-based learning resources. The COVID-19 pandemic highlighted that online classes were only a substitute for offline or face-to-face instruction. Without proper knowledge of web-based learning, both teachers and students will struggle to fully leverage their potential independently.
- 3) Proper maintenance of available resources related to web-based learning is required for all institutions. Neglecting maintenance can lead to frequent downtime, outdated information, and a diminished user experience, undermining the investment in these resources.
- 4) The teachers and students have shown an average level of positive perception regarding web-based learning. Therefore, it is necessary that some steps should be taken which can gradually create a more positive attitude towards web-based learning. This can be achieved through demonstrating its practical benefits.
- 5) Both teachers and students in professional and general degree colleges utilized web-based learning to an average extent, indicating a need for specific strategies to boost its widespread adoption. Thus, to increase the use of web-based learning by teachers and students of these institutions, it is required to develop a positive mindset for web-based learning with all the physical support and availability.
- 6) Seminars or workshops should be conducted frequently and regularly for both teachers and students regarding web-based learning.
- 7) The introduction and integration of various academic platforms should be encouraged as frequently as possible to diversify learning experiences and cater to different needs.
- 8) Furthermore, free wi-fi or free internet or intranet connectivity should be provided.

5.3 Conclusion

The research findings unequivocally establish the transformative impact of web-based learning across all levels of education, from early childhood to higher education. The unprecedented events of the pandemic highlighted the widespread adoption of web-based learning, with even pre-primary students engaging in online classes. This mode of learning has become the cornerstone for accessing educational resources, attending classes, exploring career opportunities, and achieving professional success. Its significance extends beyond technical courses to encompass general degree programs such as B.A., B.Com., B.Sc., and others, are reshaping the landscape of education in professional and general degree colleges. The far-reaching influence of web-based learning is evident in its provision of flexibility, accessibility, and interactive learning experiences. Students now have access to an array of resources, enabling personalized learning paths and fostering a culture of self-directed education, with teachers playing a pivotal role in guiding their development and success. Previous research has underscored the indispensable nature of web-based learning, particularly during unforeseen disruptions, ensuring continuity in education. Furthermore, its integration has transcended geographical boundaries, fostering global collaboration and offering diverse perspectives. Despite these advancements, challenges such as the digital divide and ensuring equitable access persist, necessitating ongoing efforts to ensure inclusiveness.

The study's findings shed light on the state of web-based learning in both professional and general degree colleges in Mizoram. It was observed that there are significant challenges in terms of the availability, accessibility, and positive perceptions regarding the usability of web-based learning in these institutions. A notable disparity was noted between the attitudes of teachers and students in professional degree colleges compared to those in general degree colleges, with the former exhibiting more positive perceptions and a better grasp of the potential uses of web-based learning.

Furthermore, an in-depth comparison was made among different disciplines, revealing a significant difference between teacher education and other disciplines.

This disparity indicates that teacher education boasts a more conducive environment and superior resources for web-based learning compared to its counterparts in Mizoram. The study also noted that even in colleges solely dedicated to technological education, such as NIELIT, the perception of web-based learning among teachers was not as positive as their counterparts belonging to teacher education.

In conclusion, the study emphasized the fundamental role of web-based learning in modern education, underscoring its potential to provide limitless opportunities for growth and innovation. It also highlights the need to leverage the continuous evolution of computer technology to create a more dynamic, accessible, and student-centred educational environment across professional and general degree colleges in Mizoram. Furthermore, it underscores the importance of addressing the mindset of teachers in both types of colleges to ensure the effective integration of web-based learning into the teaching and learning process.

5.4 Educational Implications of the Study

1. For policymakers: The policymakers can utilize the findings of this research to form policies regarding e-learning resources or web-based learning resources. Some special provisions can be made for the states of North-East India and other hilly regions, as the geographical conditions of the states are challenging.
2. For grant-in-aid agencies: The findings indicate that there were not adequate web-based resources in most of the institutions. So the granting agencies should provide the required grants or funds to equip higher education institutions with the necessary resources related to web-based learning.
3. For college administration: Based on the findings of the study, the college administration should go for proper training, maintenance and a positive environment for the use of web-based learning.
4. For teachers: Teachers had an average level of perception regarding the use of web-based learning, and they were using it at an average level in the teaching-learning process. And at the same time, students were also not very

much motivated to use it for learning purposes. So the teacher may be aware of the status of perception of students regarding the use of web-based learning and can accordingly guide them.

5. For students: Students must take an active role in maximizing the benefits of web-based learning by proactively utilizing digital resources to enhance their academic growth.
6. For parents and society: According to the findings, web-based learning resources were widely used by both teachers and students for recreational and entertainment purposes rather than academic purposes. While recreational activities and entertainment are also important, a large section of society is using the internet and other resources for non-learning purposes. Therefore, it is necessary for society members and parents, especially those with undergraduate students in their teenage years, to provide proper guidance and motivation for academic pursuits.

5.5 Suggestion for Further Research

In the light of the present study, the researcher encouraged and suggested the following areas for further research:

1. A comparative study can be conducted among Mizoram and some other states of North-East India which have similar geographical conditions to find out the availability and access to web-based learning resources.
2. With the same objectives, studies can be conducted in other states of India.
3. A comparative study can also be taken between Mizoram and other Indian states that have flat land to find out the differences in terms of availability, access, perception and uses of web-based learning.
4. A comparative study of the different categories of colleges such as government, private, aided, and unaided, can also be done.
5. A study on teachers' and students' attitudes, interests, and perceptions of social media with regard to academic performance can be conducted.
6. The impact of web-based learning on academic performance can be studied in various colleges in India.

7. A study on the status and uses of web-based resources in various colleges in India can be conducted.

5.6 Limitations of the Study

1. Conducting research with a larger sample was planned by the researcher but due to some constraints, such as the unavailability of teachers on the college campus, and less cooperation from the teachers' side, the data from the ideal sample size could not be collected.
2. Some statements were not properly answered by some participants. Therefore, the researcher removed those questionnaires during tabulation of data and interpretation which reduced the sample size of the students.
3. From the questionnaire distributed to the teachers of Government Kolasib College, only one teacher from BCA returned it. Therefore, the difference in the mean rank through the Kruskal Wallis test could not be made by the SPSS. Thus, the comparison regarding perception and usage of web-based learning by teachers of BCA discipline has not been done with other disciplines.

APPENDIX - A

Checklist-cum-observation Schedule for the Available Resources related to Web-based Learning in the Institution

Name of the college :

Location :

Year of establishment :

Stream / subject offered :

Item No.	STATEMENTS	RESPONSES
		Yes / No (If Yes, how many or what type?)
1	Computer laboratory / E-resource centre	
2	Number of computer	
3	Institutional network	
4	Smart classroom	
5	E-resources	
6	Photocopier machine	
7	Video conferencing room	
8	Printer	
9	Scanner	
10	Projector	
11	Ergonomic furnishing	
12	Specific software	
13	Online mode used during the Covid-19 pandemic	
14	Language laboratory	
15	Academic platform	

APPENDIX – B

Questionnaire for Teachers to Investigate Accessibility of Web-Based Learning

Item No.	STATEMENTS	LABEL	RESPONSES (Put a tick ✓ Mark)
1	Used computer or laptop for	1-5 years	
		6-10 years	
		More than 10 years	
2	Used smart phone for	Less than a year	
		1-5 years	
		More than 5 years	
3	I am using the Internet for	Recreational	
		Preparing class lectures	
		Updating knowledge	
		Research work	
4	Access to Internet	Very rarely	
		Occasionally	
		A few times a week	
		Every day	
5	Access to network from the institution	No	
		Yes	
6	Social media platform (You can choose more than one)	Instagram	
		Facebook	
		Whatsapp	
		YouTube	
		Twitter	
		Telegram	
		Coursera	
7	Websites and academic platform	LinkedIn	
		Wikipedia	
		Academia.edu	
		ResearchGate	
8	Apps used for online interaction (academic)	Google Classroom	
		WebEx	
		Zoom	
		Google Meet	
9	Online personal space other than social networking sites	Yes	
		No	

10	Used search engine	Google		
		Yahoo		
		UC Browser		
11	Awareness of online sources	Friends / Colleagues		
		Family		
		Institution initiatives		
		Media		
12	Organized Orientation Programme on Web-based or ICT	Yes		
		No		
13	Computer basic knowledge	Excellent		
		Good		
		Average		
		Poor		
14	Ability to handling Web-based facility or ICT in teaching-learning	High		
		Medium		
		Low		
15	Preference type of teaching	Conventional / Traditional		
		Modern / Contemporary (Use of ICT or Web-based)		
16	Application software familiar with and used	How often do you use?		
		Always	Sometimes	Never
	i. MS Office			
	ii. Media player			
	iii. Accounting software			
	iv. Web conferencing			
	v. Anti-virus			
	vi. Graphic design software			
17	Application software familiar with and used	Label your proficiency		
		Excellent	Good	Poor
	i) MS Office			
	ii) Media player			
	iii) Accounting software			
	iv) Web conferencing			
	v) Anti-virus			
	vi) Graphic design software			
18	Types of system software familiar and used	How often do you use?		
	i. Windows	Always	Sometimes	Never
	ii. Linux			
	iii. IOS			
	iv. Android			

	v. Macintosh			
19	Types of system software familiar and used	<i>Label your proficiency</i>		
		Excellent	Good	Poor
	i) Windows			
	ii) Linux			
	iii) IOS			
	iv) Android			
	v) Macintosh			
20	Attending educational online programmes or live lectures in your institution?	Yes		
		No		
21	Rate the web-based facilities in your institution.	Adequate		
		Inadequate		
		Moderate		
22	Problems do you face during online classes (You can choose more than one)	Motivating students		
		Tracking students work or assignment		
		Lack of computer literacy skills		
		Network or internet connection failure		
		Problems in handling the online interface		
		Time management		
23	How do you like to receive students' works or assignments?	Softcopy		
		Hardcopy		
24	Online classes taken during Covid-19 pandemic	Very rarely		
		Occasionally		
		A few times a week		
		Every day		
25	Satisfaction with online class taken during the Covid-19 pandemic	Very satisfied		
		Satisfied		
		Slightly satisfied		
		Dissatisfied		
26	Satisfaction with course or syllabus covered during the Covid-19 pandemic	Very satisfied		
		Satisfied		
		Slightly satisfied		
		Dissatisfied		

APPENDIX- C

Questionnaire for Students to Investigate Accessibility of Web-Based Learning

Item No.	STATEMENTS	LABEL	RESPONSES (Put a tick ✓ Mark)
1	Own a computer or laptop	Yes	
		No	
2	Used computer or laptop for	1-5 years	
		6-10 years	
		More than 10 years	
3	Used smart phone for	Less than a year	
		1-5 years	
		More than 5 years	
4	Used the Internet for	Recreational	
		Preparing class lectures	
		Updating knowledge	
		Research work	
5	Access to Internet	Very rarely	
		Occasionally	
		A few times a week	
		Every day	
6	Access to network from the institution	No	
		Yes	
7	Social media platform (You can choose more than one)	Instagram	
		Facebook	
		Whatsapp	
		YouTube	
		Twitter	
		Telegram	
		Coursera	
8	Websites and academic platfrom	LinkedIn	
		Wikipedia	
		Academia.edu	
		ResearchGate	
9	Apps used for online interaction (academic)	Google Classroom	
		WebEx	
		Zoom	
		Google Meet	

10	Online personal space other than social networking sites	Yes		
		No		
11	Used search engine	Google		
		Yahoo		
		UC Browser		
12	Awareness of online sources	Friends / Colleagues		
		Family		
		Institution initiatives		
		Media		
13	Organized Orientation Programme on Web-based or ICT	Yes		
		No		
14	Computer basic knowledge	Excellent		
		Good		
		Average		
		Poor		
15	Ability to handling Web-based facility or ICT in teaching-learning	High		
		Medium		
		Low		
16	Preference type of teaching	Conventional / Traditional		
		Modern / Contemporary (Use of ICT or Web-based)		
17	Application software familiar with and used	How often do you use?		
		Always	Sometimes	Never
	viii. MS Office			
	ix. Media player			
	x. Accounting software			
	xi. Web conferencing			
	xii. Anti-virus			
	xiii. Graphic design software			
	xiv. Digital audio workstation			
18	Application software familiar with and used	Label your proficiency		
		Excellent	Good	Poor
	viii) MS Office			
	ix) Media player			
	x) Accounting software			
	xi) Web conferencing			
	xii) Anti-virus			
	xiii) Graphic design software			
	xiv) Digital audio workstation			
19	Types of system software familiar and used	How often do you use?		
	vi. Windows	Always	Sometimes	Never

	vii. Linux			
	viii. IOS			
	ix. Android			
	x. Macintosh			
20	Types of system software familiar and used	<i>Label your proficiency</i>		
		Excellent	Good	Poor
	vi) Windows			
	vii) Linux			
	viii) IOS			
	ix) Android			
	x) Macintosh			
21	Attending educational online programmes or live lectures in your institution?	Yes		
		No		
22	Rate the web-based facilities in your institution.	Adequate		
		Inadequate		
		Moderate		
23	Problems do you face during online classes (You can choose more than one)	Lack of motivation		
		Tracking of work or assignment		
		Lack of computer literacy skills		
		Network or internet connection failure		
		Problems in handling the online interface		
		Time management		
24	How do you like to submit your assignment?	Softcopy		
		Hardcopy		
25	Online class attended during the Covid-19 pandemic	Very rarely		
		Occasionally		
		A few times a week		
		Every day		
26	Satisfaction with online class attended during the Covid-19 pandemic	Very satisfied		
		Satisfied		
		Slightly satisfied		
		Dissatisfied		
27	Satisfaction with the course or syllabus covered during the Covid-19 pandemic	Very satisfied		
		Satisfied		
		Slightly satisfied		
		Dissatisfied		

APPENDIX – D

Perception of College Teachers about Web-Based Learning

Items. No.	STATEMENTS	RESPONSES		
		Always	Sometimes	Never
1	The use of Web-based learning increases the students' understanding.			
2	The use of Web-based learning improves the quality of the work of teachers with updated materials.			
3	The use of Web-based learning helps me complete my work quickly than usual.			
4	The use of Web-based learning helps me complete my work more smoothly than usual.			
5	I find Web-based teaching-learning interesting.			
6	I find Web-based teaching-learning useful.			
7	I can work according to my own pace using Web-based teaching-learning.			
8	The classroom management is out of control when web-based facilities are used for teaching-learning.			
9	I can still an effective teaching without web-based facilities			
10	The use of Web-based teaching-learning causes extra work.			
11	Web-based training should be provided to all teachers.	Agree	Undecided	Disagree
12	Web-based teaching is difficult to handle.			
13	Web-based learning is a waste of time.			
14	I find Web-based learning cost effective.			
15	Online classes can replace offline classes.			

APPENDIX – E

Perception of College Students about Web-Based Learning

Item No.	STATEMENTS	RESPONSES		
		Always	Sometimes	Never
1	The use of Web-based learning increases my understanding.			
2	The use of Web-based learning improves the quality of my assignment.			
3	The use of Web-based learning improves the quality of my assessment. (test/exam)			
4	The use of Web-based learning helps me complete my work more quickly than usual.			
5	The use of Web-based learning helps me complete my work more smoothly than usual.			
6	I find Web-based teaching-learning interesting.			
7	I find Web-based teaching-learning useful.			
8	I can study according to my own pace using Web-based facilities.			
9	The classroom management is out of control when Web-based facilities are used in learning.			
10	I can have an effective learning without Web-based facilities.			
11	Web-based training should be provided to all students.	Agree	Undecided	Disagree
12	Web-based learning is difficult to handle.			
13	Web-based learning is a waste of time.			
14	I find Web-based learning cost effective.			
15	Online classes can replace offline classes.			

APPENDIX – F

Usage of Web-Based Learning by College Teachers in the Institution

Item No.	STATEMENTS	RESPONSES		
		Always	Sometimes	Never
1	Use the internet for self-study			
2	Encourage students to use web-based learning			
3	Consultation of e-textbook			
4	Downloaded pictures or diagrams			
5	Preferred transfer of material through online			
6	Use of web-based learning is comfortable			
7	Different educational blogs and social media are used for academic interaction			
8	Collect materials from the internet			
9	Suggest e-content for supplementary learning			
10	Visit links and websites related to the syllabus or course			
11	Use of the internet relating to the course and content of syllabus because of its quality			
12	Preferred online submission of assignments			
13	Use different types of audio-video material to update knowledge			
14	Use e-group for announcement and arrangement of meetings			
15	Use web-based learning to overcome inferiority complex			

APPENDIX – G

Usage of Web-Based Learning by College Students in the Institution

Item No.	STATEMENTS	RESPONSES		
		Always	Sometimes	Never
1	Use the internet for self-study			
2	The use of web-based learning motivates me			
3	Consultation of e-textbook			
4	Downloaded pictures or diagrams			
5	Preferred transfer of material through online			
6	Use of web-based learning is comfortable			
7	Different educational blogs and social media are used for academic interaction			
8	Collect materials from the internet			
9	Suggest e-content for supplementary learning			
10	Visit links and websites related to the syllabus or course			
11	Use of the internet relating to the course and content of syllabus because of its quality			
12	Preferred online submission of assignments			
13	Use different types of audio-video material to update knowledge			
14	Use e-group for announcement and arrangement of meetings			
15	Use web-based learning to overcome inferiority complex			

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ABSTRACT

**WEB-BASED LEARNING AMONG TEACHERS AND STUDENTS
OF PROFESSIONAL AND GENERAL DEGREE COLLEGES IN
MIZORAM**

**AN ABSTRACT SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF
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**WEB-BASED LEARNING AMONG TEACHERS AND STUDENTS OF
PROFESSIONAL AND GENERAL DEGREE COLLEGES IN MIZORAM**

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Introduction

The introduction of technological innovation has revolutionized the traditional style of the teaching-learning process in the modern education system. Many institutions have positively embraced this technological advancement, although some institutions have yet to adopt these new techniques. However, the internet has brought about a massive change, resulting in a paradigm shift in the fundamental way in which learning takes place.

The Government of India has implemented several policies and schemes that prioritize the integration of ET to enhance the accessibility, quality and administration of education. These initiatives recommend the use of technology in education, and below are some of the major policies and schemes that support this approach.

- National Policy on Education (NPE) (1986) was a vital step in recognizing the role of technology in education.
- EDUSAT (2004) is a communication satellite meant for distance learning, built exclusively to serve the educational sector from the school level to higher education.
- NKC (2005) was formed to give impetus to empower educational institutions through high-speed networks and digital libraries and to produce an environment for optimal utilization of ICT in education.
- NMEICT (2009) was launched intending to provide affordable and quality education to all through the use of ICT. NMEICT focuses on initiatives like the National Programme on Technology Enhanced Learning (NPTEL), Virtual Labs, and e-content development for undergraduate and postgraduate education.
- The Digital India Campaign (2015) was to transform India into a digitally empowered society and knowledge economy by focusing on the four vision areas:
 - Digital Infrastructure as a Core Utility to Every Citizen

- e-Governance and Services on Demand
- Digital literacy and empowerment of citizens
- SWAYAM and SWAYAM Prabha provide online courses
- Atal Innovation Mission (AIM) (2016) focused on fostering innovation and entrepreneurship among students. It promotes the establishment of Atal Tinkering Labs (ATLs) in schools where students can learn through hands-on experience with technologies like 3D printing, robotics, and IoT (Internet of Things)
- NEP 2020 emphasizes the integration of technology at all levels of education. It promotes the use of digital tools for teaching, learning, assessment, and administration. It also envisions the establishment of a NETF to facilitate the exchange of ideas and best practices in technology-enabled education.
- Pradhan Mantri e-Vidya Program is an initiative taken during the COVID-19 pandemic. It aims to promote online education and digital learning platforms. It includes programmes like DIKSHA for digital content and online teacher training, as well as the provision of e-learning resources through television and radio.

Web-based learning has become an integral part of modern education, revolutionizing the traditional methods of teaching and learning. It offers a wide array of benefits, including increased accessibility, flexibility, and interactive learning opportunities for students. As technology continues to advance, it is essential to understand the rationale behind the integration of web-based learning in higher education and its impact on student learning outcomes. This study aims to delve into the various aspects of web-based learning, addressing its role in supporting traditional teaching methods, promoting essential digital literacy skills, and contributing to the overall academic experience of students. Furthermore, this exploration seeks to identify the challenges and benefits associated with the implementation of web-based tools, paving the way for the development of best practices and guidelines for effective integration in academic settings. Overall, this research endeavors to shed light on the potential impact of web-based learning on

student satisfaction, retention rates, and academic performance, ultimately enriching the educational experience for both educators and learners.

5.1.2 Rationale of the Study

Emerging technology is gradually covering the entire scope of human activities. Technological advancements have created a new field and are used for teaching and learning instead of traditional methods. The Internet has brought about a significant transformation, resulting in a paradigm shift in the basic way of learning. Also, the requirements of facilities in institutions differ from each other. The pandemic outbreak has also prompted the introduction of online learning, which is encouraged by faculty members to balance classroom activities and go beyond the constraints of a face-to-face setting. In this teaching paradigm, students can watch lecture videos prepared by their lecturers online, or in some institutions, teachers can also have live interactions online.

Today's educational environment is a complex interplay of goals, needs, completing requirements, pressures, and dwindling. In a country with vast diversity, Mizoram, an important geographical entity, positioned the 3rd highest Literacy rate in India with 91.3% on Census, 2011. The literacy rate may be highly positioned, but the State still needs more adequate facilities and services to have more manpower resources. Certain inherent challenges, such as the mountainous landscape and poor infrastructure, make development in this area challenging. The government must take steps to lessen the shortcomings of higher education in Mizoram. The Twelfth Five-Year Plan of the planning commissions has also laid emphasis on the quality of education in this region. It is necessary to integrate technological advancements into the teaching and learning process in order to stay up to date with the possibilities and demands that are always evolving.

Given the persuasive integration of technology into contemporary household and professional environments, children must acquire the requisite skills and knowledge for its effective utilization, fostering their academic and professional development. Taking this background into account, research on the application of

computers and computer-aided technology, also known as information and communication technology, in the teaching and learning process is desperately needed by society. The appropriate implementation of technology across all educational levels will help to streamline classroom operations, enhance teacher professional development, improve access to education for underprivileged learners and improve educational planning, governance, administration and management.

5.1.3 Statement of the Problem

With a view to finding out Web-based learning resources provided to the teachers and students and resources accessed by teachers and students, of professional and general degree colleges in Mizoram, the present study was formulated as below:

Web-based Learning among Teachers and Students of Professional and General Degree Colleges in Mizoram

5.1.4 Operational Definition of Key Terms

- **Web-based Learning:** Web-based learning is the practice of delivering education globally through the use of computers, the internet, and various other technological tools, such as mobile phones. The internet makes it feasible to participate in email-based discussion groups, video conferences, and live lectures or video streaming.
- **Professional Colleges:** Professional Colleges are educational institutions that prepare students to work in a particular profession, practice, or business sector, often meeting the academic requirements for licensure or accreditation. Professional courses refer to a variety of education and training in a specific area. These courses provide a well-defined area in medicine, engineering, management, Law, mass media, hospitality, computers, pre-service teacher training programmes, etc. In this study, the term 'professional course' refers to M.B.B.S., B.V. Sc. & A.H., B.Sc. Nursing, B. Pharma., B.Sc. MLT, B.Sc. RIT, B.C.A, L.L.B., and B.Ed.

- **General Degree Colleges:** General Degree Colleges are educational institutions that provide students with a breadth of knowledge across disciplines and depth into specific areas of personal interest. These include Bachelor of Arts (B.A.), Bachelor of Science (B.Sc.), Bachelor of Computer Application (COMPUTER SCIENCE), and Bachelor of Commerce (B.Com.).
- **Teachers:** A teacher is someone who provides education, instructs, and teaches. In this study, the term ‘teachers’ encompasses all educators working in degree colleges (undergraduate level) in Mizoram.
- **Students:** The term ‘student’ encompasses anyone enrolled in a school, college, or university. In this study, it refers to all individuals pursuing different degrees (undergraduate courses) in colleges in Mizoram.

5.1.5 Research Questions

In quantitative and qualitative studies, research questions help refine the purpose statement by concentrating on specific issues that aim to address. Researchers typically develop them before identifying the methods of the study, i.e. the types of data to be collected, analyzed, and interpreted in a study (Creswell, 2003).

After reviewing the relevant literature, the following questions were raised;

1. What are the types of web-based resources being provided to the teachers and students of professional and general degree colleges?
2. How are the ICT resources being utilized by the teachers and students?
3. How is web-based learning helpful in the teaching process?
4. How is web-based learning helpful in the learning process?
5. How do teachers of professional and general degree colleges differ in their perception of the use of web-based learning resources in the teaching-learning process based on their gender and discipline?

6. How do students of professional and general degree colleges differ in their perception of the use of web-based learning resources in the teaching-learning process based on their gender and discipline?
7. How do the teachers of professional and general degree colleges differ with regard to their perception and use of web-based learning?
8. How do the students of professional and general degree colleges differ with regard to their perception and use of web-based learning?
9. What are the areas of web-based services and practices which need to be improved?

5.1.6 Objectives of the Study

The objectives of the study were as follows.

1. To find out the web-based learning resources being provided to the teachers and students of professional and general degree colleges in Mizoram.
2. To find out the web-based learning resources being accessed by the teachers and students of professional and general degree colleges in Mizoram.
3. To find out the perception of teachers and students of professional and general degree colleges in Mizoram about web-based learning.
4. To find out the uses of web-based learning by the teachers and students of professional and general degree colleges in Mizoram.
5. To compare the perception of -
 - i. professional and general degree college teachers in Mizoram regarding web-based learning.
 - ii. professional and general degree college teachers in Mizoram with reference to their gender and discipline.
 - iii. professional and general degree college students in Mizoram regarding web-based learning.
 - iv. professional and general degree college students in Mizoram with reference to their gender and discipline.
6. To compare the uses of web-based learning among-
 - i. professional and general degree college teachers in Mizoram

- ii. professional and general degree college teachers in Mizoram with reference to their gender and discipline.
 - iii. professional and general degree college students in Mizoram
 - iv. professional and general degree college students in Mizoram with reference to their gender and discipline.
7. To give suggestions to the professional and the general degree college administration about the improvement of web-based learning resources.

5.1.7 Null Hypotheses (H_0)

A tentative solution to a problem that accounts for a set of facts and can be tested by further investigation is known as a hypothesis (Kerlinger, 2012). However, the null hypothesis (H_0) states that there is no true difference between the means of the two samples, and any variation between the sample means is purely coincidental and irrelevant, resulting from sampling fluctuations and random chance. The following hypotheses have been stated to realize the above objectives:

- i. There is no significant difference in the perception of teachers of professional and general degree colleges in Mizoram about web-based learning.
- ii. There is no significant difference in the perception of teachers of professional and general degree colleges in Mizoram about web-based learning with reference to their gender.
- iii. There is no significant difference in the perception of teachers of professional and general degree colleges in Mizoram about web-based learning with reference to their discipline.
- iv. There is no significant difference in the perception of students of professional and general degree colleges in Mizoram about web-based learning.
- v. There is no significant difference in the perception of students of professional and general degree colleges in Mizoram about web-based learning with reference to their gender.

- vi. There is no significant difference in the perception of students of professional and general degree colleges in Mizoram about web-based learning with reference to their discipline.
- vii. There is no significant difference in the use of web-based learning among teachers of professional and general degree colleges in Mizoram.
- viii. There is no significant difference in the use of web-based learning among teachers of professional and general degree colleges in Mizoram with reference to their gender.
- ix. There is no significant difference in the use of web-based learning among teachers of professional and general degree colleges in Mizoram with reference to their discipline.
- x. There is no significant difference in the use of web-based learning among students of professional and general degree colleges in Mizoram.
- xi. There is no significant difference in the use of web-based learning among students of professional and general degree colleges in Mizoram with reference to their gender.
- xii. There is no significant difference in the use of web-based learning among students of professional and general degree colleges in Mizoram with reference to their discipline.

5.1.8 Method of the Study

The research employed the descriptive survey method to collect data on the status of web-based learning in various professional and general degree colleges in Mizoram. The study primarily focused on quantitative research to determine the current state of web-based learning in these institutions.

5.1.9 Population

The population of the study consisted of all the teachers and students of professional colleges and general degree colleges in Mizoram.

5.1.10 Sample and Sampling Technique

A multi-stage sampling technique was employed to select participants, ensuring every sample unit (teachers and students) had an equal probability of being selected from the population. Multi-stage sampling, a more sophisticated form of cluster sampling, involves two or more stages of sample selection. In simple terms, in multi-stage sampling, large clusters of population were divided into smaller clusters in several stages in order to make primary data collection more manageable.

A total of 25 teachers were selected from professional colleges of Mizoram. From institutions such as RIPANS (Bachelor of Optometry, Bachelor in Pharmacy, Bachelor of Science in Nursing, Medical Laboratory Science, Master in Pharmacy, Master of Science in Nursing, Master in Medical Laboratory Science, and Doctor of Philosophy), IASE (Teacher Education Programme- Bachelor of Education, Master of Education, and Doctor of Philosophy), Government Mizoram Law College (Law), College of Veterinary Science and Animal Husbandry (Animal Breeding and Genetics, Animal Reproduction, Gynaecology and Obstetrics, Krishi Vigyan Kendra, Livestock Production and Management, Animal Nutrition, Instruction Livestock Farm Complex, Livestock Product Technology, Veterinary Anatomy and Histology, Veterinary and Animal Husbandry Extension, Veterinary Microbiology, Veterinary Pathology, Veterinary Physiology & Biochemistry, Veterinary Surgery and Radiology, Veterinary Medicine, Veterinary Parasitology, Veterinary Pharmacology and Toxicology, and Veterinary Public Health and Epidemiology), and NEILIT (Diploma in Computer Science & Engineering, Diploma in Electronics and Telecommunication Engineering, Bachelor of Computer Application, and Master of Computer Application. 'A' LEVEL, 'O' LEVEL, and MAT 'O') 10 male teachers and 15 female teachers. 278 students (132 male and 146 female) constituted the selected sample. The sample consisted of 64 students from medical; 108 students from teacher education, 29 students from law, 35 students from veterinary science, and 42 students from computer science. For some of the professional courses, only one institution was available. Therefore, the particular institution was automatically selected to ensure adequate representation from each subset of the population.

The researcher further categorised general degree colleges by their offered program such as; arts, science, commerce and computer application. An appropriate number of colleges from each category were randomly selected based on their population while collecting data for the study. The selected samples of teachers from general degree colleges were 82 teachers, with 43 male and 39 female teachers. Out of 1625 students, there were 740 male students and 885 female students. The total number of selected students for the present research from different general degree colleges studying in various disciplines. The sample consisted of 1045 students from the arts stream, 271 students from the science stream, 279 students from the commerce stream and 30 students from the computer application stream.

5.1.11 Tools Used for Data Collection

The investigator developed 7 tools for collecting the relevant data, which are mentioned below:

1. Checklist-cum-observation Schedule for the Available Resources related to Web-based Learning in the Institution
2. Questionnaire for Teachers to Investigate Accessibility of Web-Based Learning
3. Questionnaire for Students to Investigate Accessibility of Web-Based Learning
4. Perception of College Teachers about Web-Based Learning
5. Perception of College Students about Web-Based Learning
6. Usage of Web-Based Learning by College Teachers in the Institution
7. Usage of Web-Based Learning by College Students in the Institution

5.1.12 Validity and Reliability

Content validity ensures the extent to which a measuring instrument covers a representative sample of the behaviours it aims to measure (Jackson, 2009). In simpler terms, it can be said that it is about how well the instrument measures what it's supposed to measure. An instrument/tool with good content validity thoroughly covers all aspects of the domains. Ensuring content validity involves expert review of the instrument's items to judge their relevance and representativeness. Therefore, the drafted tools were given to seven (7) experts for content validation. Taking the experts' opinions into consideration, modifications were made to some items, and some were dropped from the final version of the tools.

The test-retest method, which assesses the consistency of a measurement (Jackson, 2009), was administered to evaluate the reliability of the study. This involved finding a correlation between two sets of scores or equivalent tests from the same group. The coefficient of correlation was interpreted using Pearson's Product-Moment Correlation (Garrett, 2009).

- Reliability of correlation coefficient indices for Web-based Learning Accessed by Teachers of Professional and General Degree Colleges – 0.73
- Reliability of correlation coefficient indices for Web-based Learning Accessed by Students of Professional and General Degree Colleges – 0.62
- Reliability of correlation coefficient indices for Perception of Teachers of Professional and General Degree Colleges about Web-based Learning – 0.72
- Reliability of correlation coefficient indices for Perception of Students of Professional and General Degree Colleges about Web-based Learning – 0.69
- Reliability of correlation coefficient indices for Uses of Web-based Learning among Teachers of Professional and General Degree Colleges – 0.67
- Reliability of correlation coefficient indices for Uses of Web-based Learning among Teachers of Professional and General Degree Colleges – 0.69

5.1.13 Procedure of Data Collection

1. After the random selection of the colleges, the researcher visited the computer centre or ICT centre to get information about the availability of web-based learning resources with the help of a checklist cum observation schedule.
2. Henceforth, for the collection of data from teachers and students, proper and clear instruction was given before administering the questionnaires and rating scales. They were informed about the confidentiality of their profile and responses to the question. The rationale of the research was explained to them with full understanding, and they were encouraged not to hesitate to give answers or their opinions. After giving all the necessary instructions, a tool was distributed, and the respondents started giving responses.

5.1.14 Statistical Techniques for Data Analysis

The data was analyzed by using MS Excel and SPSS. Statistical techniques such as percentage, and frequency were used to analyze data for research objectives 1 and 2. To compare two or more groups, as the data was on an ordinal level; the Mann-Whitney U test and the Kruskal-Wallis test were used.

5.2 Major Findings of the Study

5.2.1 Findings regarding Web-Based Learning Resources provided to the Teachers and Students of Professional Colleges in Mizoram

1. VSAH had a computer laboratory with 20 sets of computers. The college was equipped with internet connectivity and VSAT. The photocopier machine was accessible; no other resources were reported as available during the time of data collection, providing 2Mbps of broadband internet and Voice Over Internet Protocol (VoIP) Connectivity.
2. NEILIT, formerly known as DOEACC, had more than 200 computers, 20 classrooms were designed as smart classrooms, the institution had 2 video conferencing rooms, and resources such as printers (2), and photocopier machines (3) were accessible. The institution had internet and intranet

connectivity in VSAT, NKN, Radio link, BSNL, and NextCom were the available networks. All classrooms were ergonomically furnished, and projectors were installed. NEILIT had subscribed to the Online IEEE Xplore Digital Library.

3. IASE had a computer centre along with 20 sets of computers. The 10 projectors were installed for educational purposes. An INFLIBNET service was available, and a web-based language teaching platform like SANAKO was available in the institution. Google Classroom and Zoom were the most used apps for academic interaction during the COVID-19 pandemic.
4. GMLC had a computer room along with 20 sets of computers and a language laboratory having 10 sets of computers. Internet connectivity was available, and each classroom had wall-mounted projectors.
5. RIPANS had an e-resources centre, along with 20 sets of computers. Web-OPAC interface was available, library software like KOHA was accessible, and Radio Frequency Identification (RFID) was also provided in the library.

5.2.2 Findings regarding Web-based Learning Resources provided to the Teachers and Students of General Degree Colleges in Mizoram

1. Government Saiha College had internet connectivity for faculty; smart classrooms were under construction during the time of data collection, which was under the RUSA project. The computer centre and language laboratory were available with 10 sets of computers each, and 10 laptops were available for faculty. During the COVID-19 pandemic, Google Meet and Zoom were the most common platforms used for academic interaction, and e-resources were under process for accessibility at the time of data collection. One (1) projector was installed in the college seminar hall.
2. Government Lawngtlai College computer center-cum-e-resource centre was available, having 15 sets of computers. Other resources like projectors (8), television (1), digital camera (2), printers (5), photocopier machine (1), scanner (1) were available in the institution. Google Meet, Zoom, Google Classroom and WhatsApp were used for academic purposes during the

COVID-19 pandemic. A memorandum of understanding was signed between the Jio Company and the college to link the internet. In this connection, a Jio signal tower was installed, enabling all staff members and students to access the internet for free.

3. Government J. Buana College had a computer laboratory having 20 sets of computers. Wi-fi was connected in each classroom. The institution had 2 smart classrooms, 6 projectors, and a seminar hall equipped with digital resources. The N-list was accessible in the institution. Google Meet, Google Forms, and WebEx were the most used apps for academic purposes during the COVID-19 pandemic.
4. Lunglei Government College had a computer room with 15 sets of computers. Internet connectivity was available in which N-list was accessible. E-resources such as projectors (13), televisions (2), digital camera (1), printers/scanners (3), and photocopier machines (2) were provided. During the COVID-19 pandemic, various software applications like Zoom, Google Meet, Google Classroom and WebEx were used for academic purposes.
5. Government Kolasib College had a computer centre with 50 sets of computers. Internet connectivity was available in which INFLIBNET and N-List were accessible. There were 3 projectors in the institution. Specific software such as SANAKO, ORACLE 10G, 8085 Simulator, VISUAL BASIC 2010, Ubuntu and Turbo C were provided to the teachers and students of Government Kolasib College.
6. Government Champhai College had an Internet resource centre having 15 sets of computers. The college had a computer science laboratory having 30 sets of computers and a geography laboratory having 10 computers. Core classrooms (10) were well furnished and had a smartboard. Internet connectivity was available, and INFLIBNET and N-List were accessible. Specific software such as Oracle, VB, Turbo C, C++, Tally, Emulator and Ubuntu were provided to the teachers and students. Application software like Google Meet and Google Classroom were used for educational purposes during the COVID-19 pandemic.

7. Government Serchhip College had an internet resource centre having 45 sets of computers, there were 10 laptops and 11 projectors; the college had 6 smart classrooms. Internet connectivity was available, in INFLIBNET and N-List were accessible. Academic platforms like the National MOOC platform, SWAYAM and NPTEL were provided in the institution. Google Classroom, Google Meet, Zoom, YouTube and WhatsApp were the most used application software during the COVID-19 pandemic. The teachers and students of Government Serchhip College used specific software such as SUSE, Kubuntu, Ubuntu, Linux, Oracle Studio and SANAKO.
8. Government T. Romana College had a computer centre having 18 sets of computers, and a language laboratory having 20 computers. Each department in the college had a laptop (8). There were 10 projectors, 1 television, 6 printers, 2 photocopier machines and 2 scanners. Internet connectivity was available in which INFLIBNET and N-List were accessible. Google Meet and WebEx were the most-used application software during the COVID-19 pandemic.
9. Government Aizawl College had an internet resource centre and a language laboratory set up, having 20 computers in each centre. There were 9 laptops provided for each department, 7 printers and 20 projectors. Internet connectivity was available through which INFLIBNET, N-List, National Digital Library of India were accessible. A specific software; Tally was used by the commerce department.
10. Government Hrangbana College had an internet resource centre that was set up having 30 sets of computers, and a language laboratory was also available having 20 sets of computers; SANAKO learning software was used in the language laboratory. Each classroom had projectors (20). Internet connectivity was available in which INFLIBNET, N-List, National Digital Library of India were accessible. Various software applications such as Google Classroom, Google Meet and Zoom were used during the COVID-19 pandemic for educational purposes.
11. Pachhunga University College had a computer centre and a language laboratory having 30 sets of computers in each. Internet connectivity was

available in which N-List and Internet Cell of Library were accessible. Specific software like Tally was used. There were 38 projectors in the institution. Google Classroom and Zoom were used during the COVID-19 pandemic.

12. Government Zirtiri Residential Science College had a computer centre-cum-language laboratory having 20 sets of computers. Other than that, there were 88 computers and 19 projectors available for academic purposes. Internet connectivity was available, through which INFLIBNET and N-List were accessible. SANAKO software was provided in the language laboratory.

5.2.3 Discussion regarding Web-Based Learning Resources provided to the Teachers and Students of Professional and General Degree Colleges in Mizoram

The primary aim of this study was to assess the availability of web-based learning resources in professional and general degree colleges in Mizoram. The researcher discovered significant disparities in the availability of web-based learning resources between the two types of colleges. Variations in locality, student population, and the range of disciplines offered by the institutions, were identified as the primary reasons for the differences in resource availability in the institutions.

It could be discussed that there were computer centres or e-resource centres in all professional and general degree colleges. However, the capacity of e-resource centres and the availability of computers were very limited. All the institutions had internet access, which allowed e-resources, specialized software, and other technical assistance to be accessible following the requirements of the various institutions. Connectivity and infrastructure-related issues needed to be sorted out in order to motivate teachers and students to make use of web-based resources. The above finding was similar to the findings of Pandey et al. (2016), who stated that online materials and infrastructures were requisite to encourage students to study further. Gadgets like projectors, photocopier machines, and printers were available for

educational purposes in the majority of institutions. However, other institutions, such as professional colleges and general degree colleges, did not have sufficient e-resources. The finding was supported by the study of Dankaro (2012), who expressed that teacher educators could not access instructional development and insisted on having well-equipped ICT resources. The overall results also showed that not all the e-resources were satisfactory and readily available, which is the reason why teachers and students could not access the internet in times of need. This finding was in agreement with the findings of Uma & Kavitha (2021). The investigators found that each institute was trying to improve its web-based facilities to catch up with the technological advancements globally, which was similar to the findings of Pande et al. (2016).

5.2.4 Findings regarding Web-Based Learning Resources accessed by the Teachers of Professional and General Degree Colleges in Mizoram

- 1) The majority (64%) of teachers from professional colleges used a computer or laptop for more than 10 years, while 51% of teachers from general degree colleges had used one for over 10 years. In total, 54% of the college teachers in Mizoram had used a computer or laptop for over a decade.
- 2) Among the professional colleges, the majority (92%) of the teachers had used a smartphone for more than 5 years, while 84% of the teachers from the general degree colleges had also used a smartphone for more than 5 years. Overall, 86% of college teachers in Mizoram had used smartphones for more than 5 years.
- 3) In professional colleges, the majority (88%) of teachers used the internet to update their knowledge, compared to 87% in general degree colleges. Thus, it could be concluded that 87% of college teachers in Mizoram relied on the internet for knowledge updates. The research included options such as recreational use, lecture preparation, knowledge updates, and research work.
- 4) A majority (90%) of the teachers from professional colleges had access to the internet 'every day'; simultaneously, 89% of the teachers from general degree

colleges had access to the internet 'every day'. Therefore, it means that the majority (90%) of the college teachers in Mizoram had access to the internet every day.

- 5) Among the professional college teachers in Mizoram, the majority (92%) accessed the network in the institution, while the majority (89%) of the general degree college teachers did the same. Thus, it was clear that the majority (94%) of the college teachers in Mizoram used their institutional network.
- 6) All the professional college teachers used the WhatsApp social media platform, while 96% of general degree college teachers preferred it. It can be stated that WhatsApp was the most used (97%) social media platform by college teachers in Mizoram. Other options included Instagram, Facebook, YouTube, Twitter, and Telegram.
- 7) To get information related to teaching and other areas, Wikipedia was the website that teachers frequently visited, with 64% of professional college teachers and 45% of general degree college teachers. Thus, Wikipedia was the most visited (50%) website and academic platform by college teachers in Mizoram. Other platforms listed were LinkedIn, Academia.edu and ResearchGate.
- 8) Google Meet was the most used (92%) app for online academic interaction by teachers of professional colleges, while Zoom was the most used (89%) app for online academic interaction by teachers of general degree colleges. However, Zoom was the most used (89%) app for online academic interaction by college teachers in Mizoram. Other options included Google Classroom and WebEx.
- 9) The majority (68%) of professional college teachers did not have personal online accounts beyond social media, and 59% of general college teachers lacked such accounts. Thus, the majority (61%) of the college teachers in Mizoram did not maintain personal online spaces outside social networking sites.
- 10) All the professional college teachers used the Google search engine, and 99% of the general degree college teachers also used the Google search engine.

Hence, nearly all (99%) of the college teachers in Mizoram used the Google search engine to explore the internet. Other search engines that were among the possible choices for this question were Yahoo and UC Browser.

- 11) A majority (76%) of the teachers from professional colleges learned about online sources from media outlets, compared to 70% of general degree college teachers. It can be concluded that the majority (71%) of the college teachers in Mizoram discovered online resources from the media. Options for awareness of online sources included friends and colleagues, family and institutions.
- 12) The majority (76%) of the professional college teachers and general degree college teachers stated that their institution organized an orientation programme on the use of web-based learning or ICT; concurrently, the majority (76%) of the college teachers in Mizoram stated that their institution organized an orientation programme on web-based or ICT.
- 13) The majority (52%) of professional college teachers rated their computer knowledge as 'average'. The same was found with general degree college teachers (54%). In total, the majority (53%) of college teachers considered their computer skills 'average'.
- 14) The majority (76%) of the teachers from professional colleges had a 'medium' ability in handling web-based facilities or ICT, while 73% of the teachers from general degree colleges also shared this level. It was found that the majority (74%) of college teachers in Mizoram had a 'medium' ability to handle web-based facilities or ICT for teaching-learning purposes.
- 15) The majority (56%) of the professional college teachers preferred the conventional type of teaching; 60% of the general degree college teachers preferred the conventional type of teaching, and the majority (59%) of college teachers in Mizoram preferred the conventional or traditional type of teaching rather than modern or contemporary teaching, i.e. use of ICT or web-based facility.
- 16) All the professional college teachers 'always' used MS Office; 80% of the general college teachers 'always' used MS Office, and the majority (85%) of the college teachers in Mizoram 'always' used MS Office application

software. The options provided for this question included media players, accounting software, web conferencing, anti-virus software, graphic design software, and digital audio workstations.

- 17) The majority (64%) of the professional college teachers were 'excellent' in using MS Office; 57% of the general college teachers were 'good' in using MS Office, and the majority (50%) of the college teachers in Mizoram had 'excellent' proficiency in using MS Office.
- 18) The majority (92%) of the teachers from the professional colleges 'always' used Windows system software; 79% of the teachers from general degree colleges 'always' used Windows. So, it was clear that the majority (82%) of the college teachers in Mizoram 'always' used Windows. Linux, iOS, Android, and Macintosh were also included in the given preferences.
- 19) The majority (56%) of the teachers from professional colleges were 'good' in using Windows; 61% of the teachers from general degree colleges shared this proficiency; and the majority (60%) of the college teachers in Mizoram had 'good' proficiency in using Windows system software.
- 20) The majority (80%) of the teachers from professional colleges attended an educational online programme or live telecast lectures; 83% of the teachers from general degree colleges attended the educational online programme, as a result, 82% of the college teachers in Mizoram attended online educational programme or live telecast lectures in their institutions.
- 21) Among the professional college teachers, 36% of them rated their web-based facilities as 'inadequate' and another 36% considered them 'moderate', 54% of the general college teachers rated them 'moderate'. However, 50% of the college teachers in Mizoram described their web-based facilities as 'moderate'.
- 22) Out of 25 professional college teachers, the majority (88%) of teachers had network or internet connection failure during online classes; out of 82 general college degree teachers, 88% of them had network or internet connection failure during online classes. Among the 107 college teachers in Mizoram, 88% of teachers had experienced network or internet connection failures during online classes. Motivating students, tracking students' work or

assignments, lack of computer literacy skills, problems in handling online interfaces, and time management were included among the problems faced during online classes.

- 23) The majority (72%) of the teachers from professional colleges preferred hardcopy submissions for assignments, 66% of the general degree college teachers wanted students' assignments in hardcopy, and the majority (67%) of the college teachers in Mizoram wanted assignments in hardcopy.
- 24) The majority (64%) of professional college teachers conducted online classes 'a few times in a week' during the pandemic; 65% of the general degree college teachers took 'a few times a week' online classes, and 65% of the college teachers in Mizoram took online classes 'a few times a week' during the COVID-19 pandemic.
- 25) Among the professional college teachers, 40% were 'slightly satisfied' with online classes during the pandemic; 50% of the general degree college teachers were 'satisfied' with online classes. Out of the 107 college teachers in Mizoram, 47% of teachers expressed 'satisfied' with taking online classes during the COVID-19 pandemic.
- 26) The majority (64%) of the professional college teachers were 'very satisfied' with the coverage of courses and 54% of the teachers from general degree colleges were also 'very satisfied'. The majority (66%) of the college teachers were 'very satisfied' with covering their course or syllabus during the COVID-19 pandemic.

5.2.5 Discussion regarding Web-Based Learning Resources accessed by the Teachers of Professional and General Degree Colleges in Mizoram

In Mizoram, the majority of college teachers used computers or laptops for over 10 years and smartphones for more than 5 years. This aligned with the findings of Puspitasari et al. (2018), which highlighted the role of technology, such as computers, smartphones, and internet connection, for web-based learning tools. The college teachers in Mizoram accessed the internet daily to update their knowledge, and prepare for lectures, leisure

activities, and research work, similar to the findings of Pande et al. (2016). WhatsApp was the most popular social media platform among college teachers in Mizoram, followed by YouTube, Facebook, Instagram, Telegram, and Twitter. These preferences for social media as a blended learning tool corroborate Selvaras (2019) findings on technology adoption in open and distance learning contexts within Sri Lanka. Wikipedia was the most visited academic platform, though it fell short of fully meeting educational demands. Other platforms like ResearchGate, Academia.edu, and LinkedIn were less frequently used. The COVID-19 pandemic led to the introduction of online academic interaction between teachers and students, with Zoom being the most used online platform for academic interaction, followed by Google Meet, Google Classroom, and WebEx. Almost all teachers used the Google search engine to explore the internet, and many learned about online sources through media. While most teachers rated their computer proficiency as 'average' and their web-based facility handling as 'medium', orientation programs on ICT use were conducted, echoing Kakar & Majula (2022) emphasis on training needs. The result also showed that most teachers preferred conventional or traditional types of teaching to modern or contemporary teaching i.e. use of ICT or web-based facilities for teaching. MS Office was the most popular application software used by teachers, and Windows was the most common system software used by them. It was discovered that teachers lacked advanced expertise in utilizing these application software and system software, as they were not familiar with them. This finding also concurred with the findings of Thangamani and Nagavalli (2017), stating that student teachers had an average attitude towards ICT but did not have proficiency in using it. The majority of the teachers participated in online educational programmes or live telecast lectures at their respective colleges. Half of the respondents evaluated their web-based facilities as moderate. There are many problems faced during online classes - motivating students, tracking students' work or assignments, teachers lacking computer literacy skills, network or internet connection failures, handling online interfaces, and time management. This particular finding concurred

with the findings of Ayoub et al. (2020) in their study relating to the flexibility and capacity for learning as web-based learning was self-paced. The majority of the teachers preferred to get assignments from students in hard copy. The COVID-19 pandemic hinders regular class engagement. As a result, many teachers participated in online classes a few times a week, and many expressed satisfaction with how the courses covered their subject matter and syllabus. The result indicated that effective training on the use of web-based resources or ICT needs to be done for college teachers.

5.2.6 Findings regarding Web-Based Learning Resources accessed by the Students of Professional and General Degree Colleges in Mizoram

- 1) Out of the 278 students from the professional colleges, the majority (77%) owned a computer or laptop, whereas, among the 1625 general degree college students, 53% did not have a computer or laptop. However, the majority (51%) of college students in Mizoram owned a computer or laptop.
- 2) Among the professional college students, 45% of them had used a computer or laptop for over 1-5 years; 58% of the students in the general degree colleges had used a computer or laptop for over 1–5 years. The majority (56%) of college students in Mizoram had used computers or laptops for 1-5 years.
- 3) Out of 278 students from the professional colleges, 62% had used a smartphone for more than 5 years, out of 1625 students from the general degree colleges, 48% of them had used a smartphone for more than 5 years. Out of the 1903 students, 50% of the college students of Mizoram had used smartphones for more than 5 years.
- 4) Out of the 278 students from professional colleges, the majority (80%) of them used the internet for educational purposes; meanwhile, out of the 1625 students from the general degree college, the majority (74%) of them used the internet for updating their knowledge. Thus, out of the 1903 college students, 75% of them used the internet to update their knowledge.

- 5) The majority (89%) of the professional college students accessed the internet 'every day', 71% of the general degree college students accessed the internet 'every day', and the majority (74%) of college students in Mizoram accessed the internet 'every day'.
- 6) The majority (61%) of professional college students did not access the network in their institutes; 65% of general degree college students did not access the network in their institutes, and the majority (65%) of college students did not access the network from institutions.
- 7) WhatsApp was the most used (97%) social media platform for online academic interaction by professional college students; 91% of the general degree college students used WhatsApp social media for academic interaction, and WhatsApp was the most used (92%) social media for academic interaction by college students in Mizoram.
- 8) Wikipedia was the most visited (51%) website by professional college students for educational purposes; at the same time Wikipedia was the most visited (27%) website by general degree college students for educational purposes, and again, among the college students in Mizoram, Wikipedia was the most visited (30%) website for educational purposes.
- 9) Google Meet was the most used (75%) app for online academic interaction by students of professional colleges, while Zoom was the most used (66%) app for online academic interaction by students of general degree colleges. However, Zoom was the most used (66%) app for online academic interaction by college students in Mizoram.
- 10) The majority (91%) of the professional college students did not have a personal online account other than social networking sites; 76% of the general college students also did not have a personal online space. Thus, the majority (78%) of the college students in Mizoram did not have personal online space other than social networking sites.
- 11) The majority (99%) of the professional college students used the Google search engine, and 99% of the general degree college students also used the Google search engine. Almost all (99%) of the college students in Mizoram used the Google search engine for exploring the internet.

- 12) The majority (76%) of the students from professional colleges came to know online sources from media outlets; 60% of the students from general degree colleges also came to know online sources from media outlets. The majority (61%) of the college students in Mizoram learned about online resources from the media.
- 13) The majority (67%) of the students from the professional colleges stated that their institution organized an orientation programme on the use of web-based learning or ICT. Meanwhile, among general degree colleges, 75% of them stated that their institution organized an orientation programme on web-based, and the majority (74%) of the college students in Mizoram responded that their institution organized an orientation programme on the use of web-based or ICT.
- 14) Among the professional college students, 55% of them had 'average' proficiency in using a computer; among the general degree college students, 44% of them had 'average' proficiency in using a computer. Thus, out of the 1903 college students in Mizoram, 46% of them had 'average' proficiency in using a computer.
- 15) Among the professional college students, 67% of them had 'medium' ability in handling web-based facilities or ICT for teaching and learning; 77% of the general degree college students had 'medium' ability in handling web-based facilities or ICT. In the meantime, the majority (76%) of the college students had 'medium' ability in handling web-based facilities or ICT in teaching and learning.
- 16) The majority (57%) of professional college students preferred modern or contemporary types of learning, while the majority (61%) of the general degree college students preferred conventional or traditional types of learning. However, the majority (58%) of the college students in Mizoram preferred a conventional or traditional type of learning.
- 17) The majority of students used MS Office 'sometimes'. In terms of percentage, 53% of professional college students, 51% of general degree college students and out of the 1903 college students in Mizoram, 51% of students used MS Office 'sometimes'.

- 18) The majority (61%) of the professional college students were 'good' in using MS Office; 55% of the general degree college students were 'good' in using MS Office, and the majority (56%) of college students in Mizoram had 'good' proficiency in using MS Office.
- 19) The majority (60%) of the students in the professional college 'always' used Windows, while 44% of the general college students 'sometimes' used Windows. Among the 1903 college students in Mizoram, 43% used Windows 'sometimes'.
- 20) The majority (55%) of the professional college students were 'good' in using Windows system software; 48% of the general degree college students were also 'good' in using Windows. Among the 1903 college students in Mizoram, 49% of students had 'good' proficiency in using Windows.
- 21) The majority (74%) of the students from the professional college attended educational online programmes or live telecast lectures; 92% of the students from the general degree college attended educational online programmes, and the majority (89%) of the college students in Mizoram attended educational online programmes or live lectures in their institutions.
- 22) The majority (58%) of the professional college students rated their web-based facilities as 'moderate', 67% of the general degree college students rated their web-based facilities as 'moderate', and the majority (65%) of the college students from both colleges rated the web-based facilities in their institutions as 'moderate'.
- 23) Out of 278 students from the professional college, the majority (72%) of them experienced network or internet connection failure during online classes; out of 1625 general college degree students, 74% of them experienced network or internet connection failure during online classes. Among the 1903 college students in Mizoram, 74% of teachers had experienced network or internet connection failures during online classes. Motivating students, tracking students' work or assignments, lack of computer literacy skills, problems in handling online interfaces, and time management were among the problems faced during online classes by college students.

- 24) The majority (55%) of the students from professional colleges preferred submitting their assignment in softcopy, 57% of the general degree college students to submit in softcopy, and the majority (57%) of the college students in Mizoram wanted to submit their assignments in softcopy.
- 25) The majority (62%) of the professional college students attended their classes 'every day' during the pandemic; 72% of the general degree college students also attended online classes 'every day', and 70% of college students of Mizoram attended online classes 'every day' during the COVID-19 pandemic.
- 26) Among professional college students, the majority (45%) were 'slightly satisfied' with online classes during the pandemic, while the majority of general degree college students (39%) were 'satisfied' with online classes. Though it was the majority, out of the 1903 college students in Mizoram, only 38% of them were 'satisfied' with taking online classes during the COVID-19 pandemic.
- 27) Among the students at professional colleges, 38% of them were 'satisfied' with the coverage of courses, 40% of the students from general degree colleges were also 'satisfied', and 40% of the college students in Mizoram were 'satisfied' in covering their course or syllabus during the COVID-19 pandemic.

5.2.7 Discussion regarding Web-based Learning Resources accessed by the Students of Professional and General Degree Colleges in Mizoram

This study focused on the usage of web-based learning resources among students in professional and general degree colleges in Mizoram. The majority of students owned computers or laptops, which they had been using for 1 to 5 years, and half of the respondents had been using smartphones for over 5 years. Most college students accessed the internet daily to update their knowledge and being engaged in educational and recreational activities, entertainment, and in search of job. Many students accessed to campus networks. The most used social media platform for online academic

interaction had been WhatsApp, followed by YouTube, Instagram, Facebook, Twitter, and Telegram. Engaging in certain social media activities had had a positive impact on their studies, which was consistent with the findings of Schindler et al. (2017), indicating a higher return on academic results. For educational purposes, Wikipedia had been the most visited website, followed by Academia.edu and ResearchGate. During the COVID-19 pandemic, Zoom was the most popular app used by students, followed by Google Meet, Google Classroom, and WebEx. The majority of students did not have personal online spaces and preferred the Google search engine. Many students learned about online sources from the media and mentioned that their institutions organized orientation programs on web-based or ICT. However, they only had average basic computer knowledge for their educational assistance. College students in Mizoram also stated that they had a moderate ability to handle web-based facilities or ICT for teaching and learning. Most students preferred conventional learning over modern or contemporary learning, such as the use of ICT or web-based resources. They were familiar with the MS Office application software and proficient in using it, as well as familiar with the Android system software. Most college students attended online educational programs or live telecast lectures at their respective institutions and rated the web-based facilities provided by their colleges. During online classes, students encountered issues such as network or internet connection failures, lack of motivation, and time management, which were also common setbacks found in the study of Dost et al. (2020). Most students preferred to submit their assignments using soft copies. During the COVID-19 pandemic, regular classes continued using different online modes, and the majority of the students attended online classes every day and expressed satisfaction with the classes and the coverage of their syllabus and courses. The study highlighted the need for proper orientation or hands-on experience to be introduced among the students.

5.2.8 Findings regarding the Perception of Teachers of Professional and General Degree Colleges in Mizoram about Web-based Learning

- 1) Out of 25 teachers from the professional colleges in Mizoram, the majority (48%) of students had a ‘moderately positive perception’ of web-based learning.
- 2) Out of 82 teachers from the general degree colleges in Mizoram, the majority (57%) of teachers had a ‘moderately positive perception’ on web-based learning.
- 3) Among 107 college teachers in Mizoram, the majority (55%) of the teachers had a ‘moderately positive perception’ of web-based learning.

5.2.9 Findings regarding the Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning

- 1) Among 278 students of the professional colleges in Mizoram, the majority (60%) of the students had a ‘moderately positive perception’ of web-based learning.
- 2) Among 1625 students from the general degree colleges in Mizoram, the majority (63%) of the students had a ‘moderately positive perception’ of web-based learning.
- 3) Out of 1903 students from different colleges in Mizoram, the majority (62%) of the students had a ‘moderately positive perception’ of web-based learning.

5.2.10 Discussion regarding the Perception of Teachers and Students of Professional and General Degree Colleges in Mizoram about Web-based Learning

The findings revealed that teachers in both professional colleges and general degree colleges in Mizoram held a moderately positive perception of web-based learning and improved their performance in the use of web-based learning, which the study of Thangamani and Nagavalli (2017), Popicivi and Mironov (2015) supported a similar finding. One possible explanation of this

finding could be that teachers and students nowadays are advanced in using innovative technology and have a deep understanding of the concept of web-based learning. They were deeply aware of the transition made by digital technologies and seemed to understand that a more rational advance based on specific developments might prove even more effective. A similar result was found in the research of Vahedi et al. (2019), stating that a positive perception was identified in their research incorporating information and communication technology in the classroom. However, some students had negative attitudes with regard to policies that would confine the use of web-based technology in the classroom. One key element contributing to the success of web-based teaching and learning was the integration of ICT tools and facilities (Ghavofekr & Rosdy, 2015).

5.2.11 Findings regarding the Uses of Web-Based Learning among Teachers of Professional and General Degree Colleges in Mizoram

- 1) The majority (68%) of the teachers from professional colleges ‘always’ used the Internet for self-study; 63% of the teachers from the general degree colleges ‘always’ used the Internet for self-study, and the majority (64%) of the college teachers in Mizoram ‘always’ used the internet for self-study.
- 2) The majority (64%) of the teachers from professional colleges ‘always’ encouraged students to use web-based learning; 46% of the teachers from general degree colleges ‘always’ encouraged students to use web-based learning, and 50% of the college teachers in Mizoram ‘always’ encouraged their students, and the remaining 50% of them ‘sometimes’ urged their students to use web-based learning.
- 3) Among the professional colleges, the majority (68%) of the teachers ‘sometimes’ consulted e-textbooks for supplementary knowledge; the majority (73%) of the teachers from the general degree college ‘sometimes’ consulted e-textbooks, and the majority (72%) of the college teachers in Mizoram ‘sometimes’ consulted e-textbook.

- 4) The majority (60%) of the teachers from professional colleges ‘always’ downloaded pictures and diagrams for teaching; 61% of the teachers from the general degree colleges ‘sometimes’ downloaded pictures and diagrams for teaching, and the majority (56%) of the college teachers in Mizoram ‘sometimes’ downloaded picture diagrams for teaching.
- 5) The majority (68%) of the teachers from the professional college ‘sometimes’ preferred the transfer of learning materials through email or online to their students, and 55% of the teachers from general degree colleges ‘sometimes’ preferred to transfer materials through email or online to their students, and the majority (58%) of the college teachers in Mizoram ‘sometimes’ preferred the transfer of materials through email or online to their students.
- 6) The majority (64%) of the teachers from the professional colleges ‘sometimes’ used web-based learning comfortably; the majority (56%) of teachers from the general degree colleges ‘sometimes’ used web-based learning comfortably, and the majority (58%) of the college teachers ‘sometimes’ used web-based learning comfortably.
- 7) The majority (76%) of the teachers ‘sometimes’ used different educational blogs and social media for academic interaction; at the same time, the majority (73%) of the teachers from general degree colleges ‘sometimes’ used different educational blogs and social media for academic interaction, and the majority (74%) of college teachers ‘sometimes’ used different educational blogs and social media for academic interaction.
- 8) The majority (64%) of the teachers from professional colleges collected materials through the internet ‘sometimes’, and the majority (65%) of teachers from general degree colleges ‘sometimes’ collected materials through the internet. Thus, the majority (64%) of the college teachers in Mizoram ‘sometimes’ collected materials through the internet.
- 9) Among the teachers from professional colleges, the majority (64%) of them ‘sometimes’ suggested e-content as supplementary reading materials and the majority (79%) of the teachers ‘sometimes’ suggested e-content as supplementary reading materials. It was clear that the majority (76%) of the

college teachers in Mizoram ‘sometimes’ suggested e-content as supplementary reading materials.

- 10) The majority (60%) of the teachers from professional colleges ‘always’ visited various links or websites that would help them in their teaching. Among the teachers of general degree colleges in Mizoram, the majority (61%) of the teachers ‘sometimes’ visited various links or websites related to their syllabus or course to improve their knowledge. Among the college teachers in Mizoram, the majority (56%) of the college teachers ‘sometimes’ visited various links or websites related to their syllabus or course.
- 11) The majority of teachers (64%) in Mizoram reported that they sometimes used internet resources related to their syllabus or course content. Specifically, 63% of teachers from general degree colleges reported the same. This suggested that a majority of college teachers in Mizoram made use of the internet as a resource from time to time.
- 12) The majority (64%) of the teachers from the professional colleges ‘sometimes’ preferred the online submission of assignments. Among the general degree colleges, the majority (54%) of the teachers ‘sometimes’ preferred the online submission of assignments. It was evident that the majority (56%) of the college teachers in Mizoram ‘sometimes’ preferred the online submission of assignments.
- 13) The majority (52%) of the teachers ‘sometimes’ used the different types of audio-video materials for updating their knowledge. Among the general degree colleges, the majority (61%) of the teachers ‘sometimes’ used the different types of audio-video materials in updating their knowledge. It could also be seen that the majority (59%) of the college teachers ‘sometimes’ used different types of audio-video materials to help them update their knowledge.
- 14) The majority (56%) of teachers from professional colleges ‘always’ used the e-groups within the class for making announcements and arrangements for meetings; and the majority (55%) of the teachers from general degree colleges ‘sometimes’ used the e-groups within the class for announcements and arrangement for meetings. Among the college teachers in Mizoram, the majority (51%) of the teachers ‘sometimes’ used the e-group within the class

for announcements and arrangements for meetings since it was convenient to share information through e-groups.

- 15) The majority (60%) of professional college teachers ‘sometimes’ used web-based learning to overcome inferiority complex; on the other hand, the majority (77%) of the teachers from general degree colleges ‘sometimes’ used web-based learning to overcome inferiority complex. Among the college teachers in Mizoram, the majority (73%) of the college teachers ‘sometimes’ used web-based learning to overcome their inferiority complex.

5.2.12 Discussion regarding the Uses of Web-based Learning among Teachers of Professional and General Degree Colleges in Mizoram

The study found that many college teachers in Mizoram frequently used the internet for self-study and encouraged their students to utilize web-based learning. They often used e-books, downloaded pictures and diagrams for teaching, and preferred to provide resources to their students through email or other online platforms. Some of the teachers occasionally used social media and educational blogs for academic interaction, in addition to using web-based learning with ease. They also browsed various links and websites related to the course curriculum for additional reading and sometimes used online course content due to its high quality and easy availability. The difference regarding the perspective and educational background of professional and general degree colleges might have led to visiting various links or websites. The study also found that some teachers were in favour of online assignment submissions.

While communicating with their students, most teachers found that web-based learning helped them overcome an inferiority complex since some of them had difficulties expressing themselves before many audiences. Many responses frequently used audio-video resources to stay updated with current data and information and utilized class e-groups for announcements and meeting schedules.

The investigator noted that many responses ended with ‘sometimes’ or ‘occasionally’ because the respondents were hesitant to address significant issues regarding the utilization of web-based learning in their institutions. Additionally, the investigator observed that teachers might have been reluctant to adopt technology due to inadequate equipment, lack of proper training, poor administrative support, slow internet speeds, lack of confidence, and absence of expert technical staff, leading to doubts about the effectiveness of web-based resources.

5.2.13 Findings regarding the Uses of Web-based Learning among Students of Professional and General Degree Colleges in Mizoram

- 1) The majority (57%) of the students from professional colleges ‘sometimes’ used the internet for self-study, and the majority (61%) of the students from general degree colleges ‘sometimes’ used the internet for self-study. It was clear that the majority (61%) of the college students in Mizoram ‘sometimes’ used the internet for self-study.
- 2) The majority (73%) of students from professional colleges stated that web-based learning ‘sometimes’ motivated them in their studies, and the majority (67%) of students from general degree colleges said the same. Overall, 68% of college students in Mizoram felt motivated when using web-based learning in their studies.
- 3) It had been worth noting that among professional colleges, the majority (46%) of students had reported 'sometimes' consulting e-textbooks, while in general degree colleges, this number had risen to 68%. This had suggested that a majority of college students in Mizoram, 68% to be exact, 'sometimes' had consulted e-textbooks.
- 4) The majority (46%) of the students from professional colleges ‘sometimes’ downloaded pictures and diagrams, and 58% of students from the general degree college ‘sometimes’ downloaded pictures and diagrams. The majority (56%) of the students ‘sometimes’ downloaded pictures, and diagrams for their studies.

- 5) The majority (60%) of the students from professional colleges 'sometimes' preferred the transfer of material through email or online, and the majority (61%) of the students from general degree colleges 'sometimes' preferred to transfer their material through email or online. It was clear that the majority (61%) of the college students in Mizoram 'sometimes' preferred the transfer of material through email or online because of their teachers and classmates.
- 6) The majority (57%) of the students in professional colleges 'sometimes' used web-based learning comfortably, and among the general degree colleges, the majority (61%) of the students 'sometimes' used web-based learning comfortably. It was found that the majority (61%) of the college students in Mizoram 'sometimes' used web-based learning comfortably.
- 7) The majority (67%) of the students from professional colleges 'sometimes' used different educational blogs and social media for academic interaction, and among the general degree colleges, 68% of the students 'sometimes' used different educational blogs and social media for academic interaction. It was evident that the majority (68%) of the college students in Mizoram 'sometimes' used different educational blogs and social media for academic interaction.
- 8) The majority (59%) of the students from professional colleges 'sometimes' collected learning materials from the internet; the majority (64%) of the students from general degree college 'sometimes' used the internet for collecting learning materials, and the majority (63%) of them 'sometimes' collected learning materials from the internet.
- 9) The majority (71%) of the students from professional colleges 'sometimes' used e-content as supplementary reading resources; the majority (75%) of the students from general colleges 'sometimes' used e-content as supplementary reading resources and the majority (74%) of the students 'sometimes' used e-content as supplementary reading resources.
- 10) The majority (62%) of students from professional college 'sometimes' visited the links or websites related to their syllabus or course to obtain the reading materials; 59% of students from general college 'sometimes' visited the links or websites related to their syllabus or course. However, the majority (59%)

of the college students in Mizoram ‘sometimes’ visited the links or websites related to their syllabus or course.

- 11) The finding had revealed that the majority (69%) of students from professional colleges had reported using the internet ‘sometimes’ to access high-quality content related to their course or syllabus. Similarly, among the general degree colleges, 67% of students had indicated that they ‘sometimes’ had used the internet to access high-quality course-related content. Additionally, 67% of students from both types of colleges had reported using the internet ‘sometimes’ due to the good quality of course-related content available.
- 12) As per the data, a majority of professional college students (44%) indicated that they ‘sometimes’ preferred to submit their assignments online. Similarly, 47% of general college students also expressed a ‘sometimes’ preference for online assignment submission. Interestingly, among college students in Mizoram, 47% reported a ‘sometimes’ preference for online assignment submission.
- 13) Out of the 278 students from the professional college, the majority (50%) of the student ‘sometimes’ used different types of audio-video materials to update their knowledge, at the same time, out of the 1625 students from the general degree college, the majority (58%) of the students ‘sometimes’ used different types of audio-video materials to update their knowledge. Thus, out of the 1903 college students in Mizoram, the majority (57%) of the students ‘sometimes’ use different types of audio-video materials for updating their knowledge.
- 14) Among the professional colleges, the majority (56%) of the students ‘sometimes’ used e-groups to post necessary information, and among the students of general degree colleges, the majority (67%) of the students ‘sometimes’ used the e-groups within the class for announcement and arrangement for a meeting. Thus, among the college students, the majority (65%) of the college students ‘sometimes’ used the e-groups to make announcements and make arrangements for a meeting.

15) The majority (72%) of students from professional colleges ‘sometimes’ used web-based resources to overcome the inferiority complex, and the majority (71%) of the students from the general degree college ‘sometimes’ used web-based learning to overcome the inferiority complex. Thus, the majority (71%) of the students ‘sometimes’ used web-based learning to overcome their inferiority complex.

5.2.14 Discussion regarding the Uses of Web-Based Learning among Students of Professional and General Degree Colleges in Mizoram

The study reported that the majority of college students in Mizoram occasionally used the internet for self-study. It was reported by the students that adopting web-based learning usually inspired them to strive further in their studies. Pictures and diagrams were very much essential for a better and more concrete understanding of the content; they sometimes downloaded them for better learning and obtained the course materials from an e-book. Many students frequently opted to send assignments to their teachers and classmates via email or online, and at times, they had no trouble using web-based learning. Many students often utilise social media and various educational blogs for academic interaction in addition to gathering online resources for their coursework. The majority of the students find ICT convenient and appropriate, as it is easy to get supplementary learning materials and information from different links or websites with one click. They preferred to submit their assignments online. They frequently utilized the course and materials that were readily available online. The majority of them often overcame inhibitions while dealing with teachings by using web-based learning. Various audio-video resources were used to assist in maintaining focus in the classroom. Students usually set up meetings and make announcements via e-groups.

The investigator found that a large number of responses ended with ‘sometimes’ or ‘occasionally’ because the students who participated were unwilling to address the major issues about the usage of web-based learning

in the classroom environment. The investigator believed that students were refusing to use technology willingly due to limited accessibility, network connection, lack of teachers' competency and lack of motivation from teachers and parents.

5.2.15 Findings related to the comparison of the Perception of Teachers of Professional and General Degree Colleges in Mizoram about Web-based Learning

- Teachers of professional colleges had a higher perception than teachers of general degree colleges towards the use of web-based learning.

5.2.16 Discussion related to the comparison of the Perception of Teachers of Professional and General Degree Colleges in Mizoram about Web-based Learning

Curriculum relevance and integration of technology in professional colleges and general degree colleges could have been the reason why teachers of professional colleges had a higher perception than teachers of general degree colleges towards the use of web-based learning. Professional colleges often require online resources and digital platforms which were relevant and essential for their academic purposes. Meanwhile, general degree colleges frequently practiced traditional academic disciplines which could result in slower adaptation to the new technologies.

5.2.17 Findings related to the comparison of the Perception of Teachers of Professional and General Degree Colleges in Mizoram regarding Web-based Learning with reference to their Gender

- Female teachers had a higher positive perception of web-based learning than male teachers among professional and general degree colleges.

5.2.18 Discussion related to the comparison of the Perception of Teachers of Professional and General Degree Colleges in Mizoram regarding Web-based Learning with reference to their Gender

Female college teachers had a significantly more positive perception of the use of web-based learning compared to male college teachers. The reasons for this finding might have included the greater openness of female college teachers to new approaches, giving more emphasis to student-centred teaching, and placing value on flexibility and professional growth. This finding was similar to the findings of Jarald (2010), who stated that female teachers exhibited a more positive opinion regarding web-based learning.

5.2.19 Findings related to the comparison of the Perception of Teachers of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Discipline

- Teachers of computer application discipline had the highest positive perception regarding the use of web-based learning.
- Teachers of veterinary science discipline had the lowest positive perception regarding the use of web-based learning.

5.2.20 Discussion related to the comparison of the Perception of Teachers of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Discipline

Teachers of computer application discipline had the most positive perceptions of web-based learning due to their technological proficiency, the subject matter being aligned with online learning tools, their access to a wealth of resources, the opportunities for interactive and practical learning, and positive experiences.

When it came to technology, teachers in veterinary science fields might not have been as familiar with it as those in more technologically

focused fields. This may have had an impact on their capacity to produce interesting online material and use web-based learning resources efficiently.

5.2.21 Pair-wise comparison regarding the Perception of Teachers of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Discipline

The study revealed that-

- A significant difference (0.004) was found between teachers of veterinary science discipline and teachers belonging teacher education.
- A significant difference (0.008) was found between teachers of technology and teachers belonging teacher education.
- A significant difference (0.001) was found between commerce teachers and teachers belonging teacher education.
- A significant difference (0.004) was found between law teachers and teachers belonging teacher education.
- A significant difference (0.000) was found between teachers of arts discipline and teachers belonging teacher education.
- A significant difference (0.001) was found between science teachers and teachers belonging teacher education.

5.2.22 Discussion on pair-wise comparison regarding the perception of teachers of professional and general degree colleges in Mizoram about web-based learning with reference to their discipline

IASE is a teacher education institution with students and teachers from diverse disciplines. The teachers also had a variety of educational backgrounds, which helped them in using specific technologies. Their areas of specialization included instructional tactics, pedagogical ideologies, learning theories, and teaching technologies. This might have been the reason that teachers of teacher education had a significant difference as compared to other discipline teachers.

However, there was no significant difference among teachers of other disciplines, such as teachers of veterinary science, computer technology, commerce, law, arts, and science. Since web-based learning is closely related to the educational system nowadays.

5.2.23 Findings related to the comparison of the Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning

- Students of professional colleges had a higher perception than students of general degree colleges regarding the use of web-based learning.

5.2.24 Discussion related to the comparison of Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning

The connection of web-based learning with career goals, technology exposure, and institutional support could be seen as accountable factors for having a significantly high perception regarding the use of web-based learning among professional college students. These may have been the reasons why professional college students had a more positive perception in terms of the use of web-based learning than general college students. Students in general degree colleges, on the other hand, could have viewed web-based learning differently depending on a variety of criteria; they may have had doubts about the capacity of their online education, their ability to communicate with peers and teachers, and the legitimacy of their online credentials. The different perspective of web-based learning could have been the reason why the students of professional colleges had a higher perception than the general degree college.

5.2.25 Findings related to the comparison of the Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Gender

- Male students had a higher perception of web-based learning than female students among the professional colleges and general degree colleges.

5.2.26 Discussion related to the comparison of the Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Gender

Challenges and societal stereotypes that influenced the perceptions of technological ability; and inclusive educational and workplace environment could have been the reason why male students had a higher perception regarding web-based learning. Apart from these factors; a significant role in pursuing and succeeding in technology-related careers could also have been the explanation for why male students had a more positive perception of web-based learning than female students among the professional colleges and general degree colleges in Mizoram.

5.2.27 Findings related to the comparison of the Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Discipline

- Students of teacher education had the highest positive perception, and computer application students had the lowest positive perception of the use of web-based learning.

5.2.28 Discussion related to the comparison of the Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Discipline

The students of teacher education had a diverse educational setting that improved their ability to use particular technologies, and the attribute of

the institutional nature could have been the cause of the notable point why they had the ‘highest perception; of web-based learning. On the other hand, it was surprising to find that students of technology had a ‘low perception’ of web-based learning. The critical perspective might have been shaped by in-depth knowledge, high expectations, and ethical and societal considerations, the realism of the technology industry could have been the explanation for why students of technology had a low perception of web-based learning.

5.2.29 Pair-wise comparison regarding the Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Discipline

The study revealed that-

- A significant difference was found between students of law and science (0.007); law and veterinary science (0.018); law and computer science (0.000); law and medical (0.000) and, law and teacher education (0.000).
- A significant difference was found between students of arts and science (0.002); arts and computer science (0.000); arts and medical (0.000) and, arts and teacher education (0.000).
- A significant difference was found between students of computer application and computer science (0.033); computer application and medical (0.015) and, computer application and teacher education (0.000).
- A significant difference was found between students of commerce and computer science (0.002), commerce and medical (0.000), and commerce and teacher education (0.000).
- A significant difference was found between students of science and computer science (0.041), science and medical (0.008), and science and teacher education (0.000).
- A significant difference was found between students of veterinary science and teacher education (0.000).

- A significant difference was found between students of computer science and teacher education (0.010) and between students of medical and teacher education (0.006).

5.2.30 Discussion on pair-wise comparison regarding the Perception of Students of Professional and General Degree Colleges in Mizoram about Web-based Learning with reference to their Discipline

Students from various disciplines had different perspectives on web-based learning, which were influenced by the distinctive requirements and features of their respective fields of study. These perceptions were shaped by a number of factors, including the discipline's nature, learning objectives, prior technological experience, pedagogical approaches, the need for community and collaboration, resource availability, and the adaptability and accessibility of web-based learning. Understanding these factors could help students mould educational opportunities to more effectively tackle the needs of students in various fields.

5.2.31 Findings related to the comparison of Uses of Web-based Learning among Teachers of Professional and General Degree colleges in Mizoram

- The usage of web-based learning was higher among teachers of general degree colleges than teachers of professional colleges.

5.2.32 Discussion related to the comparison of Uses of Web-based Learning among Teachers of Professional and General Degree colleges in Mizoram

College teachers in Mizoram may have used web-based learning in different ways depending on the field of education. The subject matter, institutional resources, and teaching styles, as well as the impact and uptake of web-based learning tools, may all have contributed to general degree college teachers' having a higher positive perception regarding the use of web-based learning than by the teachers of the professional college.

5.2.33 Findings related to the comparison of Uses of Web-based Learning among Teachers of Professional and General Degree Colleges in Mizoram with reference to their Gender

- Usage of web-based learning was higher among male teachers than female teachers of professional and general degree colleges.

5.2.34 Discussion related to the comparison of Uses of Web-based Learning among Teachers of Professional and General Degree Colleges in Mizoram with reference to their Gender

It could be concluded that male teachers used web-based learning more often than female teachers among the college teachers of professional colleges and general degree colleges in Mizoram. Computer technology proficiency may have affected how male teachers were perceived as being more technologically skilled, which could have resulted in presumptions about their higher usage of web-based learning. The usage of web-based learning was practised more by male teachers than female teachers which was the reason why they had a higher usage of web-based learning than their counterparts.

5.2.35 Findings related to the comparison of Uses of Web-based Learning among Teachers of Professional and General Degree Colleges in Mizoram with reference to their Discipline

- No significant difference (0.452) was found in the use of web-based learning among teachers of professional colleges and general degree colleges in Mizoram with reference to their discipline.

Therefore, multiple comparisons were not performed as the overall test did not show significant differences across samples.

5.2.36 Findings related to the comparison of Uses of Web-based Learning among Students of Professional and General Degree Colleges in Mizoram

- Usage of web-based learning was higher among the students of professional colleges than the students of general degree colleges.

5.2.37 Discussion related to the comparison of Uses of Web-based Learning among Students of Professional and General Degree Colleges in Mizoram

The practical nature of professional college curricula and the need for specialized skill development naturally lent themselves to the use of web-based learning technologies. Professional college students frequently use academic websites for educational purposes. On the other hand, while general degree college students also regularly visited links related to their education, they placed more emphasis on conventional methods. This was because the nature of their curricula differs and does not require as much assistance from computer technology compared to professional colleges. Therefore, it could be concluded that students in professional colleges used web-based learning more frequently than students in general degree colleges.

5.2.38 Findings related to the comparison of Uses of Web-based Learning among Students of Professional and General Degree Colleges in Mizoram with reference to their Gender

- The usage of web-based learning was higher among male students than female students in the professional and general degree colleges. A similarity was found in the study of Venkatesh et al (2019), stating that male students had significantly higher computer self-efficacy and satisfaction than female students.

5.2.39 Discussion related to the comparison of Uses of Web-based Learning among Students of Professional and General Degree Colleges in Mizoram with reference to their Gender

Male students usually showed a higher level of self-assurance and competency than female students do when it came to the usage of web-based learning among the students of professional colleges and general degree colleges in Mizoram. In professional colleges and general degree colleges in Mizoram, male students tended to demonstrate higher levels of self-assurance and competence when using web-based learning compared to female students.

5.2.40 Findings related to the comparison of uses of web-based learning among students of professional and general degree colleges in Mizoram with reference to their discipline

- Students of computer science used web-based learning most frequently, and computer application students became the least user of web-based learning.

5.2.41 Discussion related to the comparison of Uses of Web-based Learning among Students of Professional and General Degree Colleges in Mizoram with reference to their Discipline

It was found that the students of computer science had the most usage of web-based learning as compared to other disciplines. This might have been because the features of the institution; its curricula, requirements and availability of resources within the computer science encircle brought to light that students of computer science became the most frequent users of web-based learning computer science. At the same time, it was also found that students of computer science became the least users of web-based learning; workload and stress, interdisciplinary may have led to a more nuanced and occasionally critical view of computer science's role and effectiveness which

could have resulted in the least usage of web-based learning among the students of computer application.

5.2.42 Pair-wise comparison on Usage of Web-based Learning among the Students of Professional and General Degree Colleges in Mizoram with reference to their Discipline

The study revealed that-

- A significant difference was found between students of computer application and teacher education (0.017); computer application and veterinary science (0.011) and computer application, and computer science (0.005).
- A significant difference was found between students of arts and teacher education (0.000); arts and veterinary science (0.002), and arts and computer science (0.000).
- A significant difference was found between students of commerce and teacher education (0.022); commerce and veterinary science (0.006), and commerce and computer science (0.001).
- A significant difference was found between medical students and veterinary science students (0.049), and between students of medical and computer science (0.023).
- A significant difference was found between students of - science and teacher education (0.017); science and veterinary science (0.021), and science and computer science (0.006).

5.2.43 Discussion on pair-wise comparison regarding Usage of Web-based Learning among the Students of Professional and General Degree Colleges in Mizoram with reference to their Discipline

The diverse educational needs and approaches to teaching and learning techniques; and discipline-specific requirements contributed to the selection of web-based learning tools. Each field reflected the usage of different web-based learning tools; which showed that there was a significant difference among the students of various disciplines. Understanding these

differences can assist students in providing more tailored and effective online learning experiences across various fields.

5.2.44 Suggestions for improving Web-based Learning Resources among the Professional and the General Degree College Administration

- 1) It is imperative that all higher education institutions, both public and private, possess the minimum essential facilities required for effective web-based learning. Education is related to the concurrent list of the Indian constitution; both central and state governments share a crucial responsibility. They should provide dedicated grants and funding, especially for the establishment and upgrade of necessary infrastructure and resources, those related to computer science standards. Similarly, private institutions, which were run, by any individual or organization must also be mandated to provide adequate web-based learning facilities in their colleges to ensure equitable access and quality education for all students. This proactive mandate will lay the foundational digital infrastructure.
- 2) An effective and hands-on orientation programme is essential for maximizing the utilization of web-based learning resources. The COVID-19 pandemic highlighted that online classes were only a substitute for offline or face-to-face instruction. Without proper knowledge of web-based learning, both teachers and students will struggle to fully leverage their potential independently.
- 3) Proper maintenance of available resources related to web-based learning is required for all institutions. Neglecting maintenance can lead to frequent downtime, outdated information, and a diminished user experience, undermining the investment in these resources.
- 4) The teachers and students have shown an average level of positive perception regarding web-based learning. Therefore, it is necessary that some steps should be taken which can gradually create a more positive attitude towards web-based learning. This can be achieved through demonstrating its practical benefits.

- 5) Both teachers and students in professional and general degree colleges utilized web-based learning to an average extent; indicating a need for specific strategies to boost its widespread adoption. Thus, to increase the use of web-based learning by teachers and students of these institutions, it is required to develop a positive mindset for web-based learning with all the physical support and availability.
- 6) Seminars or workshops should be conducted frequently and regularly for both teachers and students regarding web-based learning.
- 7) The introduction and integration of various academic platforms should be encouraged as frequently as possible to diversify learning experiences and cater to different needs.
- 8) Furthermore, free wi-fi or free internet or intranet connectivity should be provided.

5.3 Conclusion

The research findings unequivocally establish the transformative impact of web-based learning across all levels of education, from early childhood to higher education. The unprecedented events of the pandemic highlighted the widespread adoption of web-based learning, with even pre-primary students engaging in online classes. This mode of learning has become the cornerstone for accessing educational resources, attending classes, exploring career opportunities, and achieving professional success. Its significance extends beyond technical courses to encompass general degree programs such as B.A., B.Com., B.Sc., and others, reshaping the landscape of education in professional and general degree colleges. The far-reaching influence of web-based learning is evident in its provision of flexibility, accessibility, and interactive learning experiences. Students now have access to an array of resources, enabling personalized learning paths and fostering a culture of self-directed education, with teachers playing a pivotal role in guiding their development and success. Previous research has underscored the indispensable nature of web-based learning, particularly during unforeseen disruptions, ensuring continuity in education. Furthermore, its integration has transcended geographical boundaries,

fostering global collaboration and offering diverse perspectives. Despite these advancements, challenges such as the digital divide and ensuring equitable access persist, necessitating ongoing efforts to ensure inclusiveness.

The study's findings shed light on the state of web-based learning in both professional and general degree colleges in Mizoram. It was observed that there are significant challenges in terms of the availability, accessibility, and positive perceptions regarding the usability of web-based learning in these institutions. A notable disparity was noted between the attitudes of teachers and students in professional degree colleges compared to those in general degree colleges, with the former exhibiting more positive perceptions and a better grasp of the potential uses of web-based learning.

Furthermore, an in-depth comparison was made among different disciplines, revealing a significant difference between the teacher education and other disciplines. This disparity indicates that teacher education boasts a more conducive environment and superior resources for web-based learning compared to its counterparts in Mizoram. The study also noted that even in colleges solely dedicated to technological education, such as NIELIT, the perception of web-based learning among teachers was not as positive as their counterparts belonging to teacher education.

In conclusion, the study emphasized the fundamental role of web-based learning in modern education, underscoring its potential to provide limitless opportunities for growth and innovation. It also highlights the need to leverage the continuous evolution of computer technology to create a more dynamic, accessible, and student-centred educational environment across professional and general degree colleges in Mizoram. Furthermore, it underscores the importance of addressing the mindset of teachers in both types of colleges to ensure the effective integration of web-based learning into the teaching and learning process.

5.4 Educational Implications of the Study

1. For policymakers: The policymakers can utilize the findings of this research to form policies regarding e-learning resources or web-based learning resources. Some special provisions can be made for the states of North-East India and other hilly regions as the geographical conditions of the states are challenging.
2. For grant-in-aid agencies: The findings indicate that there were not adequate web-based resources in most of the institutions. So the granting agencies should provide the required grants or funds to equip the higher education institutions with the necessary resources related to web-based learning.
3. For college administration: Based on the findings of the study the college administration should go for proper training, maintenance and a positive environment for the use of web-based learning.
4. For teachers: Teachers had an average level of perception regarding the use of web-based learning and they were using at average level in the teaching-learning process. And at the same time, students were also not very much motivated to use it for learning purposes. So the teacher may be aware of the status of perception of students regarding the use of web-based learning and accordingly can guide them.
5. For students: Students must take an active role in maximizing the benefits of web-based learning by proactively utilizing digital resources to enhance their academic growth.
6. For parents and society: According to the findings, web-based learning resources were widely used by both teachers and students for recreational and entertainment purposes rather than academic purposes. While recreational activities and entertainment are also important, a large section of society is using the internet and other resources for non-learning purposes. Therefore, it is necessary for society members and parents, especially those with undergraduate students in their teenage years, to provide proper guidance and motivation for academic pursuits.
- 7.

5.5 Suggestion for Further Research

In the light of the present study, the researcher encouraged and suggested the following areas for further research:

1. A comparative study can be conducted among Mizoram and some other states of North-East India which have similar geographical conditions to find out the availability and access to web-based learning resources.
2. With the same objectives, studies can be conducted in other states of India.
3. A comparative study can also be taken between Mizoram and other Indian states that have flat land to find out the differences in terms of availability, access, perception and uses of web-based learning.
4. A comparative study of the different categories of colleges such as government, private, aided, and unaided can also be done.
5. A study on teachers' and students' attitudes, interests, and perceptions of social media with regard to academic performance can be conducted.
6. The impact of web-based learning on academic performance can be studied in various colleges in India.
7. A study on the status and uses of web-based resources in various colleges in India can be conducted.

5.6 Limitations of the Study

1. Conducting research with a larger sample was planned by the researcher but due to some constraints such as; the unavailability of teachers on the college campus, and less cooperation from the teachers' side, the data from the ideal sample size could not be collected.
2. Some statements were not properly answered by some participants. Therefore, the researcher removed those questionnaires during tabulation of data and interpretation which reduced the sample size of the students.
3. From the questionnaire distributed to the teachers of Government Kolasib College, only one teacher from BCA returned it. Therefore, the difference in the mean rank through the Kruskal Wallis test could not be made by the

SPSS. Thus, the comparison regarding perception and usage of web-based learning by teachers of BCA discipline has not been done with other disciplines.