

**ICT IN ELEMENTARY TEACHER EDUCATION PROGRAMMES:
CASE STUDIES OF DIETs IN AIZAWL AND LUNGLEI**

**Dissertation Submitted in Partial Fulfillment for Degree of Master of
Philosophy in Education**

**Submitted by
Gloria Lalchhanhimi**

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**Under the supervision of
Prof. R.P. Vadhera**



**DEPARTMENT OF EDUCATION
SCHOOL OF EDUCATION AND HUMANITIES
MIZORAM UNIVERSITY**

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DECLARATION

I, Ms.Gloria Lalchhanhimi, hereby declare that the subject matter of dissertation entitled “ICT in Elementary Teacher Education Programmes: Case Studies of DIETs in Aizawl and Lunglei” is a record of work done by me; that the content of this dissertation did not form basis of the award of any previous degree to me, or to the best of my knowledge, to anybody else; and that the dissertation has not been submitted by me for any research degree in any other University/Institution.

This is being submitted to the Mizoram University, Aizawl for the award of Master of Philosophy in Education

Mizoram University
Aizawl: Mizoram
Date: 21st July 2016

(GLORIA LALCHHANHIMI)
Candidate

(PROF R.P.VADHERA)
Head
Department of Education

(PROF R.P.VADHERA)
Supervisor



AIZAWL: MIZORAM – 796004 Post Box No- 190

PROF .R.P. VADHERA
Department of Education

Phone No. 9436354144

Dated:21stJuly 2016

Certificate

This is to certify that the work incorporated in this Dissertation entitled **ICT in Elementary Teacher Education Programmes: Case Studies of DIETs in Aizawl and Lunglei** is a bonafide research work carried out by **Gloria Lalchhanhimi** under my supervision for her M.Phil Degree and the same has not been submitted previously for any degree.

(PROF, R.P. VADHERA)

Supervisor

Professor& Head

Department of Education

Mizoram University, Aizawl

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Dated Aizawl
The 21st July 2016

(GLORIA LALCHHANHIMI)
Department of Education
Mizoram University

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Chapter 1

Introduction

Chapter 1

Introduction

1.0 Introduction

The need for a man to be well informed is never ending. It is one of the many aspects which separate him from the other creation under the sun. He is always in search for knowledge; he needs to know what is surrounding him, what are their natures? how useful it is for him? how harmful can it be?, the questions go on and may never end. Man is an innovative one among all the different species in the planet. First, he invented the circle, or the 'wheel' and the inventions continue. And, here we are, sitting in our comfortable chairs in a comfortable house, our air conditioned, chatting face to face with people who are on the other side of the world, we travel around the world in a day without a sweat, there is not a single thing on this earth that cannot be looked up on the internet, all these are only because of technology.

At the turn of the century, technology plays a very important role in the daily routine of the world; in fact, the whole world depends on it. Spending a single day without technology would be a very challenging thing to do, even impossible for people in the city. There are thousands of software applications, which do all the person's job to accomplish a task.

The quality of education constantly requires improvement. Every nation, every education system gives effort for a good quality education. The contributing factor for an effective teaching learning process is communication. The traditional method of communication in the classroom, i.e. the lecture method where the teachers do most of the talking, may sometimes be effective for a particular situation, but cannot always be; they however require more time and a very good communication skill. Great inventions are made during this past decade; technologies can substituting a wide range of things, things that require a great deal of man power, time and money.

Technology needs to be carried inside the educational field. It is not only in the developed countries that technology has its impact. Even in the far most corner state

of India like Mizoram, one can see smart-phones in the hands of small vegetable sellers, leading to a great pressure for teaching young people about Information and Communication Technology, how to use it in an effective manner and bring it in the educational context.

As the access to information continues to grow rapidly, schools cannot be contented with the limited knowledge to be transmitted in a fixed period of time and in a fixed set of textbooks. Schools have to become compatible to the ever expanding knowledge of the world and also be equipped with the technology to deal with this knowledge.

1.1 Information and Communication Technology

ICT is an acronym that stands for- information, communication, and technology. Information and Communication Technology (ICT) is often used as an extended synonym for information technology (IT), but is a more specific term that stresses the role of unified and the integration of telecommunications (telephone lines and wireless signals), computers as well as necessary enterprise software, middleware, storage and audio visual systems, which enable users to access, store, transmit and manipulate information. ICT is anything which allows us to get information, to communicate with each other, or to have an effect on the environment using electronic or digital equipment". ICTs as defined by United Nations Development Programme (UNDP), are basically information-handling tools- a varied set of goods, applications and services that are used to produce, store, process, distribute and exchange information. They include the 'old' ICTs of radio, television and telephone, and the 'new' ICTs of computers, satellite and wireless technology and the Internet. These different tools are now able to work together, and combine to form our 'networked world' – a massive infrastructure of interconnected telephone services, standardized computing hardware, the internet, radio and television, which reaches into every corner of the globe. ICT is critical particularly in the context of global development goals, the increasing demand of education for all, and the inability of existing educational systems to meet such a demand without support from the ICTs.

1.2 ICT in Education

As the access to information continues to grow exponentially, schools cannot remain mere venues for the transmission of a prescribed set of information from teacher to

student over a fixed period of time. Rather, schools must promote "learning to learn," i.e. the acquisition of knowledge and skills that make possible continuous learning over the life time. So ICT literacy or Digital Literacy is a modern technology in the field of education. The use of ICT in acquiring digital literacy has become essential element in educational process and has immense effects. The Government of India for the first time set up a national task force on Information Technology and Software development in May 1998 to universalize computer literacy. The National Curriculum Framework - 2005 for school education emphasizes a paradigm shift in respect of the entire process of education. In the Eleventh Five Year Plan (2007-12) and the Twelfth Five Year Plan (2012-2017), importance of ICT in education has been emphasized looking to the potentialities of ICT. As it is written in the Twelfth Five Year Plan, the National Policy of ICT in School Education envisions and provides for the development of a holistic framework of ICT support in the school system. Mission Mode Project (MMP) on School Education is now under the National e-Governance Plan (NeGP), these efforts however are formed for the Secondary Schools. The present Prime Minister, Narendra Modi have also launched the Digital India, a flagship programme of the Government of India with a vision to transform India into a digital empowered society and knowledge economy. But it is not feasible unless the people are trained. Digital India cannot happen in a day, and training cannot be just given to the population, it is a long process. The only way is to start teaching the students from all round the country.

The traditional method of teaching in which the students passively sits in the class, listening to the teacher's lecture is not adequate in today's classroom teaching. IT driven education is changing the methods of content generation, content storage, content packaging and content delivery and hence offers a new paradigm of education. For the development of humanity, education is the key and in order to educate the world, technology is required. ICT help the students to be more acquainted on what they are learning and the teachers to know how to teach and inspire more effectively. Students and teacher should have sufficient access to digital technologies and internet in their classrooms, schools, and in teacher education institutions.

With the use of ICT in the teaching learning process, student can see what they are leaning from the digital screen. For example, when the effect of over population is

taught in the class, pictures and videos documentary of overpopulation can be shown to the children. This gives a complete picture of what is happening to the socio-economy, the environment, etc. and thus gives a long lasting image in the minds of the child. Great emphasis has been given by the UNESCO that ICT should go hand in hand with the education process.

The importance of ICT is now occupying a significant places within the school curriculum. It has become a subject in its own right as a separate discipline. The main objective is to develop skills, knowledge and understands ICT and prepares pupils to use technologies in their everyday lives. The role of ICT within the curriculum is not only to enhance the learning experiences of people but also to help them develop the skills essential to participate effectively in the world affairs. It creates a place for the students to work in groups, develop team spirit, cohesion, and social values.

The use of ICT in not just to depict information but it is to integrate in the lesson, interact, share and learn. It is a means to make teaching learning more productive. Modern constructivist educational theory emphasizes critical thinking, problem solving, “authentic” learning experiences, social negotiation of knowledge, and collaboration. Students learn how to learn, not just what to learn. Simply adding technology tool to traditional teaching approach does not produce more effective instruction and make the process harder and more complex without providing much benefit. In order for technology to be used effectively in the classroom, teachers have to make sure that they are using it as part of an approach that involves the students in the activity (Sabzian, Lahijan and Sodouri 2013).

1.3 Importance of ICT in Elementary Education

Primary (Class I–V) and upper primary (Class VI–VIII) comprises the Elementary Education, it is the foundation of the education pyramid. Unless this foundation is strengthened, it will not be feasible to achieve the goal of universal access to quality education for all. In order to learn, a child needs to want to learn it, so that his interests are maintained throughout the education process Traditional classroom teaching methods do not always provide children with a fun learning environment. There is a need for elementary school education to focus on learning through playing and exploration in order to improve a child’s physical, emotional, sensory, cognitive, reflective, communication and social developments. Educational Technology includes

all the approaches of technology that are utilized to enhance learning. Today's technology helps educators engage students with many fun learning approaches, because it attracts them. Introducing technology into the childhood education gave responsibility to the educators and parents to take proper care to avail many positive benefits of it.

Today's students love technology so it is certain that they will be interested in learning if they can use the tools they love. Mobile devices and computers provide students with a fun learning environment. Different students have their own different learning styles, and integrating technology into the classroom is a great way to reach diversity in the children, and the settings in technology helps them learn in the way they are comfortable with. Many games, storytelling applications, online tools, etc., are introduced into the elementary classroom of developed countries, to engage students more effectively in their learning. With the advanced technological devices, students can learn from anywhere. Technologies can help teachers and parents to provide students with the personalized learning environment, making easy for teachers to engage students with lesson concepts through animations, multimedia presentations, etc., rather than depending fully on traditional technology-textbooks and blackboard. Just like playing video games at home, trying to beat high scores in the game and trying to beat high scores in mathematics use the same psychology. (Corr 2006)

Haugland (1999) argues that computers and ICT can be used in the developmentally appropriate ways with very young children. It is recommended that computers should be introduced to young children when they are about three years of age. In any learning environment for children, ICT based activities should not replace the use of concrete materials. Children still should explore books, measure water and sand, draw with pencils and crayons, and write on paper, together with all the other traditional experiences of kindergarten and primary school. Computer based activities can be used to complement and enrich the learning experiences of young children.

A child carrying heavy backpacks, text books, and exercise book is a huge burden and inessential. Mobile technology allows for greater collaboration between students promoting strong foundations in group work. Students who use technology are motivated to improve performance. Teachers have a responsibility to introduce,

encourage, and help students to master technology, as well as subjects, as it applies to school and the future. Technology will be used in every aspect of the professional lives of current students. So after graduation, whether the next step is college or career, technology will be used daily.

Many online tools that connect teachers, students and parents, have been created to use into classroom to help them collaborate from anywhere and at any time. There are tools such as an educational social networking platform, which enable teachers to add their students, parents and other colleagues into a circle, where they can cooperate and interact. It saves time by providing them with many advantages such as, setting homework, sending documents, creating calendars and students' assessments. These tools should also be use in our local schools as well. Technology develops students' social skills, research skills and communication skills and teachers must possess the skills of integrating these technologies in their teaching and make the students and parent aware of digital citizenship. In this digital era, classrooms should enable game-based learning, project-based learning, inquiry-based learning, visual learning, auditory learning, kinaesthetic learning, etc. Our nation has become increasingly more dependent on technology; making it even more necessary that to become a successful citizen, students must be technologically well informed. The traditional passive learning mode has to be broken. If mobile technology is readily available in the classroom, students will be able to access the most up-to-date information quicker and easier than ever before, creating the students become more responsible. Technology helps students take more control over their own learning. It will help them learn how to make their own decisions and actually think for themselves. Most household nowadays has been equipped with technological device namely, desktop computer, laptop computer, smart phone, tablet, etc., and most students love using them. From the ease of communicating with their teachers via e-mail, to quickly accessing an overabundance of information online about a particular topic they have learned about in class, technology is needed in today's classroom. If used correctly, technology will help prepare students for their future careers and thus elementary schools need to implement technology in the classroom.

1.4 Teacher Education

According to the National Council for Teacher Education, Teacher Education is, “a programme of educational, research and training of persons to teach from pre-primary to higher education level.” Teacher education is a programme with the intensions to develop teacher proficiency and competence that would enable and empower the teacher to meet the requirements of the profession and face the challenges therein. In the beginning of the 20th century, the programme of teacher preparation was called teacher training. Teachers were prepared as mechanics or technicians. The perspective of teacher training was very narrow and the scope was limited. But now the scope has change to teacher education, encompasses teaching skills, sound pedagogical theory and professional skills.

As the Twelfth Five Year Plan has mentioned in the Social Section, Teachers need to be adequately prepared to deal with the realities of their schools. In many areas, particularly rural areas, there are multi-age, multi-grade and multi-ability classrooms. This would require special competencies amongst teachers to not only have the necessary subject knowledge, but a repertoire of pedagogical approaches and techniques that help them to teach effectively to improve learning outcomes for a diverse group of children. For improving teacher competence, qualities of teacher training have to be considerably enhanced. Motivating teachers is more difficult. The issue of teachers is critical and needs focus. It also further stated that, Linkages of teacher education institutes with each other, for example, of DIETs with CTEs and IASEs, and with the field, for example, the school system and Non-government Organizations operating in the sector need to be strengthened across the country such that academics and practitioners can work together towards the improvement of teacher education and school education more broadly. There should be effective use of technology as a tool for teacher education where special modules could be imparted to candidates across different geographical locations. These modules should integrate video lectures of professionals and highly reputed facilitators with careful selection of content. This can be combined with practical ‘hands on’ training in school environments in identified schools.

1.5 Importance of Pre-Service Teacher Education

Professional development for teacher is more than training or classes as it functions as an agent for change in their classroom practices. Skills in teaching are developed through personal reflection, interactions with fellow student-teachers and mentoring which gives confidence by engaging with the activities and reaffirming their experience. These gives a positive impact on the teachers' pedagogical content knowledge, their lack of interest to acquire the resources needed to create appropriate learning environments and their lack of confidence. For the improvement in the quality of education, professional development of teachers is the central importance.

Teacher education is essential for every teacher; teachers who have gone through teacher education programme can do much more than untrained teachers. Teaching is not confined to tell or impart knowledge of subject-matter to others, the perspective of teaching is wider. Having the right skills and attitude such as the responsibility and duties of a teacher can be developed only through a programme of teacher education.

For achieving the goals of a nation, the academic and professional standards of teachers occupy a crucial component. Preparation of teachers focuses to make a positive influence on the quality of curriculum transaction in classrooms and thereby pupil learning and the larger social transaction.

Educating children does not solely depend on the necessary knowledge of a teacher to carry out their work. Teachers need to be equipped with the skills necessary for reaching the goal of the all round development of the child. The steps necessary to gather additional information that will allow teachers to make more grounded judgments about what is going on and what strategies may be helpful needed to be acknowledged. More importantly, teachers need to keep in mind what is best for the student at the centre of their decision making. They have to acquire adequate knowledge, skills, interests and attitudes towards the teaching profession. The teacher's work has become more complicated and technical, they can be made proficient with well planned, imaginative pre-service training programmes.

1.6 Importance of ICT in Pre-Service Teacher Education

Teachers are the key to the successful integration of ICT into education. They manage the processes of teaching and learning. Without the active, enthusiastic and skilled participation of teachers, innovations to enrich education with the advantages offered by technology are doomed to fail. The full participation of teachers in adopting new technologies to enhance education requires a commitment to ongoing professional development of teachers.

The quality of education depends on the quality of the teachers. Teaching can be considered as one of the most challenging professions where knowledge is expanding rapidly and much of it is available to students as well as teachers at the same time. Today's technologies need to be used in today's teaching and learning. ICT literacy involves a working knowledge of current basic technology and understanding of how to use it for education. The use of ICT in and for Teacher Education is now seen world wide as both a necessity and an opportunity. In India as well as abroad, efforts have been made to integrate ICT in teacher training programmes. National Council for Teacher Education (NCTE) has put great emphasis on its use, ICT orientation camps for training the teacher; one of which is 'Intel Teach Program', a worldwide effort to help In-service and Pre-service teachers to integrate technology in the classroom. ICT Programs help teachers to promote higher order thinking among the students and create student-centric learning environments. Teacher's attitude towards ICT programs and digital literacy are major factors related to both the initial acceptance of ICT as well as future behavior regarding its use (Chaudhary 2012). Training, support and time to experiment is needed and continuously retrain themselves and acquire new knowledge and skills.

In the present scenario, although the government is providing computers and projectors in the school, they are found lying around in the school with their wrappers still covering them. There can be several reasons; most possibly, the teachers are not trained to be able to make use of technology, which is a complete misuse of money. For the future teacher of the country who will be handling the future of the nation and of humanity, it is immensely important that that ICT should be included in the syllabus of teacher education.

From the recent studies conducted, it is evident that information and communications technologies (ICT) can have a better impact in the teaching learning process. Through researches, it can also be seen that for the success of ICT in education, the teachers and their skill level in integrating ICT into the teaching process played the most important roles so that learner-centered and interactive education can be accomplished (Sabzien et. al. 2013, Anderson & Galstaun 2012, Goktas et. al. 2009, and Markauskite 2007). ICT forms criteria for grading of teacher training institutes. Thus, it can be said that it is imperative to make teacher education well acquainted with ICT related innovations in teacher education.

Teachers play a central importance in the process of teaching learning, for that the knowledge of ICT and skills to use ICT in teaching-learning has gained enormous importance for today's teachers. To make learning more meaningful (Khirwadkar 2008), teachers need to know how to successfully integrate ICT into his/her subject areas. When the teachers are equipped with the knowledge of ICT then the effectiveness of information technology can only be sown. (UNESCO, 2002)

Today, the teacher's preparation is not merely limited to reading books, for conceptual clearance they have to refer to internet technology and thus share the same with their students. Computer based effective teaching offers powerful, interesting and new way of providing knowledge to students. So, for effective teaching with new ICTs every teacher needs to know about technology. Teachers need to know how to operate and integrate the tools effectively. Effective teachers maximize the potential of the technology to develop students' understanding and stimulate their interest to improve subject proficiency. Technology can be used strategically to provide better access for learning and concept clearance, supporting traditional forms of learning as well as to transform learning. A Power Point presentation, for example, can enhance a traditional lecture, but it does not necessarily transform the learning experience. On the other hand, using multimedia cases to teach topics that have previously been addressed through lectures may well be an example of a learning experience transformed by technology. For this, educators should be aware and informed about the tools. Use of internet tools can be fun, attractive and quite exciting. Using technology, educators can make the boring lectures far interesting by delivering dynamic presentations. Through advocating videos, a student's interest can be enhanced in a particular topic. There are abundant lectures on 'teachertube', 'edutube'

etc. that could be reviewed in reference. Students use internet tools on a regular basis and using internet technology by a teacher for educating students in a classroom means that teachers will be talking to them in their language that leads to broad understanding. So learning about these tools is not a bad idea. Technology opens vast opportunities that could never have been possible previously.

Using technology, the classroom can be taken anywhere. With all the knowledge and resources contained and deliverable on demand in a mobile device, student-teachers can learn at home or in any place. Mobile technology allows for greater collaboration between the student-teachers promoting strong foundations in group work. Assessing student-teachers' performance can be done instantly with technology. It tracks and reports the student-teacher's progress instantly. This feedback provides instant motivation to improve performance. Similarly students who use technology are motivated to improve performance.

Updating textbooks can cost lots of money and do significant difference to the nation's budget. On the other hand, updating software applications and educational content is not as expensive or cumbersome. With the help of technology course curriculum can reflect real world data. In some applications students can be exposed to real-time information. The student-teachers, educators and classrooms or even the whole institution can be connected to anyone in the world instantly. The chance to understand international or different cultural perspectives on the same topic is incredible.

Teachers have the responsibility to introduce, encourage, and help students to master technology, as well as subjects, as it applies to school and the future. Technology will be used in every aspect of the professional lives of current students. Why not use it daily in teacher education programme, since, it is the present pre-service teacher who will be teaching the future of the nation.

Professional development to incorporate ICTs into teaching and learning is an ongoing process and should not be thought of as one 'injection' of training. Teacher educators need to update their knowledge and skills as the school curriculum and technologies change. Individuals develop in stages and mature over time. Teaching pre-service students about the basic computer literacy- the traditional operating system, word processor, spreadsheet, database, and telecommunications topics is not

enough. As with any profession, there is a level of literacy beyond general computer literacy. Technology should be infused into the entire teacher education programme. Throughout the student-teachers' training experience, they should learn about and with technology and how to incorporate it into their own teaching. Pre-service student-teachers should learn about a wide range of educational technologies across their professional preparation, from introductory and foundations courses to student teaching and professional development experiences. The new platform Digital India will fail if it ignores the teachers, the most critical element in the development of the nation. Connecting the student with the best teachers is not enough, but also providing an environment to create better teachers is imperative (Kupathil 2015)

The classroom of 10 years ago looks very different from the classroom today. Education of the future will be delivered with current information delivered through traditional teaching methods and fantastic technological tools. No matter how technologically advanced the education system turned out, teachers will still retain control over learning, and in doing so ICT should be incorporated in the teacher education programme.

1.7 Elementary Teacher Education in Mizoram

The training of elementary school teachers in Mizoram is taken care by DIETs, which offer 2 years diploma course consisting of four semesters. Further, it is pertinent to mention that out of 8 DIETs in Mizoram, only 2 DIETs namely, DIET Aizawl and DIET Lunglei are eligible to offer pre service training programmes, whereas the remaining 6 DIETs viz. DIET Champhai, DIET Serchhip, DIET Kolasib, DIET Siaha, DIET Mamit, and DIET Lawngtlai offer only in service training programmes to elementary school teachers in their respective districts as their up-gradation to a fully-fledged DIETs from mini-DIETs has not yet been recognized by NCTE, the regulatory body for teacher education.

- **DIET Aizawl**

DIET Aizawl is originally established as Junior Basic Training Centre for untrained Primary school teachers in September 1st 1953. It was upgraded to District Institute of Education and Training (DIET) in December 1988. Carrying out innovations for improving the functioning of elementary education and conducting in-service and pre-service training programmes to elementary school teachers as their main objectives. It

is situated at Chaltlang in the northern city of Aizawl, each year DIET Aizawl enrolls 50 pre-service student-teachers. Practicing school is also set up in the campus under the authority of the headmaster of DIET.

- **DIET Lunglei**

The DIET in Lunglei was established in 1974 and is located at Lunglei, Serkawn Melte. The name of the institution at the time of establishment was Under Graduate Teacher Training Institute (UGTTI) and is now upgraded as DIET. DIET Lunglei provide both Pre-Service and In-Service programmes. Each year DIET Lunglei enrolls 50 pre-service student-teachers.

1.8 Rationale and Significance of the Study

The world is undergoing a transformation due to the result of a continuous development in the field of information and communication technology. Technology occupies the centre stage of all development; creating a strong impact on society. It also has a great impact on the educational system as well. New gadgets of technologies such as laptops, notebooks, tablets, smart phones, smart TV, smart boards, etc. are coming up at an accelerating pace. The implementation of these new educational technologies in the class will help to shift focus from teacher-centered education to student-centered education. This explosion in the field of knowledge and information technology has virtually altered the characteristics of the learning environment, paving the way for new learning environments and the emerging new learners.

Technology is widely used in homes and workplaces, so it is important for children to grow up with the knowledge and skills to efficiently use it in their studies and in the development of their career. Integrating ICT at primary school level is a great foundation to grow from, since technology is getting more advanced day by day and there is a crucial need of teachers with the right skills to use it.

By taking this background into consideration, it is the utmost need of the society for conducting a research in the field of use of computers and computer aided technology or information and communication technology in the field of teaching learning. Keeping the importance of ICT in elementary teacher education in mind, the following research questions were raised:

Research Questions

1. What are the ICT components in elementary teacher education programmes in the DIETs in Aizawl and Lunglei?
2. What is the status of ICT infrastructure in DIET Aizawl and DIET Lunglei?
3. What is the level of use of the available ICT infrastructure?
4. Is there a difference in the availability of ICT infrastructure in the two DIETs?
5. What is the level of preparedness of the student-teachers in the use of ICT in teaching and learning?
6. What is the opinion of the student-teachers on the use of ICT in the teacher education programmes?
7. Is there a difference in the opinion of the student-teachers on the use of ICT in teacher education programmes in relation to the DIET they belong?
8. What is needed for the improvement and better use of ICT in the elementary teacher education?

1.9 Statement of the Problem

From recent studies conducted, it is evident that ICT or technology alone cannot function or does not make any difference in education, teachers who are bestowed with an utmost responsibility need to be trained of the present basic knowledge of technology. They need to be fully equipped with the skills to operate the hardware and the software applications. Most importantly, it is the availability of such machinery in schools and institutions that will make the difference. Institutions are not equipped with technological devices. There is a need to have skilled teachers in technology to teach students in Elementary schools. The teaching-learning process in education needs to move forward; it cannot simply keep on with the traditional teaching process, i.e. the lecture method where children sits passively and listen to whatever the teacher is taking about. Children need a lot more of stimuli to motivate them and be more acquainted with the lesson they are learning. For this the teacher need to make use of computer and any king of technology in the classroom or in any educational situations. In order to achieve the aim of education, teachers need to be trained so that they may be equipped with the information and skills to execute and employ technology in a perfect manner. In the state of Mizoram, the use of technology in the society is also growing in a fast pace. In order to have an effective education system in the scope of pedagogy, teachers need to be able to make use of

the hardware and the software available in the schools. Thus the proposed study is to have a deeper knowledge on how the teachers in Elementary Schools are being trained and how well are the teacher education institutions physically equipped to carry out the task. The problem of the proposed study has been stated as: “*ICT in Elementary Teacher Education Programmes: Case Studies of DIETs in Aizawl and Lunglei*”

1.10 Operational definition of the term used

To avoid any misconceptions, the concepts used in the title of this study have been defined as under:

ICT: The acronym ICT in this study stands for diverse set of technological tools and resources that can be used to create, store, manage and disseminate information.

“anything which allows us to get information, to communicate with each other, or to have an effect on the environment using electronic or digital equipment”.

Elementary Teacher Education: In the present the term Elementary Teacher Education refers to the Diploma in Elementary Education offered by the DIETs for pre-service training of elementary school teachers.

DIET: District Institute of Educational Training is an institution that conducts pre-service as well as in-service training of elementary school teachers.

1.11 Objective of the Study

a) Specific objectives:

1. To study the ICT components in elementary teacher education programmes in the DIETs in Aizawl and Lunglei in the light of the National Curriculum Framework for Teacher Education.
2. To examine the ICT infrastructure and level of its use in the two DIETs.
3. To study the opinion of student-teachers on the use of ICT in teacher education programmes.
4. To study the level of preparedness of student-teachers in the use of ICT in teaching and learning.
5. To suggest measures for integration of ICT in pre-service and in-service teacher education programmes.

b) Concomitant Objectives:

- i) To develop a student-teachers Opinonnairs towards ICT for assessing the student teachers attitude towards ICT.
- ii) To develop questionnaire for assessing the student teachers level of preparedness.
- iii) To develop a checklist to find out the components of the institutions.

1.12 Hypotheses

The study was under taken to test and verify the following 2 hypotheses with regard to the opinion and preparedness of student-teachers in relation to the use of ICT.

Ho.1: The opinion of the student-teachers on ICT is independent from the DIET they study in.

Ho. 2: There is no significant difference between the student-teachers of DIETs in Aizawl and Lunglei in relation their level of preparedness to use ICT in teaching learning processes.

1.13 Organization of the Report

The report of the present study has been divided into four chapters to give a clear picture of the present study.

Chapter 1: Introduction- The foremost chapter is the introduction of the study, beginning with the evolution of knowledge and information and the concept of ICT. The first chapter also deals with the rationale of the present study, statement of the problems, objectives of the study, operational definition and hypotheses.

Chapter 2: Review of Related Literature- The second chapter gives a study of the related studies which have been conducted before, from both national and international studies.

Chapter 3: Methodology and Procedure- The third chapter gives a detail account of the methodologies and procedures undertaken for the present study. The tools for data collection, the administration and scoring of data and the statistical technique adopted for analyzing the data. All of these are discussed in this chapter.

Chapter 4: Analysis and Interpretation of Data- The forth chapter deals with the analysis and interpretation of the collected data. The ICT component in the two DIETs, the infrastructure of the two DIETs, the opinion of the student-teachers of the

DIETs towards ICT, and the level of preparedness of the student-teachers in using ICT.

Chapter 5: Main Finding, Discussion, Recommendations, Suggestions for Further Research and Conclusion- gives detailed description of the result obtained in the present study, recommendations, suggestions and conclusion.

Chapter 2

Review of Related Research

Chapter-2

Review of Related Research

2.0 Introduction

One of the most important steps in the planning of any research is a careful study of the research journals, theses, dissertations, books and other sources of information related to the problem to be investigated. After getting familiar with studies that are related to the planned investigation, the researcher is aware of the methodology and the tools used in previous studies, and thus the investigator is able to plan his or her research without wasting his or her time, and guard against possible irrelevant research & minimizes the chances of duplication. This chapter has been organized and presented under the following three sections.

- 2.1 Research on ICT: An International Scenario
- 2.2 Research on ICT: A National Scenario
- 2.3 Variable-wise Analysis of the National and International Studies Reviewed
- 2.4 Justification of the Present Study in Relation to the Studies Reviewed

2.1 Research on ICT: An International Scenario

Glenn & Carrier (1986), in their study, “Teacher Education and Computer Training: An Assessment” tried to find out the status of teacher education’s responses to the challenges of training teachers to use computer effectively in the classroom and what actions should be taken to continue to meet the challenges of preparing tomorrow’s teachers for a technology age. They come to the conclusion that introductory technology training efforts should remain the same as it is but at the same time technology training programs must be developed in moving the teachers from the awareness level to an instructional skill level. Technology training is needed in the

teacher education programme to help teachers with their teaching process as well as make them comfortable and content with the technology itself.

In 1998 **UNESCO** describes the Teacher and Teaching in a Changing World in its World Education Report, the report describes the radical implications of the new information and communication technologies have for conventional teaching and learning. As the experience of the application of the new technologies grows, teachers are likely to exert a stronger influence than they have had up to now on the development of the technologies into effective teaching and learning tools

Jung (2005) analysed new possibilities and challenges which ICT has brought to teacher training and professional development from four approaches which was organized into four-cell matrix-Learning How to Use ICT, via ICT, Core Technology and a Complementary Technology. The study shows that many cases adopted ICT into their training process not just as content of the training but rather as an integrated training environment and thus allow teachers to experience ICT-based pedagogies. Use of ICT in teacher training connects teachers to a large international teaching community.

Kiridis and Tsakiridou (2006) in their study “Teachers Facing ICT: The Case of Greece” aimed to clarify the potential of the integration of the new technologies in public primary education. The result shows that in spite of the fact that ICT is thought as a very useful tool in teaching learning by most of the teachers, but they are still not sure whether advanced ICT should be utilized in the public primary school.

Wozney et. al. (2006), in their study “Implementing Computer Technologies: Teachers’ Perceptions and Practices” in Montreal, Canada; investigated the personal and setting characteristics, teacher attitude, and current computer technology practices. The study found that the expectancy of success and perceived value were the most important issues in differentiating levels of computer use among teachers; personal use of computers outside of teaching activities was the most significant predictor of teacher use of technology in the classroom; and teachers’ use of computer technologies was predominantly for “informative”.

Beastall (2006) examines the effect of the development of ICT on teachers and pupils, and questions the government’s motivation for change. The introduction of ICT has

not been followed by professional development for teaching staff in the pedagogy of ICT across the curriculum and may have merely served to reinforce the generational digital divide. The government may have alienated the teachers in their process of enchanting the pupils. It was suggested that the Department for Education and Skills should lay more emphasis on developing strategies and providing funding for solutions to gaps in the professional development of teachers in their pedagogical understanding of ICT across the curriculum.

Boon et.al. (2007) examined the teachers' attitudes and perception towards the use of inspiration 6 software, a technology-based instruction as an effective instructional strategy in inclusive social studies classes in three high schools. It was found that teachers were positive towards the use of software and had potential to improve student learning, increase student engagement, provide important study skills, and improve student motivation through the novelty of using computers in social studies instruction.

Markauskite (2007) examined the nature of trainee teachers' ICT literacy through exploratory and confirmatory factor analysis. Two elements of ICT related general cognitive capabilities and three elements of technical capabilities were identified, respectively: (a) problem solving, (b) communication and metacognition, (c) basic ICT capabilities, (d) analysis and production with ICT, (e) information and Internet-related capabilities. It was found that general cognitive and technical capabilities are two separate areas of ICT literacy; however basic ICT capabilities are an important component of both areas.

Gill & Dalgarno (2008) explored first year teacher education student preparedness to use ICTs in the classroom. Despite the prevailing view that this generation of University students are 'Digital Natives', there is a number of barriers to their preparedness to use ICT in the classroom. The pre-service teachers' personal preparedness including attitude, motivation and confidence, along with various social factors are important.

Grove (2008) in her "Student Teacher ICT Use: Field Experience, Placements and Mentor Teacher Influences" discovered that teacher preparation programs and their school district partners that provide field experience settings and mentor teachers needed great collaboration with the purpose to identify factors for the best placements

for student teachers in order that they will learn to teach effectively in digital classroom.

Goktas et. al. (2009) in their study on ‘The main barriers and possible enablers of ICTs integration into pre-service teacher education programmes in Turkey’, found that majority of the stakeholders believed that lack of in-service training, lack of appropriate software and materials, and lack of hardware were the main barriers for integrating ICTs in pre-service teacher education programmes. Having technology plans was the strategy most strongly agreed upon in ICT in the teacher education programme.

Brun & Hinostroza (2011) tried to contribute for developing more innovative and better quality in pedagogical practices in the educational level in their study “Learning to become a teacher in the 21st century: ICT integration in initial Teacher Education in Chile”. The existence of institutional policies; the overall infrastructure, the availability and access to ICT resources, and the availability and quality of technical and pedagogical support have reached adequate levels. But although teachers show high self-reported levels of comfort and confidence for using ICT, they lack competencies in the field of ICT integration and confirming the importance to teach future teachers how to integrate ICT in teaching and learning.

Martinovic & Zhang (2012) examined pre-service teachers’ expectations of integrating ICT and their attitude towards the learning and integration of ICT into their teaching, their perceptions of the availability and use of ICT in the Teacher Education Program (TEP) and their placement schools. The researchers collected data through online survey and focus group meetings. They identified some challenges which may be present in teacher education and education system all over the world, such as inadequate access to ICT both in TEPs and in schools, and lack of modeling by tertiary instructors.

Anderson et. al. (2012) studied on developing Information and Communication Technologies (ICT) competency in pre-service teacher education Units of Study. The study involved students in Science Education and ICT in Education Units of Study. Data were collected from annotated video feedback, reflective journals and pre- and post-test. Initial findings showed that the design process deepened the pre-service teachers’ understanding of the affordance of internet technology and that pre-service

teachers increased their technological, pedagogical and content knowledge at the end of the semester.

Sahin (2012) investigated pre-service teachers' perspectives of the diffusion of information and communication technologies (ICT) in elementary education and the effect of case-based discussions (CBDs). The cases were mainly text-based and presented stories of elementary teachers' in-class usage of ICTs. A quasi-experimental pre-test post-test design was executed to test the effect of pre-service teachers' perspectives on ICTs diffusion in elementary teaching. The research results reveal that the pre-service teachers' perceptions about innovativeness and relative advantage indicated that they had pre-established perspectives, mainly positive, about the diffusion of ICTs in elementary teaching; and CBDs positively affected their perceptions such that their computer-related persuasions and decisions positively increased.

Mndzebele (2013), in her study in Swaziland on Teachers Readiness in using ICT in the classroom in the case of a developing country, reported that the Ministry of education has to build an education and training system that will support the teaching of ICT as a subject and ICT integration in teaching and learning. A quantitative research design was used through a questionnaire to collect data from a sample of schools. Interview was also used as a collection of data in all teacher education institutions in the country.

European Commission (2013) reported that from a survey of ICT in Education in Europe, most teachers still use ICT in preparing their teaching and only few teachers use it during lesson for enhancing their teaching.

Mitchell & Laski (2013) in their survey on Integration of technology in elementary pre-service teacher education tried to find out the effective use of educational technology by instructors of elementary mathematics method and the kinds and numbers of educational technology they included in their course. The findings indicated that while they viewed educational technology research as important to their field, they neither access such research nor use technology in their course to any degree.

Konstantinos et. al. (2013) investigated the views of ICT teachers in relation to the aims of Ministry of Education in which the “New School”, an innovative new curriculum applied experimentally in Greek schools, introduces the full and effective use of ICT in all aspects of school reality. And the obstacle teachers encounter in their teaching process. The investigation result uncovered that on one hand there is a reasonable confusion among teachers with regard to their role and on the other hand, there are several external and internal barriers to effective teaching.

Chemwei et. al. (2014) were inspired with the fact that while different countries in the world are developing with taking in technology in their teacher education system, Kenya is lacking behind from other countries, teachers educators are not integrating technology in their instructions. Their study “Assessment of Information and Communication Technology (ICT) Integration in Instruction in Teacher Education Institutions in Kenya” aimed to determine the level of integration of ICT by the teacher educator in the training college. The result was that the level of ICT integration in the primary teacher training programmes was in its smallest possible amount. It was also found that the younger teacher-educators had higher levels of ICT integration in their teaching process than the older teacher-educators. Teacher-educators considered ICT as a separate subject rather than a medium of instruction.

Simon & Lydiah (2014) investigated teachers’ preparedness in the integration of Information Communication Technology in public secondary in Kenya. The study revealed that the level of teachers’ preparedness and awareness is low. Although 90 per cent of the teachers felt that learning computers contributes to the development of the country, majority of them have not yet integrated ICT in the teaching learning process in public secondary schools. Teachers need to be encouraged to buy personal computers which they can use while in and out of school to increase teachers’ perception on ICT.

Sipila (2014) investigated on the educational use of Information and Communication Technology in Finland, how ICT is included in teaching and learning, the level of teachers’ digital competence and the teachers’ opinion on what factors might be restraining their use of ICT in schools. It was found that teachers who have advanced ICT competence use ICT frequently in education. The majority of teachers do not have the means or knowledge to fully use ICT in promoting learning. There still are

contradiction between the formal structure of educational institutions and daily classroom practices.

Vanderline et.al. (2015) studied two sets of data which contained measurements on the use of ICT in primary schools on one set and on the other the contributing conditions on the use of ICT. In both data sets, use of ICT refers to different type of uses, they are- basic ICT use, ICT as a learning tool and ICT as an information tool. The contributing conditions refer to variables situated on the individual teacher level, their level of ICT competences, ICT professional development, etc and the school organization level (e.g. ICT school vision, ICT leadership, etc) that support or hinder the use of ICT for teaching and learning.

2.2 Research on ICT: A National Scenario

Chaudhary (1990) tried to find out the attitude of primary teachers towards School Television (STV) and its relationship with mass media behavior and job satisfaction. The study revealed that custodian teachers had a favorable attitude towards STV and their attitude was independent of their personal and academic characteristics. STV was perceived as an acceptable medium for teaching students and for presentation of instructional material irrespective of their personal and academic characteristics. It was also found that there was a positive relation between the primary teachers' attitude towards STV and their job satisfaction.

Napapongs (1993), in his study on the effectiveness of video cassettes in an educational technology course for undergraduate student teachers of engineering technology, compare the relative effective of the treatment variables viz., a programme video cassette, instructional video cassettes, and conventional teaching and also study the interaction of the treatment variables with the content variables, viz. verbal learning and skill learning. The study revealed that the programmed video-cassette yielded far more gains than the instructional video-cassette and the conventional teaching. It was also found that the conventional teaching yielded more gains than the instructional video-cassette.

Dash (1997) examined the reactions of 26 primary school teachers of Gwalior district, Madhya Pradesh (India) to a teacher-training program offered via interactive television. Data were collected related to the contents and their presentation,

interaction between experts and participants, technology-related matters, and activities at the training centre. Results indicated that there was a favorable reaction towards training through interactive television.

Thatte (1998) experimented on the relative effectiveness of Programmed Learning and learning through Audio visual Aids, with reference to certain selected topics from the syllabus of Science for classes 5 to 8 in Greater Bombay. The experiment revealed that audio visual aid was more effective than the programmed learning method and the traditional method in terms of achievement. Programmed learning method and audio visual method are more successful when the classes are small and that they are more effective for average students.

Thirumurthy & Sundaram (2003) studied the influence of the elective course, computers for young children in India. They explored issues related to the use of technology in Indian schools, drawing on information from a variety of sources, such as interviews with parents and teachers, school visits, government information, magazine and journal articles. Examined India's cultural and educational environments; diversity of parents' and educators' attitudes about technology; and steps needed to fully integrate technology into school curricula.

Deena & Desai (2004) tried to find out the effectiveness of Multimedia package, carried an Experimental study "Comparative Study on the Efficacy of Teaching through the Traditional Method and Multimedia Approach in the Subject of Home Science. The students were found to have favorable opinion towards the Multimedia Approach.

Lukose (2005) studied the perception and performance of student teachers at secondary level on the use of self learning materials, and found that the performance in achievement test of student teachers with regard to computer assisted instruction, instructional module and multimedia package are better than that of student teachers who followed conventional lecture method of learning.

Annaraja & Joseph (2006) examined the level of attitude of teacher trainees towards ICT and tried to find if there is any association between the subjects' attitude towards ICT and their father's and mother's educational qualification and family income. It was found that majoring of the teacher trainees have high level of attitude towards

ICT and, female teacher trainees have higher level of attitude than that of the male teacher trainees. The research study also revealed that there was no significant association between teacher trainees' attitude towards ICT and their family income, their father's and mother's income.

Patil (2006) found from his study "Development of Multimedia Instructional System on Computer Education for B.Ed. Pupil Teachers" through a pilot testing of two groups pre-test and post-test design that no significant difference was found between the performance of the pupil teachers of control and experimental group on pre-test. Then in the post test, significant difference was found between the performance of the pupil teachers of control group and experimental group.

Rajasekar and Vaiyapuri (2007) examined the knowledge and attitude towards computer of higher secondary teachers' in Cuddalore district of Tamil Nadu, India. Majority of the teachers have favorable attitude towards the use of computer. No significance difference was found among the male and female teachers, between the teacher working in urban and rural schools, between the teachers in government and private school, and neither between the secondary school teachers and postgraduate teachers. However the study found that graduate teachers have an unfavorable attitude towards computer as compared to the attitude of teachers in secondary and postgraduate teachers.

Chandra (2008) studied the relationship of computer related attitudes with age, computer experience, cognitive style, and personality factors of secondary school teachers and discovered that age was negatively correlated with the attitudes of teachers. The teacher with higher computer experience showed significantly higher computer confidence, liking for the computer and attitude towards the usefulness of the computer than that of the teacher with low computer experience working with the computer. Cognitive style was found to be related with computer related attitudes. The factors like ego strength, shyness, tough-mindedness, depression, conservatism, group dependence, frustration, extraversion, anxiety, tough poise and independence were not related to computer attitudes.

Khan (2009) examines the ICT curriculum in the teacher education programmes of Kerala in the context of globalization. It compares curriculum in India and other developed countries and from the study it was found that the developed countries

have very high technical oriented curriculum than India has. Personal interviews and discussions were conducted among the teacher educators who are handling ICT in college. The study also revealed that there is a wide gap between ICT curriculum and changing needs of the society taking things on a global perspective. The teachers are not competent enough to handle ICT paper in teacher training colleges and there was no specialist teacher to handle the ICT paper.

Rathod (2009) study on the Evolving ICT Enabled Strategies for Teaching Science Catering to the Learning Styles of the Students in Kalarav School, Halol Di Pachmahal (Gujarat), the study revealed that due to the dominance of lecture based traditional instruction in the Science class; many students are losing their interest from science subject. He found out that project based learning ICT has the potential to cater diverse needs of learners.

Kumar (2009), in his study, tried to find out the attitude of Lucknow City students and teachers towards educational television programmes and the impact of these programmes on learning by students. For data collection, Attitude towards Educational Television Programmes Scale and Achievement Test in Geography and Social Studies were used. The result shows that both the students and the teachers have favorable attitude towards educational television programmes. On the technical aspect of programme production such as clearness of sound and picture, the students and teachers were generally satisfied with it.

Sisiliya (2011) studied on the efficacy of instructional methods and materials prepared and uses in the selected schools of Manipur state, found that the teachers always used lecture method, followed by question answer, discussion and tutorial method. The rarely used methods are demonstration, dramatization, field trip, debate and group work. B.Ed. teachers have more favourable attitude than non B.Ed. teachers towards instructional methods and materials. Majority of students had favourable attitude towards instructional methods. Students who were taught by the computer assisted instructions learned more and showed higher achievement than those who were taught with conventional method of teaching.

Kumari (2012), found that there is a high correlation between computer experience and computer self-efficacy, and there is high correlation between frequency of access to computers with computer self-efficacy. Pre-service teachers who have computer

access and who do not have computer access at their homes and college, have high correlation.

Chaudhary (2012), in “Effectiveness of ICT Training Program on Digital Literacy” commenced for In-service and Pre-service teachers and the effectiveness of ICT training program on teacher educator’s digital literacy. With the development of ICT in education, teacher-educators must be equipped with the skills and knowledge of ICT in the classroom teaching learning activities. The study found out that most teacher-educators were not aware of the use of computer but after a training program was held large number of the teacher-educators were fluent and skilled in the use of ICT. To prepare the new generations of ICT literate teachers, the teacher-educators must set an example to the student-teachers first.

Abrahamal & Wadhvani (2013) studied on the ICT integration in In-service teacher education programmes. The study was confined to the programmes conducted by SCERTs, DIETs, KVS and NVS in six states selected-Delhi, Uttar Pradesh, Mizoram, Haryana, Kerala and Rajasthan. All states covered in this study had in-service programmes in ICT. A large majority of the in-service teachers who constituted the sample have knowledge regarding on how to use computers and had basic knowledge of computers. Intel and Microsoft were the key service providers among the sample of the study. The ICT Curricula and its training use both Microsoft Windows in all states and free software GNU/Linux OS also in the in-service programmes. The training for ICT as a tool for pedagogy was covered along with basic competencies.

Gupta & Singh (2014) conducted a study on the usage of e-learning tools and the gap in the existing teacher education curricula in India, to identify the status of e-learning in the curricula of teacher education, the infrastructural facilities, and usage of e-learning tools for instruction by teacher educators and trainee teachers. The findings of the study revealed that though the curricula related to e-learning was ample in the selected university but the infrastructural facilities were not accomplished in many terms like internet connection and time provided to use it. The student-teachers were skilled with the basic computer applications but they are lacking the skill of using various special skills required for e-learning. The usage of e-learning tools by teacher educators, such as, email, chat, discussion groups, downloading the content was average but they are not involved in preparing online courses, taking online classes,

video conferencing and uploading the educational content. Similar results were found in case of trainee teacher for which they are motivated to use the e-learning tools.

Abraham (2015) assessed the computer knowledge and internet skills of the rural youth in Prakasam district, Andhra Pradesh, India. Majority of the students have computers knowledge but still do not have the power-point presentation skills. Government need to organize training on computers and internet in rural areas as well as in the small towns of Andhra Pradesh, focus should be laid on women to increase the learning ability among the girls.

Chuaungo (2016) studied the use of ICT for education among B.Ed students and teachers in Mizoram. The study found that the application of ICT in teaching is still at an infancy stage, development of ICT skills and confidence in student-teachers was very minimal and limited. ICT is not properly integrated into the processes of teaching-learning. The student-teachers were not provided enough opportunity and time for practice and application of ICT in their activities. From the study it was found that there is inadequate facilities and equipments, poor internet connection, and inadequate number of ICT experts in the institution. The teacher-educators were of the view that there should be requirements in respect to ICT skills and experience for teacher recruitment as well as for in-service teachers.

2.3 Variable-wise Analysis of the National and International Studies Reviewed

Variable-wise analysis of the abstracts given under National and International Scenario has been presented under the following five sub heads:

a) Studies relating to perceptions and attitude:

Out of the 44 studies reviewed only 9 relate to the perceptions, attitude and practices relating to use of ICT. Chaudhary (1990) studied the attitude of primary teachers towards School Television and its relationship with mass media behavior and job-satisfaction. Kumar (1993) examined the attitude of students and teachers of Lucknow towards educational television programmes and the impact of these programmes on learning by students. Dash (1997) studied the reactions of primary school teachers of Gwalior district, Madhya Pradesh to the interactive television offered in teacher-training programme. Annaraja & Joseph (2006) studied the attitude of teacher trainees towards ICT and its relationship with their

father and mother educational qualification and family income. Wozney, Venkatesh & Abrami (2006) in their study “Implementing Computer Technologies: Teachers’ Perceptions and Practices” in Montreal, Canada; investigated the personal and setting characteristics, teacher attitude, and current computer technology practices. Boon et.al (2007), Rajasekar & Vaiyapuri (2007) Martinovic & Zhang (2012) focused their research on the perceptions and attitudes of teachers on current computer technology practices. Chandra (2008) studied the relationship of computer related attitudes with age, computer experience, cognitive style, and personality factors of secondary school teachers and discovered that age was negatively correlated with the attitudes of teachers.

b) Studies relating to challenges of ICT:

An examination of the reported abstracts further shows that 5 out of the 44 studies reviewed are on challenges/barriers/factors restraining the use of or integration of ICT into the teaching learning or pre-service and in-service training of teachers. Glenn and Carrier (1986) in their study on “*Teacher Education and Computer Training: An Assessment*” examined the teachers’ opinions on the challenges of training-teachers to use computer effectively in classroom and their suggestions to meet the challenges of preparing tomorrow’s teachers for a technology age. Thirumurthy & Sundaram (2003) studied the influence of the elective course, computers for young children in India. Goktas et.al (2009) studied the main barriers and possible enablers of ICTs integration into pre-service teacher education programmes in Turkey’. Jung (2005) in his research examined the challenges and new possibilities of the use of ICT in teaching learning situations. Likewise, Sipila (2014) besides investigating the use of ICT in teaching & learning and level of teachers’ digital competence also examined the teachers’ opinions on factors restraining the use of ICT in schools in Finland.

c) Studies relating to preparedness or readiness of teachers/student-teachers for the use of ICT:

Only 8 studies out of the 44 reported under the relevant section, are relating the preparedness of teachers or student-teachers on the use of ICT in classroom teaching. Rajasekar & Vaiyapuri (2007) conducted a study in Cuddalore district of Tamil Nadu on Knowledge of higher secondary teachers about computers.

Markauskite (2007) while examining the nature of trainee teachers' ICT literacy identified their cognitive and technical capabilities through exploratory and confirmatory factor analysis. Gill & Dalgarno (2008) explored first year teacher education student preparedness to use ICTs in the classroom. Anderson, Kennedy-Clark & Galstaun (2012) studied on developing Information and Communication Technologies (ICT) competency in pre-service teacher education Units of Study. Mndzebele(2013) in her study in Swaziland on teachers' readiness in using ICT in the classroom. Simon & Lydiah (2014) investigated teachers' preparedness in the integration of ICT in public secondary in Kenya. Sipila (2014) while investing the educational use of ICT in Finland also studied the level of teachers' digital competence and the teachers' opinion on what factors might be restraining their use of ICT in schools. Abraham (2015) assessed the computer knowledge and internet skills of the rural youth in Prakasam district of Andhra Pradesh

d) Studies on integration of ICT in teaching and learning

Almost one fourth (i.e. 11 out of 44 studies) of the total studies reviewed relate to the various issues with regard to the integration of ICT in teaching-learning process. For instance Napapongs (1993) studied on the effectiveness of video cassettes in an educational technology course for undergraduate student teachers of engineering technology. Lukose (2005) studied the perceptions and performance of student teachers at secondary level on the use of self learning materials. Kiridis (2006) worked on the potentials of integration of the new technologies in public primary education. Khan (2009) examined the ICT curriculum in the teacher education programmes of Kerala in the context of globalization. Goktas et.al (2009) conducted a study on the barriers and possible enablers of ICTs integration. Brun & Hinostroza (2011) in their study, on the integration of ICT in initial Teacher Education in Chile, examined the existence of institutional policies; the overall infrastructure, the availability and access to ICT resources, and the availability and quality of technical and pedagogical support. Likewise Martinovic & Zhang (2012) took up their research on expectations and attitudes of pre-service teachers towards integrating ICT in teaching. Mitchell & Laski (2013), and Chemwei et.al. (2014) determined the level of integration of ICT by the teacher educators in the training college in Kenya. Simon & Lydiah (2014) investigated teachers' preparedness in the integration of ICT in public

secondary schools in Kenya.

e) Studies relating to the level of use of ICT

Another area of research covered by the studies reviewed is the diffusion/use of ICT in teaching learning process by teachers in schools and by prospective teachers. Eleven (11) out of the 44 studies reviewed were relating to this area. Wozney et. al. (2006) in Montreal, Canada; investigated the current computer technology practices of teachers in relation to their personal and setting characteristics. Grove (2008) in her “Student Teacher ICT Use: Field Experience, Placements and Mentor Teacher Influences” identified factors enhancing student teachers’ learning to teach effectively in digital classroom. Kumar (2009) studied the utilization of information and communication technologies in training the B Ed student teachers in Tamilnadu. Sisiliya. (2011) in her study on the efficacy of instructional methods and materials prepared and used in the selected schools of Manipur state. Musarurwa (2011) examined the level of use of ICT in Zimbabwe’s teacher education colleges. Sahin (2012) in an experimental study investigated pre-service teachers’ perspectives of the diffusion of information and communication technologies (ICT) in elementary education and the effect of case-based discussions (CBDs). Konstantinos et. al. (2013) investigated the views of ICT teachers in relation to the full and effective use of ICT in all aspects of school reality and the obstacle teachers’ encounter in their teaching process. Gupta & Singh (2014) conducted a study on the usage of e-learning tools and the gaps in the existing teacher education curricula in India. Sipila (2014) investigated on the educational use of ICT in Finland, how ICT is included in teaching and learning, the level of teachers’ digital competence and the teachers’ opinion on what factors might be restraining their use of ICT in schools. Vanderline et. al. (2015) studied the use of ICT in primary schools and the contributing conditions on the use of ICT and Chuaungo (2016) studied the use of ICT by B.Ed. students and teachers in Mizoram .

2.4 Justification of the Present Study in Relation to the Studies Reviewed

.A close examination of the related studies reviewed in this chapter reveals that research on ICT in elementary teacher education has not attracted the adequate attention of researchers in India in general, and north east India & Mizoram in

particular as not even a single study could be located on any of the variables covered under the present study. Since the number of research conducted relating to ICT in elementary teacher education is still a handful, the researcher was inspired to take up a study on the use of ICT in elementary teacher education programmes.

Chapter 3

Methodology and Procedure

Chapter-3

Methodology and Procedure

3.0 Introduction:

The objectivity, reliability, validity and generalizability of any research largely depend on the appropriateness of its methodology. Thus, this chapter, under its various sections explains the questions of what, why and how relating to the method of study, population, tools of data collection and statistical techniques used by the scholar in the completion of this study. The chapter has been organized under the following sections.

- 3.1 Method of Research
- 3.2 Justification for the Selection of DIET Aizawl and Lunglei for Study
- 3.3 Population and Sample of Student-teachers
- 3.4 Tools of Data Collection
- 3.5 Administration of Tools and Collection of Data
- 3.6 Sources of Data
- 3.7 Data Analysis Procedures.

3.1 Method of Research

Since the investigator was interested in exploring the status of ICT infrastructure, and opinions & preparedness of student-teachers on the use of ICT, therefore, she decided to employ the descriptive method that generally describes and interprets the existing conditions or relationships, opinions that are held, process that are going on, effects that are evident, or trends that are developing. It is primarily concerned with the present, although it often considers past events and influences as they relate to current conditions.

Besides the descriptive method the investigator also used the content analysis method/techniques for analyzing her qualitative data relating to the first objective on examination of ICT components in elementary teacher education programmes in the DIETs that was collected from booklet on Curriculum for Diploma in Education (D.Ed.), Published by MBSE, Aizawl Vide Notification No. MBSE/Acad.(S)/2007-08/177, Dated 31st May 2013, and Prospectus & Syllabus for Two-year Diploma in Teacher Education (D. T. Ed.) published by the DIET Aizawl in 2000.

3.2 Justification for the Selection of DIET Aizawl and Lunglei for Study

The reasons for the selection of DIET Aizawl and Lunglei for study have been explained as under:

1. Firstly, there are 8 DIETs in Mizoram; of which only two, namely, DIET Aizawl and DIET Lunglei are full-fledged DIETs recognized by the NCTE, and offer pre-service training. The rest six are called mini-DIETs and offer only in-service training programs.
2. Secondly, the focus of study was the survey of opinions and preparedness of student-teachers relating to ICT, therefore, the scholar had no other choice than to select these two DIETs. The list of all 8 DIETs in Mizoram with their location and address has been given in Appendix-A.

3.3 Population and Sample of Student-teachers

The population of the present study, with regard to the student-teachers, consisted of 200 student-teachers, who, at the time of data collection, were pursuing their pre-service elementary teacher training course in DIET Aizawl and Lunglei. Since the structure of population was well defined and size of population was small, therefore the scholar decided to study the whole population without resorting to any sampling. However, it is pertinent to mention here that the scholar had initially collected data from all 200 student-teachers (100 each from both DIETs), but in view of incomplete responses, 8 student teachers from DIET Aizawl and 3 from DIET Lunglei were not considered for final analysis. Thus finally 92 student teachers from DIET Aizawl and 97 from DIET Lunglei were the respondents in this study. The details of the actual number of respondents from both DIETs have been provided in Table 3.1.

Table-3.1

Population and Sample of from Sample DIETs

DIET Aizawl				DIET Lunglei			
Population	No. of Respondent			Population	No. of Respondent		
	Male	Female	Total		Male	Female	Total
200*	40	52	92	200*	53	44	97

**Student-teachers of both 1st and 3rd semester*

3.4 Tools of Data Collection

Keeping in view the objectives of the present study the following were the tools used by the researcher:

- 1) Information Schedule and Checklist to examine the condition of the ICT infrastructure of the DIETs was developed by the researcher. (see in Appendix-B).
- 2) Opinionnaire to study the opinions of the student-teachers on various issues relating to the use of ICT in the teacher education was developed by the researcher (see in Appendix-C).
- 3) Questionnaire for assessment of preparedness of student-teachers to use ICT was developed by the researcher (see in Appendix D).

a) Development of Information Schedule and Checklist

To examine the ICT infrastructure and level of its use in both DIET Aizawl and Lunglei (Objective No. 2), an information schedule-cum-checklist consisting of 8 questions was developed by the investigator with due consultation of the relevant literature, and discussion with experts and supervisor. Besides, the scholar had maintained her field for recording significant observations relating to ICT infrastructure.

b) Development of Questionnaire

As there was no readymade tool available to assess student-teachers preparedness (Objective No.3) for the use of ICT in teaching learning, therefore, the researcher developed a questionnaire for this purpose. The final draft of this questionnaire, after

deletion and addition of items based on the suggestions of experts and supervisor, has 24 items, where the respondents had to answer 'Yes' or 'No'.

c) Development of Opinionnaire

To study the opinions of student-teachers on various issues relating to the use of ICT in teacher education programmes (Objective No. 4), an Opinionnaire was developed by the researcher with due consultation of relevant literature and discussions with experts and supervisor. The opinionnaire consisted of 20 statements. The researcher used the Likert technique of three point scale, namely- Disagree, Neutral, and Agree. The respondents had to answer according to their degree of agreement or disagreement.

3.5 Administration of Tools and Collection of Data

In this study, all the tools were self administering scale. The investigator personally visited both DIETs. The information-cum-check list on ICT infrastructure was given to the Principals for eliciting the required information. Other two tools were administered on the student teachers, 100 student-teachers each from the said DIETs. However, before actual administration of these tools proper rapport was established with them through informal discussion and explaining the purpose of the study. They were also ensured that data so collected will be kept strictly confidential and be used only for research purposes. The instruments were given to the student teachers. They were given instructions on how the questionnaires were to be answered. Great stress was laid on the fact that there is no right or wrong answer in both questionnaires, and they should ensure that they do not omit any question. Enough time was given to them so as to help them in making their right choice with regard to their degree of agreement or disagreement with the issue involved in the item/statement.

3.6 Sources of Data:

The scholar has used both primary and secondary sources of data for collecting relevant information for the realization of the objectives of her study.

a) Secondary Sources:

The data relating to the first objective i.e. examining of ICT components in elementary teacher education programmes in the DIETs under study was collected

from booklet on Curriculum for Diploma in Education (D.Ed.), Published by MBSE, Aizawl Vide Notification No. MBSE/Acad.(S)/2007-08/177 Dated 31st May 2013, and Prospectus & Syllabus for Two-year Diploma in Teacher Education (D. T. Ed.) published by the DIET Aizawl in 2000. Besides these two documents the researcher had also conducted unstructured interview with the principals of both DIETs in relation to the ICT component in the Diploma in Education offered by their institutes.

b) Primary Sources:

On the other hand the data relating to the second, third and fourth objective; viz. availability and level of use of ICT infrastructure, opinions of student-teachers on the use of ICT in teacher education programmes, and preparedness of student-teachers in the use of ICT in teaching and learning; were collected directly from the student teachers through the questionnaires specifically developed by the researcher for this purpose.

3.7 Data Analysis Procedures.

The data relating to the various objectives of the study has been analyzed by using different statistical techniques depending on the nature of data. For instance:

- a) the qualitative data relating to the first objective on examination of ICT components in elementary teacher education programmes in the DIETs under study; that was collected from booklet on Curriculum for Diploma in Education (D.Ed.), Published by MBSE, Aizawl and Prospectus published by the DIET Aizawl in 2000; was analysed through content analysis of these document.
- b) the data relating to ICT infrastructure and opinions of student-teachers on the use of ICT, that was basically a nominal data, was analyzed by using frequency count and percentages.
- c) the data relating to association between the DIET and opinions of student-teachers on the use of ICT was analysed by using the chi-square test of independence.
- d) the data relating to the significance differences between student-teachers of two DIETs in relation to their preparedness for the use of ICT was analysed by applying t-test for percentages.

Chapter 4

Data Analysis and Interpretation

Chapter- 4

Data Analysis and Interpretation

4.0 Introduction

This chapter gives a detailed account of analysis and interpretation of data relating to the various objective of the study. For the meaningful organization and presentation, this chapter has been presented under the following five sections that relate to the objectives of the study.

- 4.1: ICT Component in Elementary Teacher Training Programs in DIETs.
- 4.2: ICT Infrastructure in DIETs
- 4.3: Opinions of Student-teachers on the Use of ICT
- 4.4: Status of Preparedness of student-teachers for the Use of ICT
- 4.5: Suggestions for Integration of ICT In Pre-Service and In-Service Teacher Education

SECTION 1

4.1: ICT Component in Elementary Teacher Education Programs in DIETs

This section deals with the study of the ICT components in elementary teacher education programmes in the DIETs in Aizawl and Lunglei in the light of the National Curriculum Framework for Teacher Education (NCTE).

The NCTE prescribed syllabus is followed by the DIET's in Aizawl and Lunglei with minor modifications and adaptations. Since the study was focused on the ICT component in the syllabus of the elementary teacher education programme, the investigator concentrated on the study of ICT component in the syllabus of the D.El.Ed. After examining the syllabi of D.T.Ed. offered by the DIETs till 2014, and of D.Ed. implemented by both DIETs from 2014, it was found that: Both the DIETs have been offering a Two-year Diploma in Teacher Education (D. T. Ed.) till 2014, the same from 2014 has been replaced by Two-year Diploma in Education (D.Ed.) from 2014.

1. The curriculum for two year elementary teacher education programme followed by both DIETs consist of courses on - Child Studies, Educational Studies, Contemporary Studies, Curriculum and Pedagogic Studies, Optional pedagogy (social science education, language education, mathematics education, science education), Practicum and School Internship. In these broadly categorised course there is no subject related to ICT or Educational Technology.
2. There was a full optional paper on Educational Technology under additional specialization in Diploma in Teacher Education (D. T. Ed.) till 2014. However, in the new course adopted for Diploma in Education (D.Ed.) by both DIETs from 2015 there is no paper on Educational Technology or ICT (See Appendix D and Appendix E).
3. The committee constituted by NCTE for the development of Syllabi for D. El. Ed. has submitted a draft curriculum package to NCTE. The committee in its proposed syllabi for D. El. Ed. has included two half papers on Pedagogy and ICT integration across the Curriculum-I, and Pedagogy and ICT integration across the Curriculum-II of 3 credits each in 1st and 2nd year of D. El. Ed., respectively. However, the said curriculum package submitted by the said committee has not yet been approved and implemented by the NCTE.
4. Fortunately, National Institute of Electronic and Information Technology (NIELIT) has provided 30 computers to DIET Aizawl and is planning to provide 21 computers to the DIET Lunglei as well. This has quite a positive impact on the teacher education programme in the DIET Aizawl. Although there was no computer related subject in D. El. Ed. syllabus as per the NCFTE 2009, the DIET Aizawl, keeping in view the importance of ICT, was conducting two classes per week on Information Technology.

SECTION 2

4.2 ICT Infrastructure in the DIETs

This section deals with the study of data relating to the ICT Infrastructure and level of its use in Aizawl and DIET Lunglei. The study was undertaken with an information schedule-cum- checklist consisting of 8 questions developed by the investigator as mention in chapter 3. The respondents' answers to the issues in this questionnaire were recorded. Item wise analysis of the responses has been presented as under.

a) Status of Power Supply, Fax Machine Land Line Telephone & Cable/WLL/DTH TV

The Table-4.2.1 shows that DIET Aizawl, except solar power, has all other facilities like reliable electricity, stand by generator power, inverter, landline telephone, fax machine, cable TV etc., whereas the DIET Lunglei has only reliable electricity, landline telephone and fax machine, but does not have power backup, such as, solar power, inverter and generator power.

In terms of infrastructure facilities it seems that DIET Aizawl is relatively better equipped than DIET Lunglei. However, one fails to understand why DIET Lunglei is being neglected when both of these DIETs have been conducting similar job relating to pre-service and in-service training for elementary school teachers. May be DIET Aizawl being located in capital city, gets more and easy attention of state level educational administrators and policy makers. Besides Aizawl being the biggest district having much more number of schools and teachers than Lunglei district, it might be getting larger chunk of funds.

b) Status of ICT Unit

A quick glance at Table-4.2.2 reveals that DIET Aizawl is privileged with a separate ICT unit and lab with 30 computers and related accessories provided by NIELIT, whereas the ICT unit in DIET Lunglei is in a bad state. However, while discussing this matter with the principal DIET Lunglei, it was pleasing to know that NIELIT is likely to provide 20 computers with required accessories to the DIET Lunglei in near future.

c) Availability of ICT related Facilities and Equipment in DIETs:

It is evident from Table-4.2.3 that there are 45 computers available in DIET Aizawl, of which 30 are in the computer lab as mentioned in Table-4.2.2, whereas there is no computer in DIET Lunglei. There are 17 laptops in DIET Aizawl and 8 laptops in DIET Lunglei. Each of the DIET have server with terminal. DIET Aizawl has 22 internet nodes. Both have scanner. Neither of them have web camera. DIET Aizawl have 22 modem where as DIET Lunglei have 2. DIET Aizawl has 7 broadband antennas and DIET Lunglei have 2. Video camera is available in DIET Aizawl but not in DIET Lunglei. DIET Aizawl has Dish TV connection whereas there is no connection in DIET Lunglei. Both have institutional website. Video conferencing facilities are not available in both the DIETs.

Table -4.2.1
Status of Power Supply, Fax Machine Land Line Telephone& Cable/WLL/DTH TV

Sl. No.	Facilities	DIET Aizawl	DIET Lunglei
1.	Reliable electricity	Yes	Yes
2.	Solar power	No	No
3.	Generator power	Yes	No
4.	Inverter	Yes	No
5.	Landline telephone	Yes	Yes
6.	Fax machines	Yes	Yes

Table-4.2.2
Status of ICT Unit in the DIET Aizawl and DIET Lunglei

Sl. No.	Facilities Relating to ICT Unit	DIET Aizawl	DIET Lunglei
1.	Separate unit	Available	Not Available
2.	Computer lab for ICT classes	Available	Not Available
3.	Number of computer in the Lab	30	Nil*
4.	Computer has been used	For more than 8 years	No

**NIELIT is likely to provide 21 Computers with accessories*

Table-4.2.3
The ICT Facilities Available in DIET Aizawl and DIET Lunglei

Sl. No.	Items	DIET Aizawl (Number)	DIET Lunglei (Number)
1.	Computers	45	Nil*
2.	Laptops	17	8
3.	Server with Terminals	1	1
4.	No. of Internet Nodes	22	-
5.	Scanner	1	1
6.	Web camera	-	-
7.	Modem	22	2
8.	Broadband Antenna	7	2
9.	Video Camera	1	-
10.	Dish TV connection	1	-
11.	Educational CDs/DVDs	-	-
12.	Radio	-	-
13.	Institution blog	1	-
14.	Institution website	1	1
15.	Subject Specific Software in Computers	TMS, etc	-
16.	Video Conferencing Facility	-	-

**NIELIT is likely to provide 20 Computers with accessories*

d) Operation and Maintenance of ICT Facilities

The computers in the DIET of Aizawl are generally operated by the office staff and lecturers form the Technology cell (Table-4.2.4), In DIET Lunglei the ICT facilities are operated by the office staffs and lecturers. In times of repairmen and maintenance, the office staffs and private firms took care of it in DIET Aizawl and the office staffs of DIET Lunglei took care of the repairmen and maintenance of the ICT facilities available.

e) Computer Fee, Level of Use and Maintenance of ICT Facilities

A quick glance at Table-4.2.5 shows that both of DIETs under study neither offer any computer course nor charge any computer fee from their student-teachers. However, the DIET Aizawl conducts two IT classes per week, and its computer lab remains open throughout its working hours and student teachers can access it during their free time but not after classes are over. On the other hand there is no computer available for the student-teachers in DIET Lunglei.

f) Utilization of ICT Lab

The data vide Table-4.2.6 shows DIET Aizawl makes optimum use of its ICT lab as its administration, database, library and research projects are supported by ICT, whereas DIET Lunglei does not have any ICT lab.

g) Additional ICT Infrastructure Proposed

When asked what additional ICT infrastructure they require using it more effectively, DIET Aizawl proposed for smart board, flat TV and a good sound system, whereas DIET Lunglei being less equipped they proposed for generator, projector and Smart TV. It was surprising to know that both DIETs did not propose any thing relating to the educational software, CDs and DVDs etc. (See Table-4.2.7)

SECTION-3

4.3 Opinions of Student-teachers on the Use of ICT

This section deals with the analysis of data relating to the opinions of student-teachers of DIET Aizawl and Lunglei on the various issues relating to the use of ICT. The study was undertaken with a questionnaire consisting of 20 items developed by the researcher as mention in chapter 3. The respondents' answers to the issues in this

Table-4.2.4
Operation and maintenance of the ICT facilities in DIET Aizawl and DIET Lunglei

Sl. No	Operation, repair and maintenance	DIET Aizawl	DIET Lunglei
1.	Personnel operating the ICT facilities	Office Staff and lecturers from technology cell	Office Staff and lecturers
2.	Repair and maintenance	Office Staffs and private firm (NIELIT)	Office Staff

Table-4.2.5
Computer Fee, Level of Use and Maintenance of ICT Facilities

Sl. No.	Computer and other related fees in	DIET Aizawl	DIET Lunglei
1.	Computer fee	No	No
2.	Computer course	No	No
3.	Use of computer by the student-teachers	2 class per week and lab open for student-teachers during working hours	No
4.	Use of computers after class by student-teachers	No	No
5.	Use of internet after class by student-teachers	No	No

Table-4.2.6
Other Institutional Functions Supported by ICT in DIET Aizawl and DIET Lunglei

Sl. No.	ICT Supported Functions	DIET Aizawl	DIET Lunglei*
1.	Administration	Yes	No
2.	Database	Yes	No
3.	Library	Yes	No

**NIELIT is likely to provide 21 computers with accessories*

Table-4.2.7
Additional ICT Infrastructure Proposed by Teacher Educators of both DIETs to use Technology more Effectively

Sl. No	Additional ICT Infrastructure Proposed by Teacher Educators	
	DIET Aizawl	DIET Lunglei
1.	Smart Board	Generator
2.	Flat TV	Projector
3.	Sound System	Computers Smart TV

questionnaire were recorded on a three point scale, namely- Disagree, Neutral, and Agree. Item wise analysis of their opinion has been presented as under.

4.3.1 Liking for the Use of Advanced ICT

A quick glance at data vide Table No- 4.3.1 shows that majority of the student-teachers i.e. 86% from DIET Aizawl and 96% from DIET Lunglei, like using advanced ICT, whereas, 10% of them from DIET Aizawl and 4% from DIET Lunglei are not sure about their liking of ICT. However, in the case of DIET Aizawl 4% of the student-teachers do not like using ICT.

The same table also shows that the chi-square value of 6.73; for association between student-teachers' opinion on the statement that their like of the use of advanced ICT and the DIET they study in, is significant at .05 level. From this finding it can be concluded that there is a clear cut association between the opinion of student-teachers' liking of the use of advanced ICT and the DIET they study in. A close examination of data in various cells on this issue, vide Table 4.3.1, reveals that this association is because of the large variation in opinions of respondents from both DIETs. Thus the null hypothesis (Ho-1) of no association, in relation to the issue under reference, is rejected.

4.3.2 ICT Scares Me

It was pleasing to know from Table No-4.3.2, that majority of the student-teachers i.e. 83% from DIET Aizawl and 89% from DIET Lunglei opined that they are not scared of ICT. On the other hand 10% of them from DIET Aizawl and 9% from Lunglei reported that they are scared of ICT. And the remaining 2% from Lunglei 8% from Aizawl and are not sure whether they are scared of ICT or not.

The same table also shows that the chi-square value of 3.26; for association between student-teachers' opinion on the statement whether they are scared of ICT and the DIET they study in, is insignificant even at 0.05 level. The observed result is very much close to the result to be expected on the hypothesis of independence. On the basis of this finding it can be concluded that there is no evidence of any real association between the opinion of student-teachers on this statement and the DIET they study in. A close examination of data in various cells on this issue, vide Table 4.3.2, reveals that the absence of this association is because of the little variation in opinions of respondents from both DIETs. Thus, the null hypothesis (Ho-1) of independence or no association, in relation to the issue under reference, is accepted.

Table-4.3.1
Liking of Student-teachers' for the Use of Advanced ICT

Statement	Response	DIET Aizawl		DIET Lunglei		X ² Value, df, and Decision
		N	%	N	%	
1. I like using advanced ICT	Disagree	4	4	0	0	df=2 X ² Value=6.73* Ho-1 Rejected
	Neutral	9	10	4	4	
	Agree	79	86	93	96	
	Total	92	100	97	100	

**significant at 0.05 level; Required Chi-square Values with df=2 at 0.05=5.991 and at 0.01=9.210*

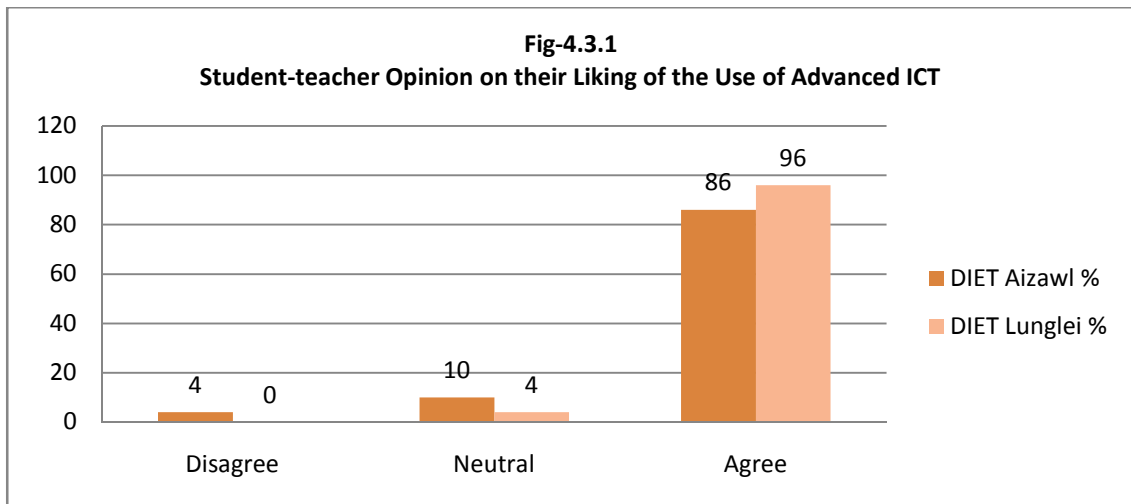
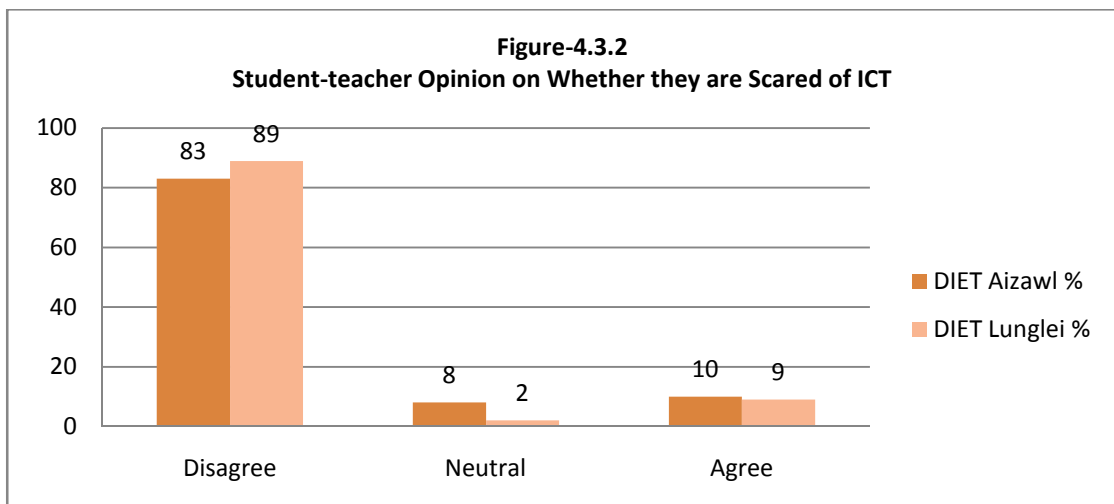


Table-4.3.2
Opinion of Student-teachers on whether they are Scared of ICT

Statement	Response	DIET Aizawl		DIET Lunglei		X ² Value, df, and Decision
		N	%	N	%	
2. ICT scares me	Disagree	76	83	86	89	df=2 X ² Value=3.26n.s. Ho-1 Accepted
	Neutral	7	8	2	2	
	Agree	9	10	9	9	
	Total	92	100	97	100	

n.s=not significant; Required Chi-square Values with df=2 at 0.05=5.991 and 0.01=9.210



4.3.3 Assistance of ICT in learning

Examination of data vide Table No-4.3.3, shows that a large majority of the student-teachers i.e. 94% from DIET Aizawl and 95% from DIET Lunglei, while expressing their opinion on this issue, opined that ICT helps them learn thing more easily. The remaining 6% and 5% of student-teachers of both DIETs are either disagreeing with this statement or not very sure about the impact of ICT in facilitating students leaning. The same table also shows that the chi-square value of 0.93; for association between student-teachers' opinion on the statement whether they find ICT helpful in their learning and the DIET they study in, is insignificant even at 0.05 level. The observed result is very much close to the result to be expected on the hypothesis of independence. On the basis of this finding it can be concluded that there is no evidence of any real association between the opinion of student-teachers on this statement and the DIET they study in. A close examination of data in various cells on this issue, vide Table 4.3.3, reveals that the absence of this association is because of the little variation in opinions of respondents from both DIETs. Thus, the null hypothesis (H_0-1) of independence or no association, in relation to the issue under reference, is accepted.

4.3.4 Discomfort in using ICT

It is evident from Table No- 4.3.4, that majority of the student-teachers i.e. 78% from DIET Aizawl and 62% from DIET Lunglei, while expressing their opinion on this issue, opined that they do not feel that ICT is making them uncomfortable. However, 15% of the student-teachers in Lunglei were not sure whether ICT is making them feel comfortable or not and 23% felt ICT is making them uncomfortable. In the case of DIET Aizawl 10% of the student-teachers feel uncomfortable using ICT while 12% of the student-teachers were not sure whether ICT is making them feel comfortable or not.

The same table also shows that the chi-square value of 7.03; for association between student-teachers' opinion on the statement whether ICT is making them feel uncomfortable and the DIET they study in, is significant at 0.05 level. From this finding it can be concluded that there is a clear cut association between the opinions whether ICT is making them feel uncomfortable and the DIET they study in. A close examination of data in various cells on this issue, vide Table 4.3.4, reveals that this association is because of the large variation in opinions of respondents from both

Table-4.3.3
Student-teachers Opinion on the Assistance of ICT in Learning

Statement	Response	Aizawl		Lunglei		X ² Value, df, and Decision
		N	%	N	%	
3.ICT helps me learn things more easily	Disagree	2	2	3	3	df=2 X ² Value=0.93n.s. Ho-1 Accepted
	Neutral	4	4	2	2	
	Agree	86	94	92	95	
	Total	92	100	97	100	

n.s.=not significant; Required Chi-square Values with df=2 at 0.05=5.991 and 0.01=9.2

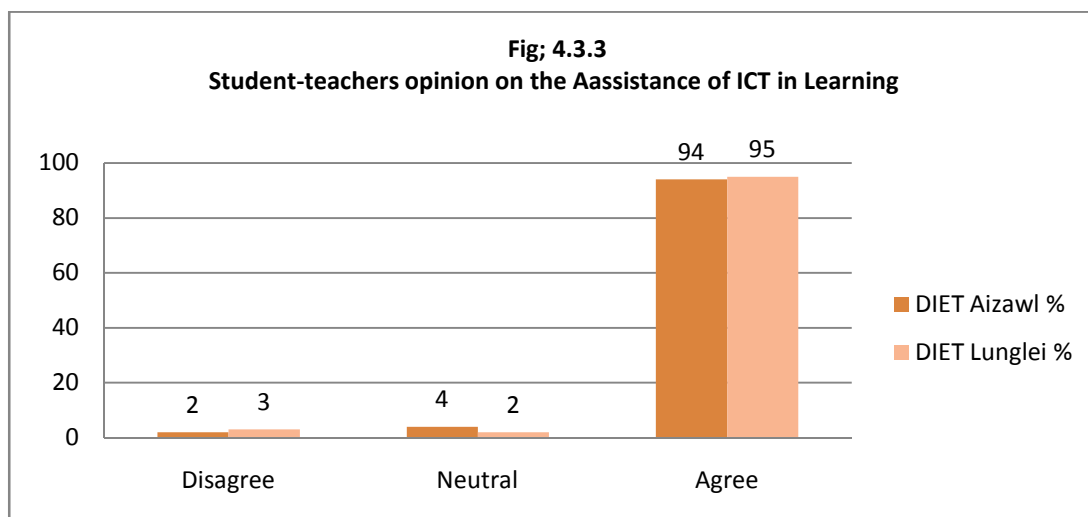
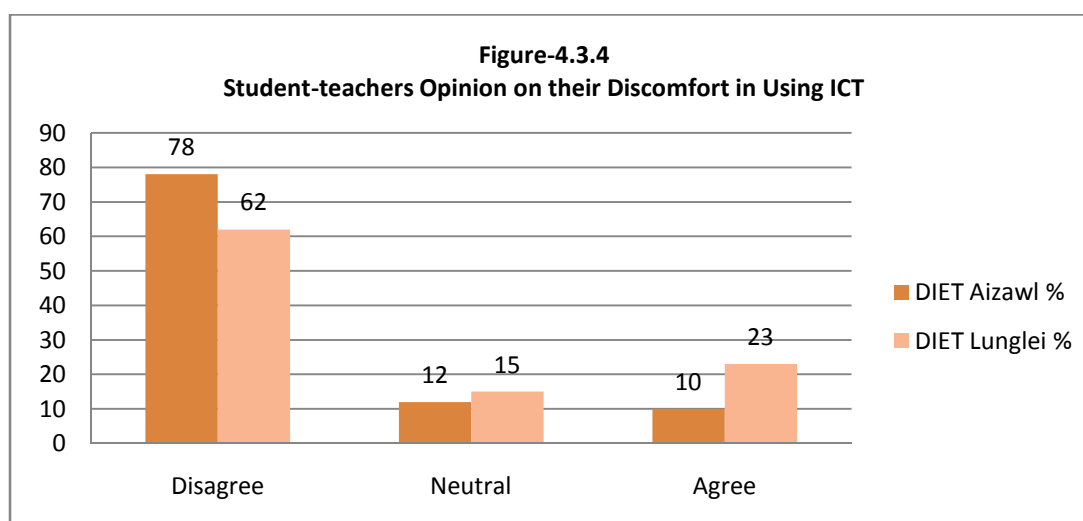


Table 4.3.4
Student-teachers Opinion on their Discomfort in Using ICT

Statement	Response	Aizawl		Lunglei		X ² Value, df, and Decision
		N	%	N	%	
4.ICT makes me feel uncomfortable	Disagree	72	78	60	62	df=2 X ² Value=7.03* Ho-1 Rejected
	Neutral	11	12	15	15	
	Agree	9	10	22	23	
	Total	92	100	97	100	

**significant at 0.05 level; Required Chi-square Values with df=2 at 0.05=5.991 and 0.01=9.210*



DIETs. Thus, the null hypothesis (Ho-1) of no association, in relation to the issue under reference, is rejected.

4.3.5 Potential of ICT if Knowledge Acquired

A careful view of the Table No- 4.3.5, showed that, majority of the student-teachers i.e. 80% from DIET Aizawl and 76% from DIET Lunglei feel that knowing how to use ICT will help them do well as a teacher. However, 18% of student-teachers from both sample DIETs are not sure whether they feel ICT will help them do well as a teacher or not. The rest 2% in Aizawl and 6% in Lunglei opined that ICT will not help them do well as a teacher.

The same table also shows that the chi-square value of 1.87, for association between student-teachers' opinion on the statement whether ICT helps them do well as teacher and the DIET they study in, is insignificant even at 0.05 level. The observed result is very much close to the result to be expected on the hypothesis of independence. On the basis of this finding it can be concluded that there is no evidence of any real association between the opinion of student-teachers on this statement and the DIET they study in. A close examination of data in various cells on this issue, vide Table 4.3.5, reveals that the absence of this association is because of the little variation in opinions of respondents from both DIETs. Thus, the null hypothesis (Ho-1) of independence or no association, in relation to the issue under reference, is accepted.

4.3.6 ICT Not Required in the Classroom Teaching

As the Table No- 4.3.6 revealed, majority of the student-teachers i.e. 86% from DIET Aizawl and 65% from DIET Lunglei disagree with the statement, they are on the opinion that they will need ICT in their classroom teaching. 9% of the student-teachers from both Aizawl and DIET Lunglei are not sure whether they will need ICT in their classroom teaching or not. In the case of DIET Aizawl only 5% are on the opinion that they will never need ICT in their classroom teaching and 26% of student-teachers in DIET Lunglei who think the same.

The same table also shows that the chi-square value of 15.07, for association between student-teachers' opinion on the statement whether they need ICT in their classroom teaching and the DIET they study in, is significant even at 0.01 level. From this finding it can be concluded that there is a clear cut association between the opinion of student-teachers' on their need of ICT in their classroom teaching and the DIET they

Table-4.3.5
Impact of Knowledge about ICT in Becoming a Better Teacher

Statement	Response	Aizawl		Lunglei		X ² Value, df, and Decision
		N	%	N	%	
5.Knowing how to use ICT will help me do well as a teacher	Disagree	2	2	6	6	df=2 X ² Value=1.87n.s. Ho-1 Accepted
	Neutral	17	18	17	18	
	Agree	73	80	74	76	
	Total	92	100	97	100	

n.s.=not significant; Required Chi-square Values with df=2 at 0.05=5.991 and 0.01=9.210

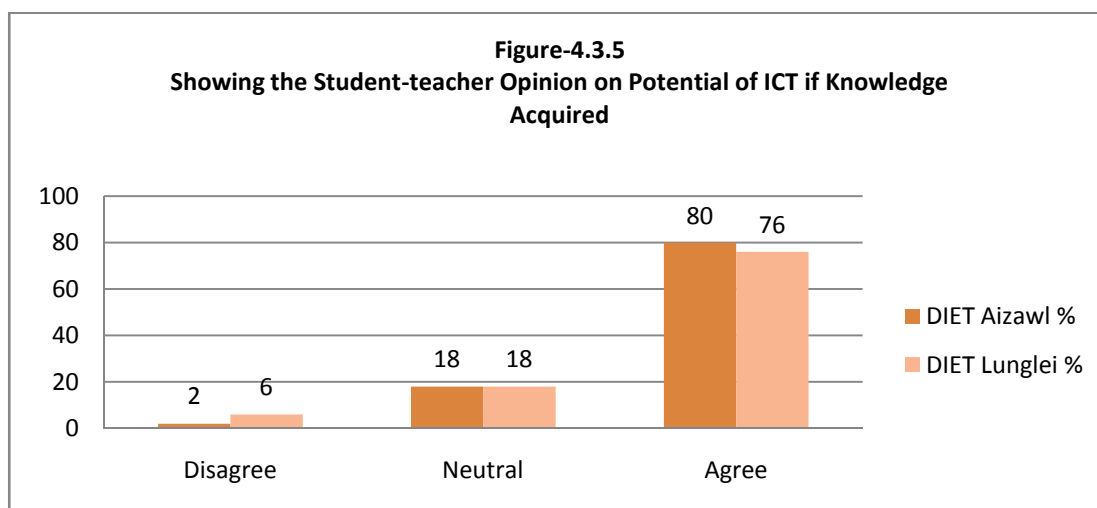
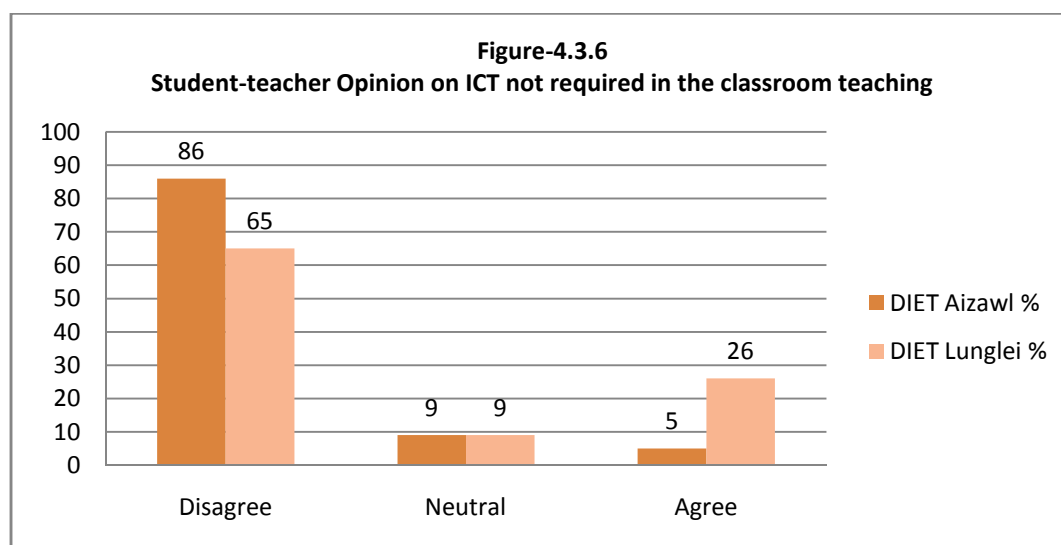


Table 4.3.6
Student-teachers Opinion on the Need of ICT in Classroom Teaching

Statement	Response	DIET Aizawl		DIET Lunglei		X ² Value, df, and Decision
		N	%	N	%	
6.I think I would never need ICT in my classroom teaching	Disagree	79	86	63	65	df=2 X ² Value=15.07** Ho-1 Rejected
	Neutral	8	9	9	9	
	Agree	5	5	25	26	
	Total	92	100	97	100	

***significant at 0.01 level; Required Chi-square Values with df=2 at 0.05=5.991 and 0.01=9.210*



study in. A close examination of data in various cells on this issue, vide Table 4.3.6, reveals that this association is because of the high variation in opinions of respondents from both DIETs. Thus, the null hypothesis (Ho-1) of independence or no association, in relation to the issue under reference, is rejected.

4.3.7 ICT has an Important Place in the Retaining of Information

By observing the Table No- 4.3.7, it is visible that relatively great size of the student-teachers i.e. 92% from DIET Aizawl and 90% from DIET Lunglei conceive that ICT occupies a great place in the retaining of information. 7% of the student-teachers in Aizawl and 8% in Lunglei are not sure on this issue. Only 1% of student-teachers in Aizawl and 2% of student-teachers in Lunglei do not consider ICT occupying a great place in retaining information.

The same table also shows that the chi-square value of 0.51, for association between student-teachers opinion on ICT holding a great place in retaining information and the DIET they study in, is insignificant even at 0.05 level. The observed result is very much close to the result to be expected on the hypothesis of independence. On the basis of this finding it can be concluded that there is no evidence of any real association between the opinion of student-teachers on this statement and the DIET they study in. A close examination of data in various cells on this issue, vide Table 4.3.7, reveals that the absence of this association is because of the little variation in opinions of respondents from both DIETs. Thus, the null hypothesis (Ho-1) of independence or no association, in relation to the issue under reference, is accepted.

4.3.8 ICT as a Waste of Time

Majority of the student-teachers i.e. 85% from DIET Aizawl and 74% from DIET Lunglei disagree with the statement (Table No- 4.3.8), they believe learning about ICT is not a waste of time. 10% of the student-teachers in Aizawl and 19% in Lunglei are not certain whether learning about ICT is a waste of time or not. In the case of DIET Aizawl 5% of the student-teacher opined that learning about ICT is a waste of time and 7% in Lunglei think the same.

The same table also shows that the chi-square value of 3.44, for association between student-teachers opinion on the statement that learning about ICT is a waste of time and the DIET they study in, is insignificant even at 0.05 level. The observed result is very much close to the result to be expected on the hypothesis of independence. On

Table-4.3.7
Student-teachers Opinion on ICT in Retaining Information

Statement	Response	DIET Aizawl		DIET Lunglei		X ² Value, df, and Decision
		N	%	N	%	
7. ICT occupies a great place in retaining information	Disagree	1	1	2	2	df=2 X ² Value=0.51n.s. Ho-1 Accepted
	Neutral	6	7	8	8	
	Agree	85	92	87	90	
	Total	92	100	97	100	

n.s=not significant; Required Chi-square Values with df=2 at 0.05=5.991 and 0.01=9.210

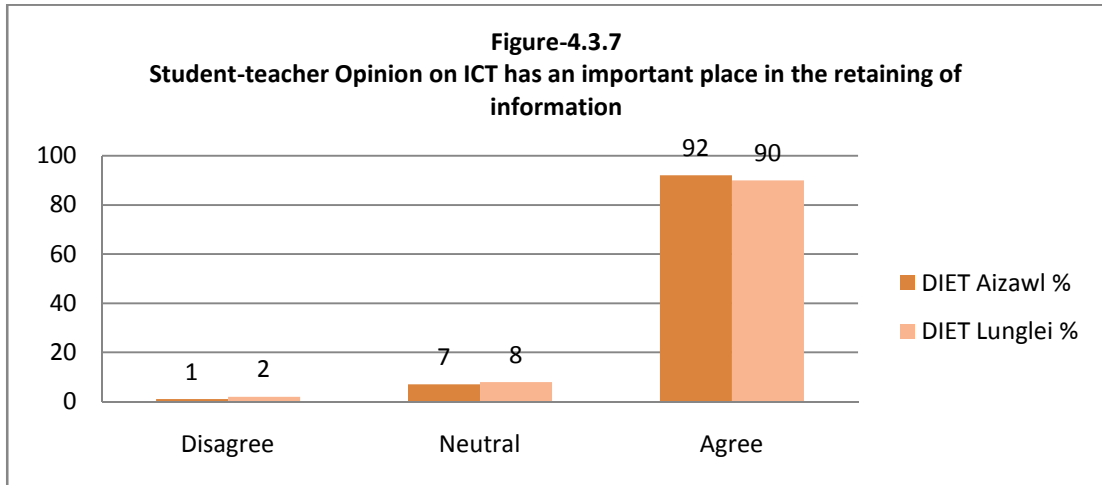
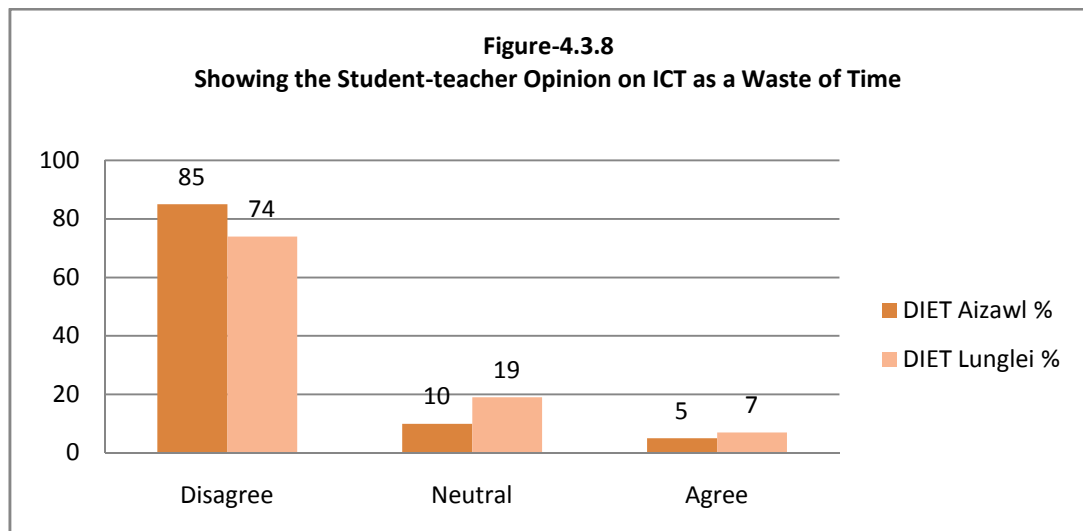


Table-4.3.8
Student-teachers Opinion on Learning of ICT as Wastage of Time

Statement	Response	DIET Aizawl		DIET Lunglei		X ² Value, df, and Decision
		N	%	N	%	
8. Learning about ICT is a waste of time	Disagree	78	85	72	74	df=2 X ² Value=3.44n.s. Ho-1 Accepted
	Neutral	9	10	18	19	
	Agree	5	5	7	7	
	Total	92	100	97	100	

n.s=not significant; Required Chi-square Values with df=2 at 0.05=5.991 and 0.01=9.210



the basis of this finding it can be concluded that there is no evidence of any real association between the opinion of student-teachers on this statement and the DIET they study in. A close examination of data in various cells on this issue, vide Table 4.3.8, reveals that the absence of this association is because of the little variation in opinions of respondents from both DIETs. Thus, the null hypothesis (Ho-1) of independence or no association, in relation to the issue under reference, is accepted.

4.3.9 ICT Helps in Saving Time and Efforts

As it can be observe from Table No- 4.3.9, majority of the student-teachers i.e. 70% in Aizawl and 70% in DIET Lunglei opined that ICT saves time and effort. While 27% of the student-teachers in Aizawl are not sure whether ICT saves time and effort or not, it can be seen that there are 3% of student-teacher who consider ICT as a waste of time and effort. In the case of DIET Lunglei 15% of the student-teachers do not think ICT saves time and effort and the remaining 15% of the student-teachers could not make a decision on whether ICT saves time and effort.

The same table also shows that the chi-square value of 10.44, for association between student-teachers on their opinion on the statement whether ICT saves their time and effort and the DIET they study in, is significant even at 0.01level. From this finding it can be concluded that there is a clear cut association between the opinion of student-teachers' on whether ICT saves their time and effort and the DIET they study in. A close examination of data in various cells on this issue, vide Table 4.3.9, reveals that this association is because of the high variation in opinions of respondents from both DIETs. Thus, the null hypothesis (Ho-1) of independence or no association, in relation to the issue under reference, is rejected

4.3.10 ICT will Supplement Classroom Teaching

A careful study of the Table No- 4.3.10, majority of the student-teachers i.e. 67% from DIET Aizawl and 56% from DIET Lunglei think that ICT will supplement their classroom teaching. 28% in Aizawl and 29% in Lunglei are not sure whether ICT will supplement their classroom teaching or not, it can also be seen that there are 5% of student-teachers in Aizawl and 15% in Lunglei do not think ICT will supplement their classroom teaching.

The same table also shows that the chi-square value of 5.37, for association between student-teachers opinion on the statement whether ICT supplementing their classroom

Table-4.3.9
Student-teachers Opinion on ICT in Saving Time and Effort

Statement	Response	DIET Aizawl		DIET Lunglei		X ² Value, df, and Decision
		N	%	N	%	
9. ICT saves time and efforts.	Disagree	3	3	15	15	df=2 X ² Value=10.44** Ho-1 Rejected
	Neutral	25	27	15	15	
	Agree	64	70	67	70	
	Total	92	100	97	100	

**=significant at .01 level; Required Chi-square Values with df=2 at 0.05=5.991 and 0.01=9.210

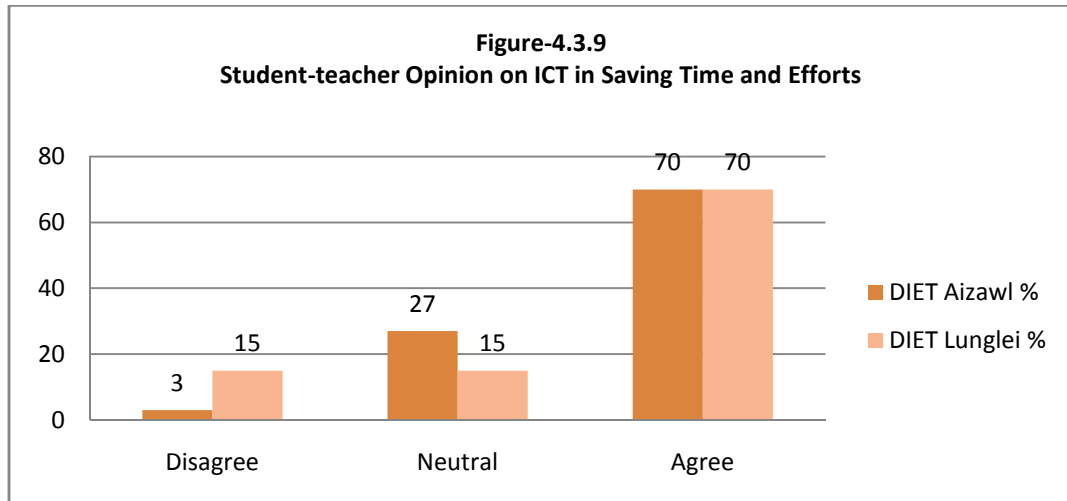
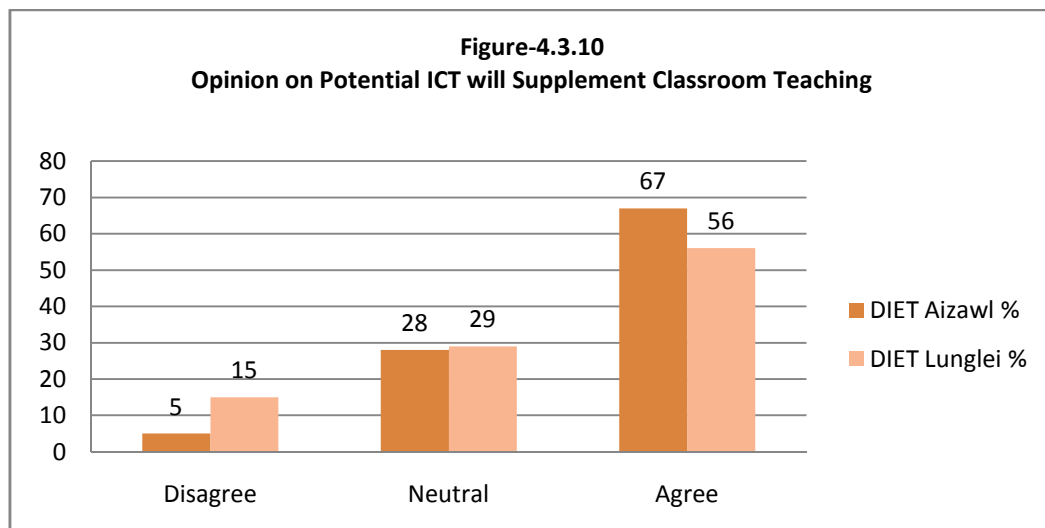


Table-4.3.10
Student-teachers Opinion on ICT as a Supplement in Classroom Teaching

Statement	Response	DIET Aizawl		DIET Lunglei		X ² Value, df, and Decision
		N	%	N	%	
10. ICT will supplement my classroom teaching	Disagree	5	5	15	15	df=2 X ² Value=5.37n.s Ho-1 Accepted
	Neutral	26	28	28	29	
	Agree	61	67	54	56	
	Total	92	100	97	100	

n.s.=not significant; Required Chi-square Values with df=2 at 0.05=5.991 and 0.01=9.210



teaching and the DIET they study in, is insignificant even at 0.05 level. The observed result is very much close to the result to be expected on the hypothesis of independence. On the basis of this finding it can be concluded that there is no evidence of any real association between the opinion of student-teachers on this statement and the DIET they study in. A close examination of data in various cells on this issue, vide Table 4.3.10, reveals that the absence of this association is because of the little variation in opinions of respondents from both DIETs. Thus, the null hypothesis (H_0-1) of independence or no association, in relation to the issue under reference, is accepted.

4.3.11. Prefer Doing Things Manually than with ICT

It is evident from Table No- 4.3.11, that only 23% of student-teachers from DIET Aizawl and 36% from DIET Lunglei prefer doing things using ICT rather than doing it by hand. Further, it is interesting to report that a considerably high percentage, i.e. 51% from DIET Aizawl and 33% from DIET Lunglei have remained neutral while responding to this issue, which may be due to the fact they could not take a very clear stand on it. Beside, 26% of respondents from DIET Aizawl and 31% from DIET Lunglei were of the opinion that they prefer doing things manually than using ICT. May be they find that there are certain areas where doing thing by ICT is more difficult than doing things manually, and this preference may vary from individual to individual depending on his/her strengths and weaknesses.

The same table also shows that the chi-square value of 6.88, for association between student-teachers opinion on this issue and the DIET they study in, is significant even at 0.01 level. The observed result is very much different from the result to be expected on the hypothesis of independence. From this finding it can be concluded that there is a clear cut association between the opinion of student-teachers' and the DIET they study in. A close examination of data in various cells on this issue, vide Table 4.3.11, reveals that this association is because of the high variation in opinions of respondents from both DIETs. Thus, the null hypothesis (H_0-1) of independence or no association, in relation to the issue under reference, is rejected.

4.3.12 ICT is Enjoyable

By observing Table No- 4.3.12, it can be seen that majority of the student-teachers i.e. 88% from DIET Aizawl and 85% from DIET Lunglei are on the opinion that using

Table-4.3.11
Student-teachers Opinion on Doing Things Manually than with ICT

Statement	Response	DIET Aizawl		DIET Lunglei		X ² Value, df, and Decision
		N	%	N	%	
11.I would rather do things by hand than with ICT	Disagree	21	23	35	36	df=2 X ² Value=6.88* Ho-1 Rejected
	Neutral	47	51	32	33	
	Agree	24	26	30	31	
	Total	92	100	97	100	

**=significant at .05 level; Required Chi-square Values with df=2 at 0.05=5.991 and 0.01=9.210*

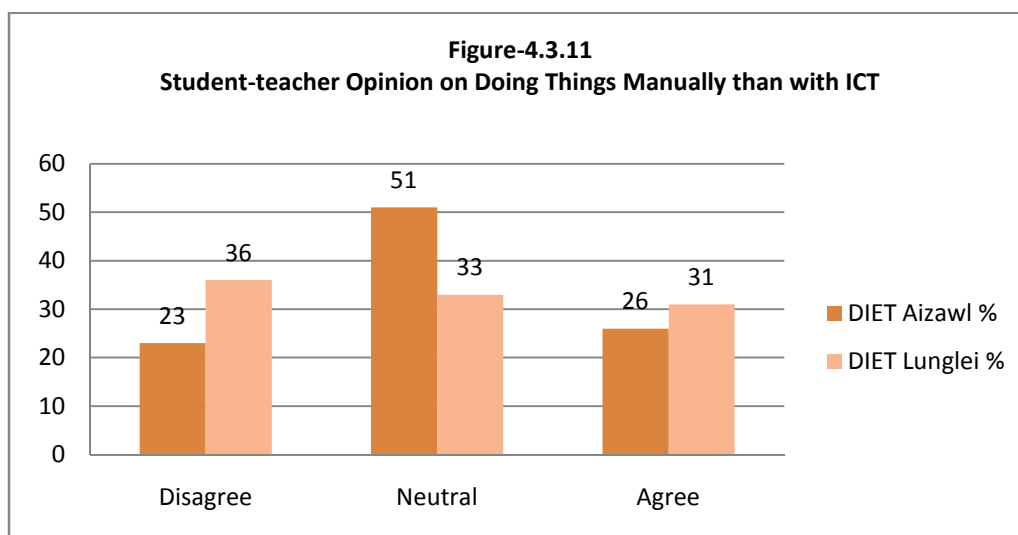
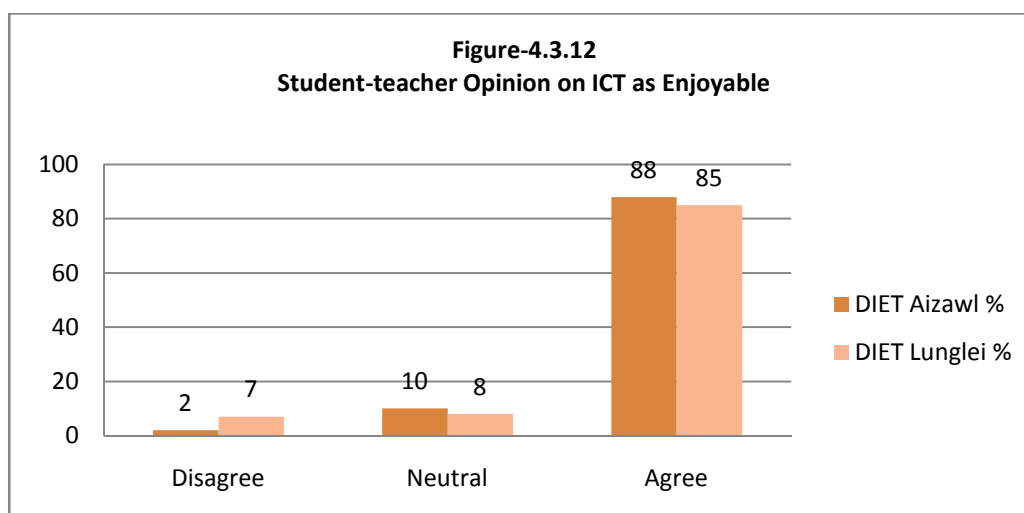


Table-4.3.12
Student-teachers Opinion on ICT as Enjoyable

Statement	Response	DIET Aizawl		DIET Lunglei		X ² Value, df, and Decision
		N	%	N	%	
12.Using ICT is enjoyable	Disagree	2	2	7	7	df=2 X ² Value=2.71n.s. Ho-1 Accepted
	Neutral	9	10	8	8	
	Agree	81	88	82	85	
	Total	92	100	97	100	

n.s.= not significant; Required Chi-square Values with df=2 at 0.05=5.991 and 0.01=9.210



ICT is enjoyable. 8% of the student-teachers in Lunglei are not sure whether they find ICT enjoyable not, and so does 10% of student-teachers in Aizawl. It can also be seen that there are 2% in Aizawl and 7% in Lunglei who do not enjoy using ICT.

The same table also shows that the chi-square value of 2.71 for association between student-teachers opinion on the issue under reference, and the DIET they study in, is insignificant even at 0.05 level. The observed result is very much close to the result to be expected on the hypothesis of independence. From this finding it can be concluded that there is no evidence of any real association between the opinion of student-teachers on this issue, and the DIET they study in. A close examination of data in various cells on this issue, vide Table 4.3.12, reveals that the absence of this association is because of the little variation in opinions of respondents from both DIETs. Thus, the null hypothesis (H_0-1) of independence or no association, in relation to this statement, is accepted.

4.3.13 Avoidance of ICT

ICT is becoming inevitable in our day today life. Whether you like it or not, you cannot avoid it. When student-teachers were asked a similar question, it is pleasing to report that a large majority i.e. 87% from DIET Aizawl and 54% from DIET Lunglei opined that they would not avoid the use of ICT. At the time only 3% of the student-teachers from DIET Aizawl, and 27% from DIET Lunglei reported that they would avoid the use of ICT as much as possible. Further, 19 percent of the student-teachers from DIET Lunglei, and 10 percent from DIET Aizawl remained neutral on this issue as they were not sure whether they would be able to avoid the use of ICT in their teaching learning processes as well as in administration.

The same table also shows that the chi-square value of 26.60., for association between opinion of student-teachers on the statement whether they can avoid ICT and the DIET they study in, is significant even at 0.01 level. The observed result is very much different from the result to be expected on the hypothesis of independence. From this finding it can be concluded that there is a clear cut association between the opinion of student-teachers' and the DIET they study in. A close examination of data in various cells on this issue, vide Table 4.3.13, reveals that this association is because of the high variation in opinions of respondents from both DIETs. Thus, the null hypothesis (H_0-1) of independence or no association, in relation to the issue under reference, is rejected.

Table-4.3.13
Student-teachers Opinion on their Avoidance of ICT

Statement	Response	DIET Aizawl		DIET Lunglei		X ² Value, df, and Decision
		N	%	N	%	
13.I would avoid ICT as much as possible	Disagree	80	87	53	54	Df=2 X ² Value=26.60** Ho-1 Rejected
	Neutral	9	10	18	19	
	Agree	3	3	26	27	
	Total	92	100	97	100	

**=significant at 0.01 level; Required Chi-square Values with df=2 at 0.05=5.991 and 0.01=9.210

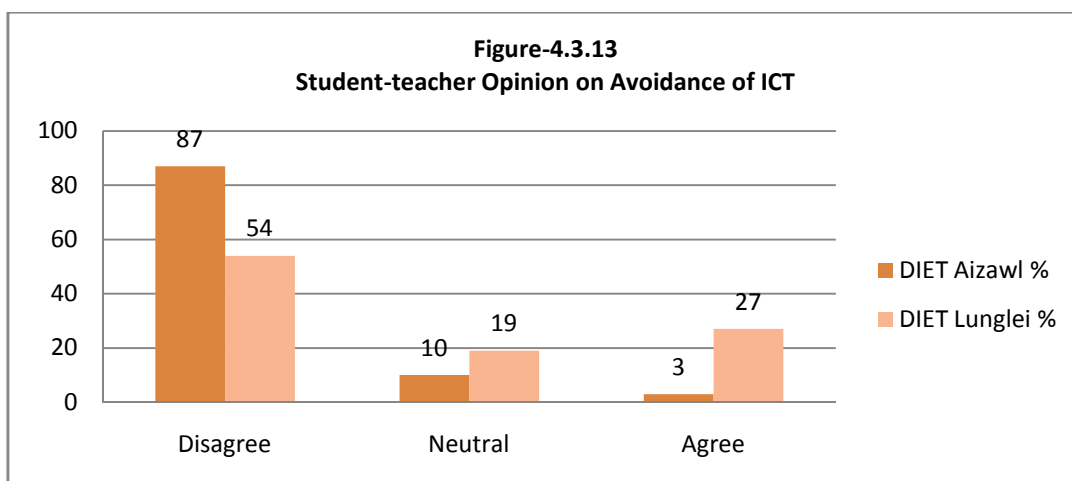
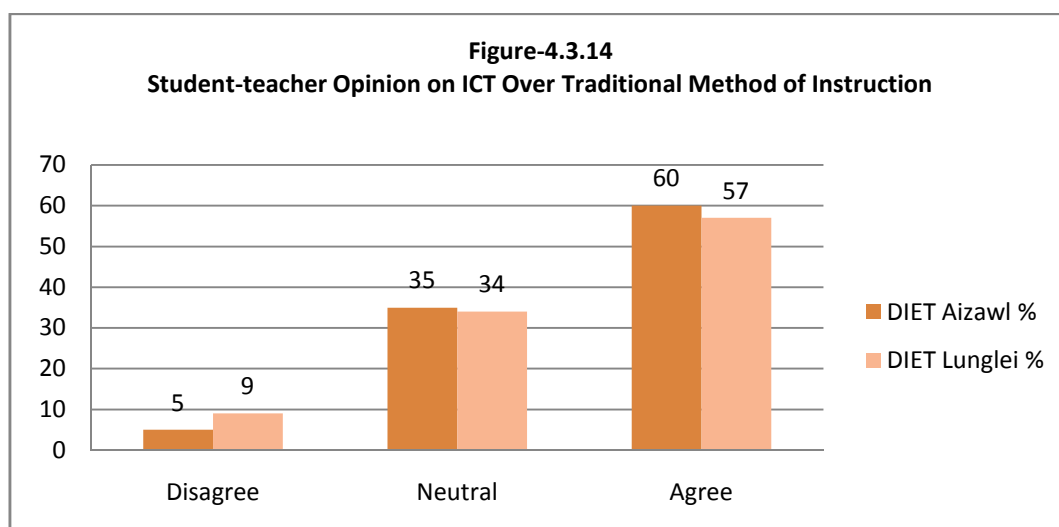


Table-4.3.14
Student-teachers Opinion on Advantage of ICT over Traditional Method of Instruction

Statement	Response	DIET Aizawl		Lunglei DIET		X ² Value, df, and Decision
		N	%	N	%	
14.Teaching with ICT offers advantage over traditional methods	Disagree	5	5	9	9	Df=2 X ² Value=1.02n.s. Ho-1 Accepted
	Neutral	32	35	33	34	
	Agree	55	60	55	57	
	Total	92	100	97	100	

n.s= not significant; Required Chi-square Values with df=2 at 0.05=5.991 and 0.01=9.210



4.3.14 Advantage of ICT Over Traditional Method of Instruction

From studying Table No- 4.3.14, it is evident that majority of the student-teachers i.e. 60% from DIET Aizawl and 57% from DIET Lunglei found that teaching with ICT offers real advantage over traditional methods of instruction. While 34% of the student-teachers in Lunglei are not sure whether ICT has more advantage than traditional method of instruction, it can be seen that there are only 9% of the student-teacher who does not think ICT has more advantage than traditional method of instruction. In the case of DIET Aizawl 5% of the student-teacher do not find ICT as having more advantage than traditional method of teaching and 35% of the student-teachers could not make a decision on whether ICT has more advantage than traditional method of instruction.

The same table also shows that the chi-square value of 1.02 for association between the opinion of student-teachers on the statement whether ICT has advantage over traditional method of teaching and the DIET they study in, is insignificant even at .05 level. The observed result is very much close to the result to be expected on the hypothesis of independence. On the basis of this finding it can be concluded that there is no evidence of any real association between the opinion of student-teachers on this statement and the DIET they study in. A close examination of data in various cells on this issue, vide Table 4.3.14, reveals that the absence of this association is because of the little variation in opinions of respondents from both DIETs. Thus, the null hypothesis (H_0-1) of independence or no association, in relation to this statement, is accepted.

4.3.15 Discomfort in discussing ICT with others

As it can be seen from Table No- 4.3.15, majority of the student-teachers i.e. 70% from DIET Aizawl and 57% from DIET Lunglei feel comfortable talking with others about ICT. 29% of the student-teachers in Lunglei are not sure whether they feel comfortable talking with others about ICT or not, it can be seen that 14% of the student-teacher do not feel comfortable talking with others about ICT. In the case of DIET Aizawl 14% of the student-teacher do not feel comfortable talking with others about ICT and 16% of the student-teachers could not make a decision on whether they feel comfortable or not.

The same table also shows that the chi-square value of 4.51, for association between the opinion of student-teachers on the statement whether they feel comfortable in talking about ICT with others and the DIET they study in, is insignificant even at 0.05 level. The observed result is very much close to the result to be expected on the hypothesis of independence. On the basis of this finding it can be concluded that there is no evidence of any real association between the opinion of student-teachers on this statement and the DIET they study in. A close examination of data in various cells on this issue, vide Table 4.3.15, reveals that the absence of this association is because of the little variation in opinions of respondents from both DIETs. Thus, the null hypothesis (Ho-1) of independence or no association, in relation to this statement, is accepted.

4.3.16 ICT Fits Well in the Goals of Teaching.

As Table-4.3.16 reveals, majority of the student-teachers i.e. 55% from DIET Aizawl and 62% from DIET Lunglei found ICT fitting well into their teaching goal. While 30% of the student-teachers in Lunglei are not sure whether they find ICT fits well into their teaching goal or not, it can be seen that only 8% of the student-teacher do not find ICT fitting well into their teaching goal. In the case of DIET Aizawl, 8% of the student-teacher do not find ICT fitting well into their teaching goal and 37% of the student-teachers could not make a decision on whether they find ICT fits well into their teaching goal or not.

The same table also shows that the chi-square value of 1.06, for association between the opinion of student-teachers on the statement whether ICT fits well into the goals of teaching and the DIET they study in, is insignificant even at 0.05 level. The observed result is very much close to the result to be expected on the hypothesis of independence. On the basis of this finding it can be concluded that there is no evidence of any real association between the opinion of student-teachers on this statement and the DIET they study in..A close examination of data in various cells on this issue, vide Table 4.3.16, reveals that the absence of this association is because of the little variation in opinions of respondents from both DIETs. Thus, the null hypothesis (Ho-1) of independence or no association, in relation to this statement, is accepted.

Table-4.3.15

Student-teachers Opinion on their Discomfort in Discussing ICT with Others

Statement	Response	DIET Aizawl		DIET Lunglei		X ² Value, df, and Decision
		N	%	N	%	
15. I don't feel comfortable talking about ICT with others	Disagree	64	70	55	57	df=2 X ² Value=4.51n.s. Ho-1 Accepted
	Neutral	15	16	28	29	
	Agree	13	14	14	14	
	Total	92	100	97	100	

n.s= not significant; Required Chi-square Values with df=2 at 0.05=5.991 and 0.01=9.210

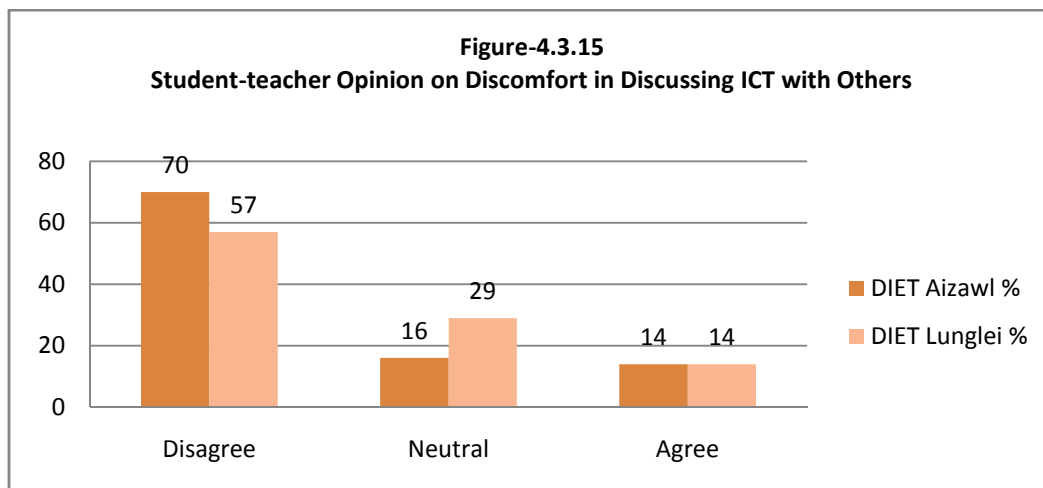
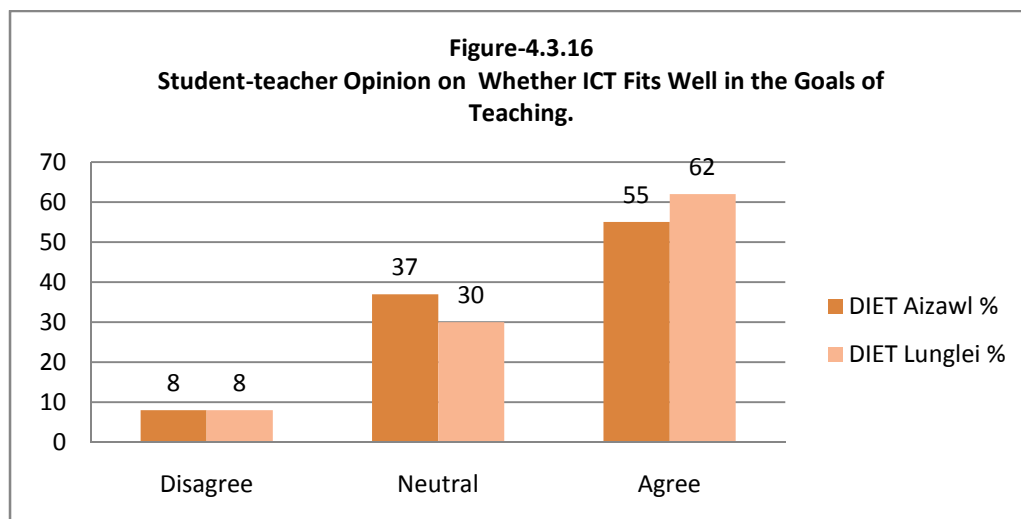


Table-4.3.16

Student-teachers Opinion on Whether ICT Fits well into the Goals of Teaching

Statement	Response	DIET Aizawl		DIET Lunglei		X ² Value, df, and Decision
		N	%	N	%	
16. ICT fits well into my goals of teaching	Disagree	7	8	8	8	df=2 X ² Value=1.06n.s. Ho-1 Accepted
	Neutral	34	37	29	30	
	Agree	51	55	60	62	
	Total	92	100	97	100	

n.s=not significant; Required Chi-square Values with df=2 at 0.05=5.991 and 0.01=9.210



4.3.17 ICT can Improve the Quality of Student's Learning

Observing Table No- 4.3.17, majority of the student-teachers i.e. 94% from DIET Aizawl and 75% from DIET Lunglei believe that ICT can improve the quality of students' learning. While 9% of the student-teachers in Lunglei are not sure whether ICT can improve the quality of students' learning or not, it can be seen that 16% of the student-teacher believe ICT cannot improve the quality of students' learning. In the case of DIET Aizawl 3% of the student-teacher believe ICT cannot improve the quality of students' learning and another 3% of the student-teachers could not make a decision on whether they think ICT can improve the quality of students' learning.

The same table also shows that the chi-square value of 11.93, for association between opinion of student-teachers on the statement whether ICT has any impact on students' learning and the DIET they study in, is significant even at 0.01 level. The observed result is very much different from the result to be expected on the hypothesis of independence. From this finding it can be concluded that there is a clear cut association between the opinion of student-teachers' and the DIET they study in. A close examination of data in various cells on this issue, vide Table 4.3.17, reveals that this association is because of the high variation in opinions of respondents from both DIETs. Thus, the null hypothesis (H_0-1) of independence or no association, in relation to the issue under reference, is rejected.

4.3.18 Improvement of Quality of Education by ICT

A careful study of Table No- 4.3.18 showed, majority of the student-teachers i.e. 86% from DIET Aizawl and 81% from DIET Lunglei believe that ICT will improve the quality of education. 12% of the student-teachers in Lunglei are not sure whether ICT will improve the quality of education or not, it can also be seen that there are 7% of student-teacher who do not think ICT will improve the quality of education. In the case of DIET Aizawl 4% of the student-teacher do not think ICT will improve the quality of education and 10% of the student-teachers could not make a decision on whether ICT will improve the quality of education.

The same table also shows that the chi-square value of 0.88, for association between the opinion of student-teachers on the statement whether ICT will improve the quality of education and the DIET they study in, is insignificant even at 0.05 level. The observed result is very much close to the result to be expected on the hypothesis of independence. On the basis of this finding it can be concluded that there is no

Table-4.3.17
Student-teachers Opinion on ICT can Improve the Quality of Student's Learning

Statement	Response	DIET Aizawl		DIET Lunglei		X ² Value, df, and Decision
		N	%	N	%	
17.ICT cannot improve the quality of students' learning	Disagree	86	94	73	75	df=2 X ² Value=11.93** Ho-1 Rejected
	Neutral	3	3	9	9	
	Agree	3	3	15	16	
	Total	92	100	97	100	

***=significant at .01 level; Required Chi-square Values with df=2 at 0.05=5.991 and 0.01=9.210*

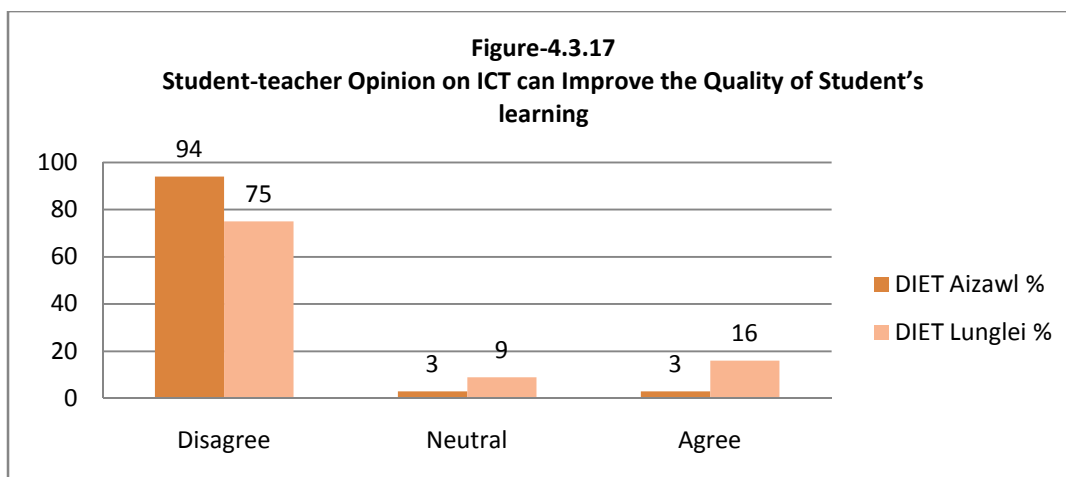
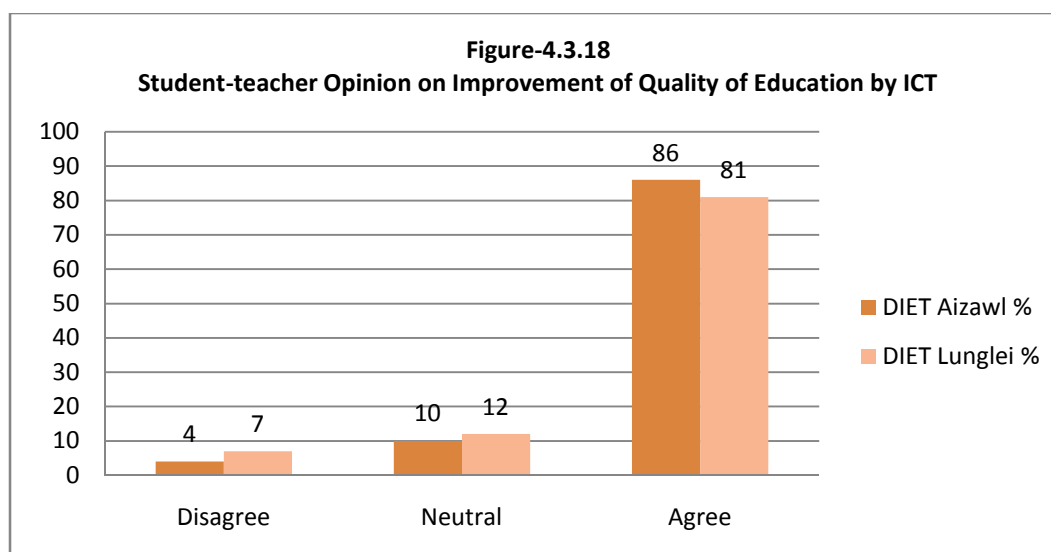


Table-4.3.18
Student-teachers Opinion on the Improvement of Quality of Education by ICT

Statement	Response	DIET Aizawl		DIET Lunglei		X ² Value, df, and Decision
		N	%	N	%	
18.ICT will improve the quality of education	Disagree	4	4	7	7	df=2 X ² Value=0.88n.s Ho-1 Accepted
	Neutral	9	10	11	12	
	Agree	79	86	79	81	
	Total	92	100	97	100	

n.s=not significant; Required Chi-square Values with df=2 at 0.05=5.991 and 0.01=9.21



evidence of any real association between the opinion of student-teachers on this statement and the DIET they study in. A close examination of data in various cells on this issue, vide Table 4.3.18, reveals that the absence of this association is because of the little variation in opinions of respondents from both DIETs. Thus, the null hypothesis (Ho-1) of independence or no association, in relation to this statement, is accepted.

4.3.19 No place for ICT in schools

Taking notice of Table No- 4.3.19, majority of the student-teachers i.e. 70% from DIET Aizawl and 77% from DIET Lunglei believe that ICT should have a place in schools. While 14% of the student-teachers in Lunglei are not sure whether ICT should have a place in school or not, it can be seen that 9% of the student-teachers who thinks ICT should have no place in school. In the case of DIET Aizawl 14% of the student-teachers thinks ICT should not have any place in school and 16% of the student-teachers could not make a decision on whether ICT should have a place in school or not.

The same table also shows that the chi-square value of 1.60 for association between the opinion of student-teachers on the statement that ICT does not have any place in schools and the DIET they study in, is insignificant even at .05 level. The observed result is very much close to the result to be expected on the hypothesis of independence. On the basis of this finding it can be concluded that there is no evidence of any real association between the opinion of student-teachers on this statement and the DIET they study in. A close examination of data in various cells on this issue, vide Table 4.3.19, reveals that the absence of this association is because of the little variation in opinions of respondents from both DIETs. Thus, the null hypothesis (Ho-1) of independence or no association, in relation to this statement, is accepted.

4.3.20 Limited class timing for ICT

As it can be seen from Table No- 4.3.20, a considerable amount of student-teachers i.e. 43% from DIET Aizawl and 40% from DIET Lunglei believe that class time is too limited or enough for using ICT. 27% of the student-teachers in Lunglei are not sure whether class time is too limited for using ICT, it can be seen that there are 33% of student-teachers who think that the duration of class is enough for using ICT. In the case of DIET Aizawl, 23% of the student-teacher think that class time is enough for

Table 4.3.19
Student-teachers Opinion on ICT has No Place in Schools

Statement	Response	DIET Aizawl		DIET Lunglei		X ² Value, df, and Decision
		N	%	N	%	
19. ICT should have no place in schools	Disagree	64	70	75	77	Df=2 X ² Value=1.60n.s Ho-1 Accepted
	Neutral	15	16	13	14	
	Agree	13	14	9	9	
	Total	92	100	97	100	

n.s=not significant; Required Chi-square Values with df=2 at 0.05=5.991 and 0.01=9.210

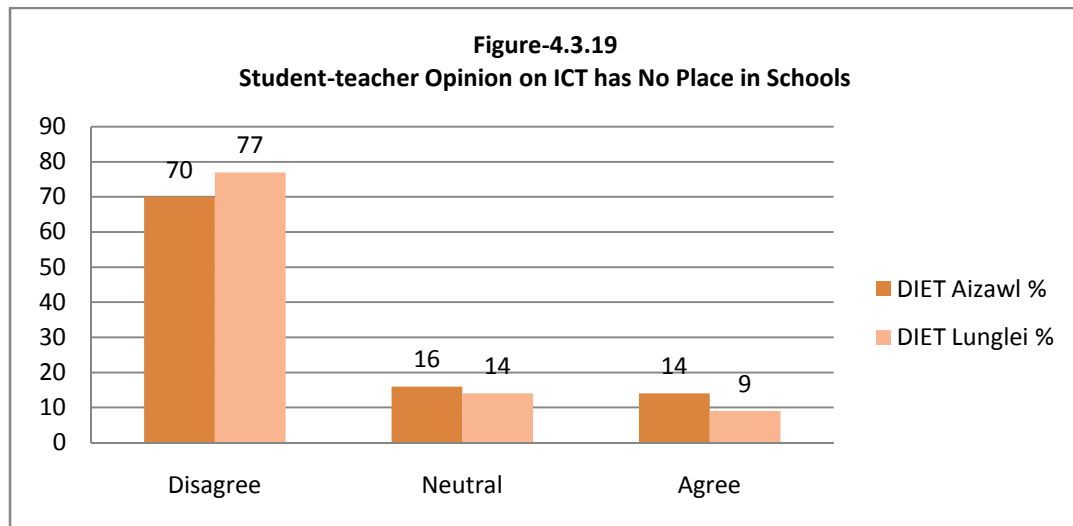
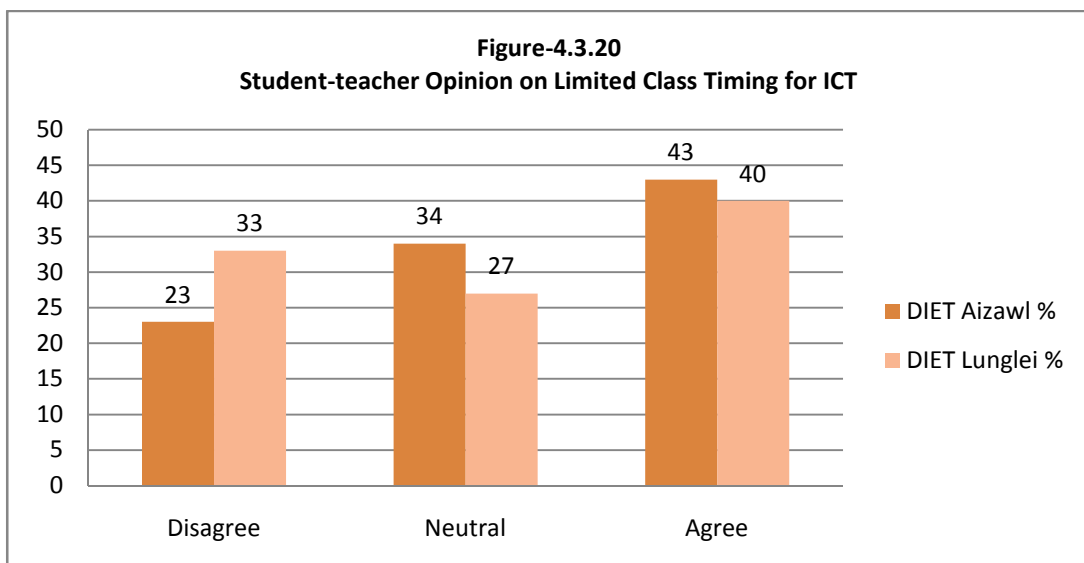


Table 4.3.20
Student-teachers Opinion on the Limitation of Class Time for the Use of ICT

Statement	Response	DIET Aizawl		DIET Lunglei		X ² Value, df, and Decision
		N	%	N	%	
20. Class time is too limited for using ICT	Disagree	21	23	32	33	Df=2 X ² Value=2.60n.s Ho-1 Accepted
	Neutral	31	34	26	27	
	Agree	40	43	39	40	
	Total	92	100	97	100	

n.s=not significant; Required Chi-square Values with df=2 at 0.05=5.991 and 0.01=9.210



using ICT and 34% of the student-teachers could not make a decision on whether class time is too limited or enough for using ICT.

The same table also shows that the chi-square value of 2.60 for association between the opinion of student-teachers on the statement whether class time is too limited for using ICT and the DIET they study in, is insignificant even at .05 level. The observed result is very much close to the result to be expected on the hypothesis of independence. On the basis of this finding it can be concluded that there is no evidence of any real association between the opinion of student-teachers on this statement and the DIET they study in. A close examination of data in various cells on this issue, vide Table 4.3.20, reveals that the absence of this association is because of the little variation in opinions of respondents from both DIETs. Thus, the null hypothesis (Ho-1) of independence or no association, in relation to this statement, is accepted.

SECTION-4

4.4 Level of Preparedness of Student Teachers in Using ICT

4.4.1 Ability to Open File in a Computer(document, movies, music, etc.)

As it can be seen from the above table, Table No- 4.4.1, majority of the student-teachers i.e. 96% from DIET Aizawl and 98% from DIET Lunglei can open a file. However, 4% of the student-teachers in Aizawl and 2% of the student-teachers in Lunglei cannot do so.

The same table further shows that the t-value of 0.81, being less than the required value with $df=187$, is not significant even at 0.05 level. On the basis of this finding it can be concluded that there is no significant difference between the student-teachers of both DIETs with regard to their ability to open a file in computer. Hence, the null hypothesis (Ho-2), in relation to the student-teachers' ability to open file in a computer, is accepted.

4.4.2 Ability to Create/Edit and Save a Document in Computer.

A perusal of data vide Table No- 4.4.2, shows that a large majority of the student-teachers i.e. 92% from DIET Aizawl and 87% from DIET Lunglei can create/edit and save a document, whereas, 8% of them in Aizawl DIET and 13% in DIET Lunglei cannot do so.

Table-4.4.1
Student-teachers' Ability to Open a File in a Computer

Statement	Response	Aizawl DIET		Lunglei DIET		t-value (t-test for percentages)
		N	%	N	%	
1. Open a file in a computer (document, movies, music, etc.)	Yes	88	96	95	98	df=187 t-value=0.81 n.s. Ho-2 Accepted
	No	4	4	2	2	
	Total	92	100	97	100	

n.s.= Not Significant; Required 't-value' with df=187 at 0.05 =1.97, and at 0.01 =2.58

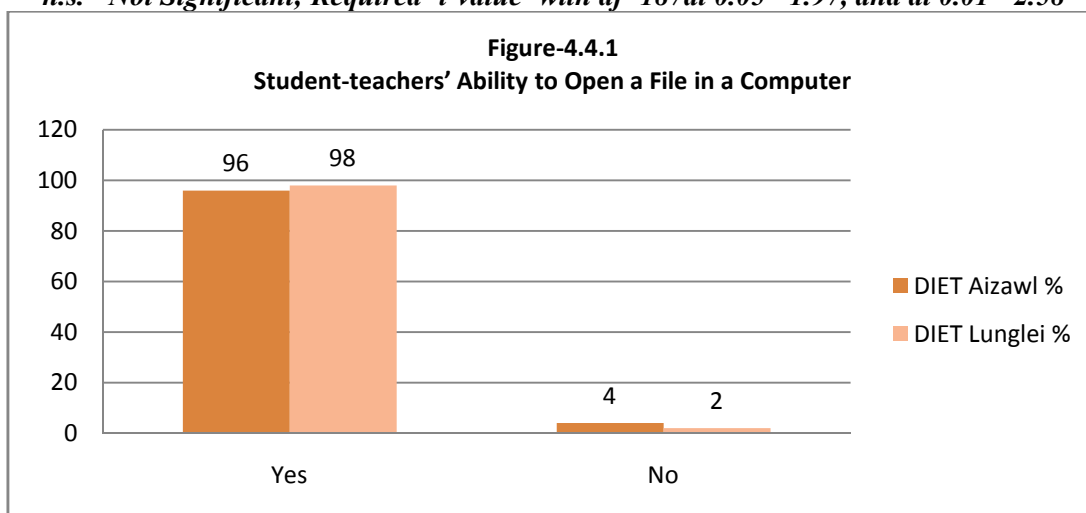
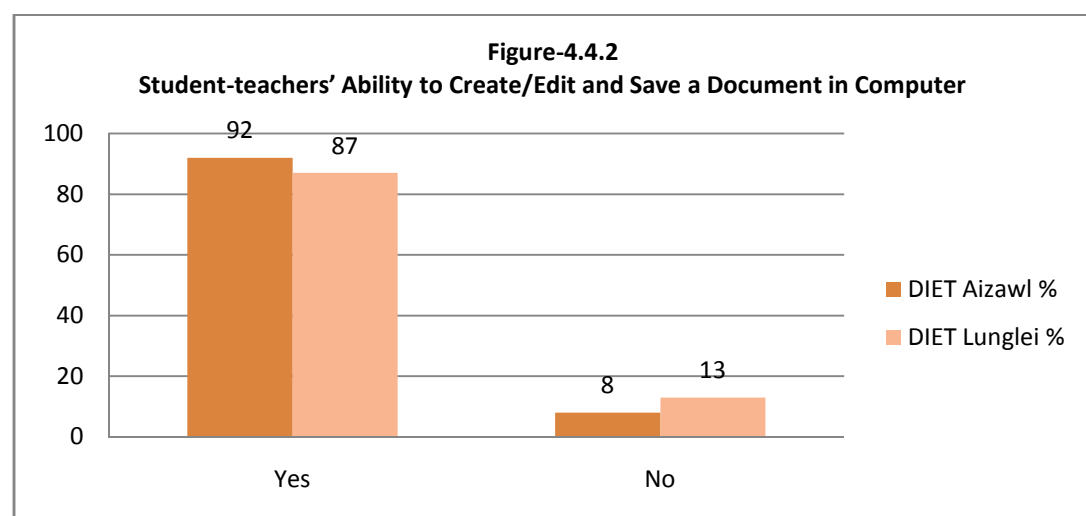


Table-4.4.2
Student-teachers' Ability to Create/Edit and Save a Document in Computer

Statement	Response	DIET Aizawl		DIET Lunglei		t-value (t-test for percentage)
		N	%	N	%	
2. Create/edit and save a document.	Yes	85	92	84	87	df=187 t-value=1.12 n.s. Ho-2 Accepted
	No	7	8	13	13	
	Total	92	100	97	100	

n.s.= Not Significant; Required 't-value' with df=187 at 0.05 =1.97, and at 0.01 =2.58



The same table further shows that the t-value of 1.12, being less than the required value with $df=187$, is not significant even at 0.05 level. On the basis of this finding it can be concluded that there is no significant difference between the student-teachers of both DIETs in relation to their ability to create/edit and save a document. Hence, the null hypothesis (H_0-2), in relation to the student-teachers' ability to create/edit and save a document in computer, is accepted.

4.4.3 Ability to Copy or Move Files to and from CD, Pen-drive, Hard-disk, etc.

A large majority of student-teachers i.e. 91% from DIET Aizawl and 86% from DIET Lunglei, as shown in Table No- 4.4.3, reported that they can copy files to and from CD, pen drive, hard disk, etc. However, 9% of the student-teachers in DIET Aizawl and 14% of the student-teachers in DIET Lunglei reported it otherwise

The same table further shows that the t-value of 1.08, being less than the required value with $df=187$, is not significant even at 0.05 level. On the basis of this finding it can be concluded that there is no significant difference between the student-teachers both DIETs on their ability to copy files to and from CD, pen drive, hard disk, etc. Hence, the null hypothesis (H_0-2), in relation to the student-teachers' ability to copy or move files to and from CD, pendrive, hard disk, etc. is accepted.

4.4.4 Ability to Delete a File

A quick glance at data vide Table No- 4.4.4 shows that a high majority of the student-teachers i.e. 96% from DIET Aizawl and 97% from DIET Lunglei can delete a file, whereas the rest 4% of them from DIET Aizawl and 3% DIET Lunglei cannot delete a file.

The same table further shows that the t-value of 0.37 in relation to the comparison of the student-teachers of both DIETs on their ability to delete a file, being less than the required value with $df=187$, is not significant even at 0.05 level. On the basis of this finding it can be concluded that there is no significant difference between the student-teachers of the two DIETs in relation to their ability to delete files from computer. Hence, the null hypothesis (H_0-2), in relation to the student-teachers' ability to delete a file, is accepted.

4.4.5 Ability To Print Documents, Pictures, Graphs, Etc.

As it can be seen from Table No- 4.4.5, majority of the student-teachers i.e. 64% from DIET Aizawl and 67% from DIET Lunglei can print documents, pictures, graphs,

Table-4.4.3
Student-teachers' Ability to Copy or Move Files to and from CD, Pen-drive, Hard-disk, etc.

Statement	Response	DIET Aizawl		DIET Lunglei		t- value (t-test for percentage)
		N	%	N	%	
3.Copy/move files To and from CD, pen-drive, hard-disk, etc.	Yes	84	91	83	86	df=187 t-value=1.08 n.s. Ho-2 Accepted
	No	8	9	14	14	
	Total	92	100	97	100	

n.s.= Not Significant; Required 't-value' with df=187at 0.05 =1.97, and at 0.01 =2.58

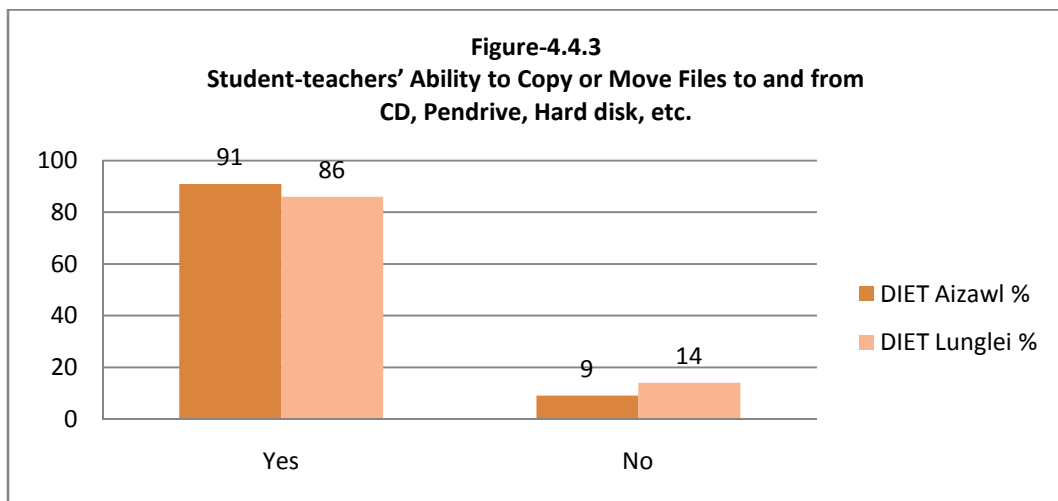
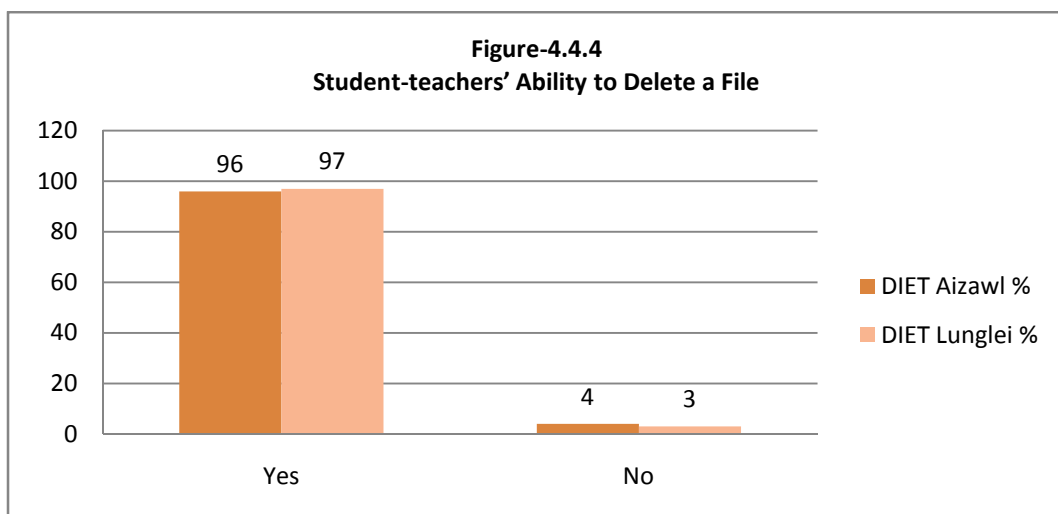


Table-4.4.4
Student-teachers' Ability to Delete a File

Statement	Responses	DIET Aizawl		Lunglei DIET		t- value (t-test for percentage)
		N	%	N	%	
4.Delete a file	Yes	88	96	94	97	df=187 t-value=0.37 n.s. Ho-2 Accepted
	No	4	4	3	3	
	Total	92	100	97	100	

n.s.= Not Significant; Required 't-value' with df=187at 0.05 =1.97, and at 0.01 =2.58



etc., whereas the rest of 36% of the student-teachers in Aizawl, and 33% of the student- in Lunglei cannot do so.

The same table further shows that the t-value of 0.43, being less than the required value with $df=187$, is not significant even at 0.05 level. On the basis of this finding it can be concluded that there is no significant difference between the student-teachers of the both DIETs with regard to their ability to print documents, pictures, graphs, etc. Hence, the null hypothesis (H_0-2), in relation to the student-teachers' ability to print documents, pictures, graphs, etc., is accepted.

4.4.6 Ability to Browse the Internet to Look Up Information for Studies

It can be seen from the Table No- 4.4.6 that majority of the student-teachers i.e. 76% from DIET Aizawl and 90% from DIET Lunglei can browse the internet to look up information for their studies, whereas the remaining 24% of the student-teachers in Aizawl and 10% in Lunglei do not know how to browse internet.

The same table further shows that the t-value of 2.12 in relation to the comparison of student-teachers of both DIETs on their ability to browse internet is significant at 0.05 level. On the basis of this finding it can be concluded that there is a significant difference between student-teachers of two DIETs. A comparative analysis of percentages vide the table reveals that this difference is in favor of DIET Lunglei, as the percentage of its student-teachers, who can browse internet, is higher than their counterparts from DIET Aizawl. Thus, the null hypothesis (H_0-2), in relation to this ability, is rejected.

4.4.7 Ability to Copy and Download Files from the Internet

As it can be seen from Table No- 4.4.7, majority of the student-teachers i.e. 77% from DIET Aizawl and 89% from DIET Lunglei can copy and download files from the internet, whereas, 23% of the student-teachers in Aizawl and 11% in Lunglei cannot do so.

The same table further shows that the t-value of 2.27 in relation to the comparison of student-teachers of both DIETs is significant at 0.05 level. On the basis of this finding it can be concluded that there is a significant difference between student-teachers of two DIETs. A quick glance at data in the table reveals that this difference is in favor of DIET Lunglei, as the percentage of its student-teachers, who can copy and

Table-4.4.5
Student-teachers' Ability to Print Documents, Pictures, Graphs, etc.

Statement	Responses	DIET Aizawl		DIET Lunglei		t- value (t-test for percentage) df=187 t-value=0.43 n.s. Ho-2 Accepted
		N	%	N	%	
5.Print documents, pictures, graphs, etc.	Yes	59	64	65	67	
	No	33	36	32	33	
	Total	92	100	97	100	

n.s.= Not Significant; Required 't-value' with df=187 at 0.05 =1.97, and at 0.01 =2.58

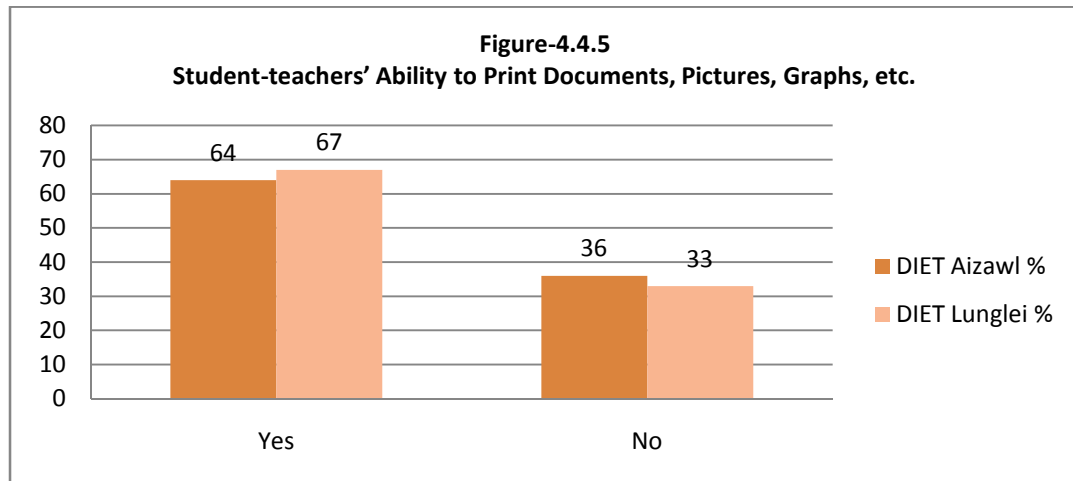
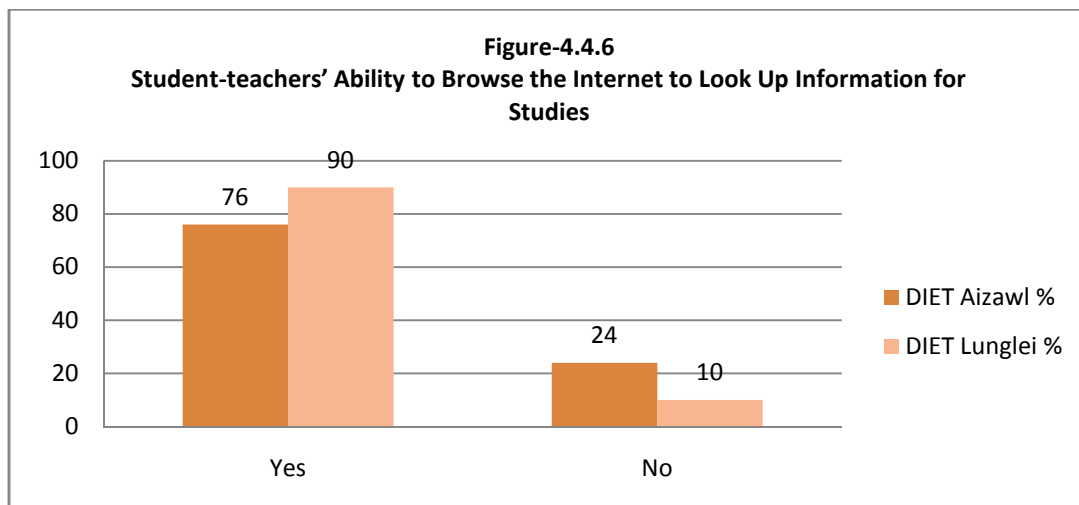


Table-4.4.6
Student-teachers' Ability to Browse the Internet to Look up Information for Studies

Statement	Response	Aizawl DIET		DIET Lunglei		t- value (t-test for percentage) df=187 t-value=2.12* Ho-2 Rejected
		N	%	N	%	
6. Browse the internet to look up information for studies.	Yes	70	76	87	90	
	No	22	24	10	10	
	Total	92	100	97	100	

**Significant at 0.05 level; Required 't-value' with df=187 at 0.05 =1.97, and at 0.01 =2.58*



download files, is higher than their counterparts from DIET Aizawl. Thus, the null hypothesis (Ho-2), in relation to this ability, is rejected.

4.4.8 Ability to Create a PowerPoint Presentation

An examination of data vide Table No- 4.4.8, shows that only 46% of the student-teachers in DIET Aizawl and 32% in DIET Lunglei can prepare a Power Point Presentation, whereas, the remaining 54% of them from DIET Aizawl and 68% from DIET Lunglei are unable to do so.

The same table further shows that the t-value of 1.98 in relation to the comparison of the student-teachers of both DIETs on their ability to create a powerpoint presentation is significant at 0.05 level. On the basis of this finding it can be concluded that there is a significant difference between the student-teachers of the two DIETs with regard to their ability to prepare a Power Point Presentation. A quick glance at data in the table reveals that this difference is in favor of DIET Aizawl, as the percentage of its student-teachers, who can create a powerpoint presentation, is higher than their counterparts from DIET Aizawl. Hence, the null hypothesis (Ho-2), in relation to the student-teachers' ability to create a PowerPoint presentation, is rejected.

4.4.9 Ability to Create a Multimedia Presentation

An analysis of data vide Table No- 4.4.9 reveals that only 36% of the student-teachers in DIET Aizawl and 24% in DIET Lunglei reported that they can create a multimedia presentation, whereas, the rest 64% from DIET Aizawl and 76% from DIET Lunglei opined that they cannot do so.

The same table further shows that the t-value of 1.81 in relation to the comparison of the student-teachers of both DIETs on their ability to create a multimedia presentation, being less than the required value with $df=187$, is not significant even at 0.05 level. On the basis of this finding it can be concluded that there is no significant difference between the responses of the two DIETs with regard to their ability to create a multimedia presentation. Hence, the null hypothesis (Ho-2), in relation to the student-teachers' ability to create a multimedia presentation, is accepted.

4.4.10 Ability to Compose and Send Email

As it can be seen from the above table, Table No- 4.4.10, majority of the student-teachers i.e. 60% from DIET Aizawl and 51% from DIET Lunglei can compose and

Table-4.4.7
Student-teachers' Ability to Copy and Download Files from the Internet

Statement	Response	DIET Aizawl		DIET Lunglei		t- value (t-test for percentage) df=187 t-value=2.27* Ho-2 Rejected
		N	%	N	%	
7.Copy and download files from the internet	Yes	71	77	86	89	
	No	21	23	11	11	
	Total	92	100	97	10	

* Significant at 0.05 level; Required 't-value' with df=187at 0.05 =1.97, and at 0.01 =2.58

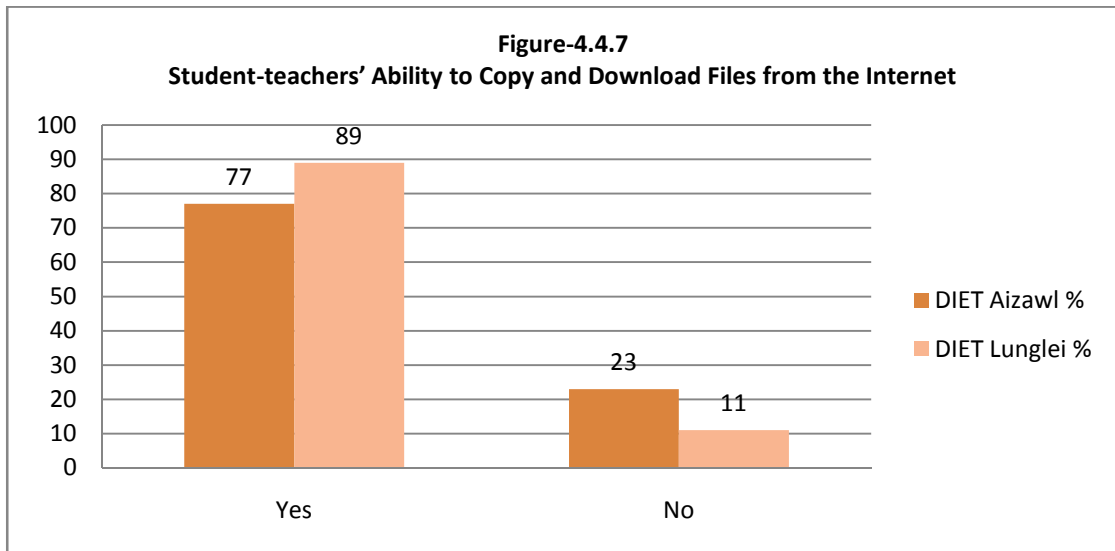


Table-4.4.8
Student-teachers' ability to Create a PowerPoint Presentation

Statement	Response	DIET Aizawl		DIET Lunglei		t-value (t-test for percentage) df=187 t-value=1.98* Ho-2 Rejected
		N	%	N	%	
8. Create a PowerPoint presentation	Yes	42	46	31	32	
	No	50	54	66	68	
	Total	92	100	97	100	

* Significant at 0.05 level; Required 't-value' with df=187at 0.05 =1.97, and at 0.01 =2.58

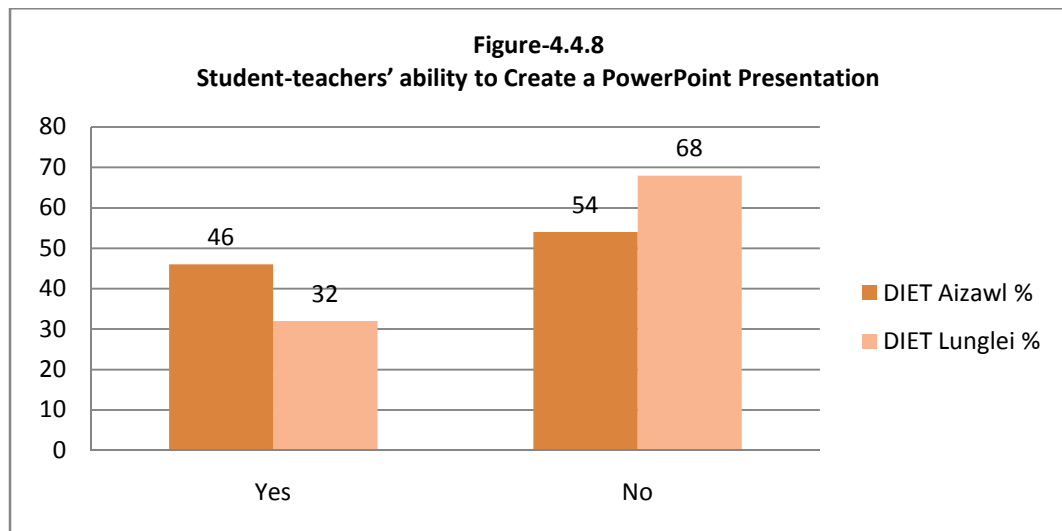


Table-4.4.9
Student-teachers' Ability to Create a Multimedia Presentation

Statement	Response	DIET Aizawl		DIET Lunglei		t- value (t-test for percentage)
		N	%	N	%	
9.Create a multimedia presentation	Yes	33	36	23	24	df=187 t-value=1.81 n.s. Ho-2 Accepted
	No	59	64	74	76	
	Total	92	100	97	100	

n.s.= Not Significant; Required 't-value' with df=187at 0.05 =1.97, and at 0.01 =2.58

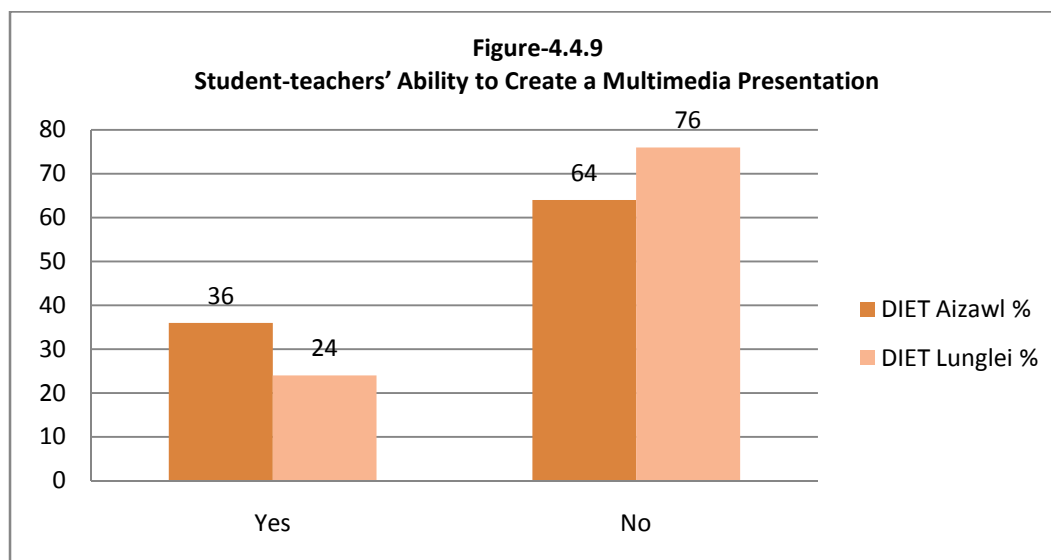
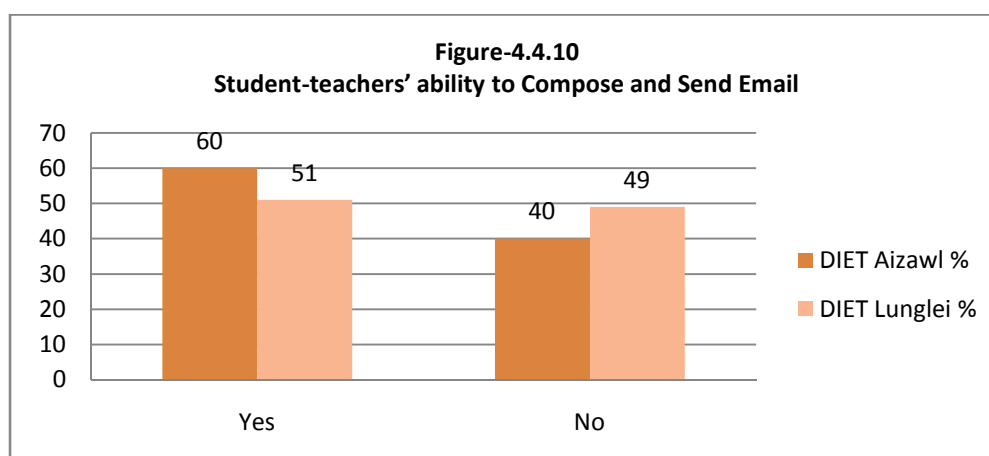


Table-4.4.10
Student-teachers' Ability to Compose and Send Email

Statement	Response	DIET Aizawl		DIET Lunglei		t- value (t-test for percentage)
		N	%	N	%	
10. Compose and send email	Yes	55	60	49	51	df=187 t-value=1.20 n.s. Ho-2 Accepted
	No	37	40	48	49	
	Total	92	100	97	100	

n.s.= Not Significant; Required 't-value' with df=187at 0.05 =1.97, and at 0.01 =2.58



send email. On the other hand 40% of the student-teachers in Aizawl and 49% in Lunglei cannot do so.

The same table further shows that the t-value of 1.20 in relation to the comparison of the student-teachers of both DIETs on their ability to compose and send email, being less than the required value with $df=187$, is not significant even at 0.05 level. On the basis of this finding it can be concluded that there is no significant difference between the student-teachers of the two DIETs with regard to their ability to compose and send email. Hence, the null hypothesis (H_0-2), in relation to the student-teachers' ability to compose and send email, is accepted.

4.4.11 Ability to Install New Software on a Computer

As it can be seen from Table No- 4.4.11, majority of the student-teachers i.e. 58% from DIET Aizawl and 62% from DIET Lunglei can install new software in computer, whereas, the rest 42% of the student-teachers in Aizawl and 38% of the student-teachers in Lunglei have not yet learned to install new software.

The same table further shows that the t-value of 0.56 in relation to the comparison of the student-teachers of both DIETs on their ability to install new software on a computer, being less than the required value with $df=187$, is not significant even at 0.05 level. On the basis of this finding it can be concluded that there is no significant difference between the student-teachers of the two DIETs in relation to their ability to install new software in computer. Hence, the null hypothesis (H_0-2), in relation to the student-teachers' ability to install new software on a computer, is accepted.

4.4.12 Ability to Operate Word Processing Programme (MS Word)

From the Table No- 4.4.12, it is visible that majority of the student-teachers from DIET Aizawl i.e. 72% and from DIET Lunglei i.e. 56% can operate a word processing programme, while the remaining 28% from Aizawl and 44% from Lunglei are unable to operate the programme

The same table further shows that the t-value of 3.45 in relation to the comparison of the student-teachers of both DIETs on their ability to operate word processing programme, is significant even at 0.01 level. Accordingly it can be concluded that there is a significant difference between the student-teachers of the two DIETs, and a closer look at data in the table reveals that this difference is in favor of DIET Aizawl, as the percentage of its student-teachers, who can operate word processing

Table-4.4.11
Student-teachers' Ability to Install New Software on a Computer

Statement	Response	DIET Aizawl		DIET Lunglei		t- value (t-test for percentage)
		N	%	N	%	
11. Install new software on a computer	Yes	53	58	60	62	df=187 t- value=0.56 n.s. Ho-2 Accepted
	No	39	42	37	38	
	Total	92	100	97	100	

n.s.= Not Significant; Required 't-value' with df=187 at 0.05 =1.97, and at 0.01 =2.58

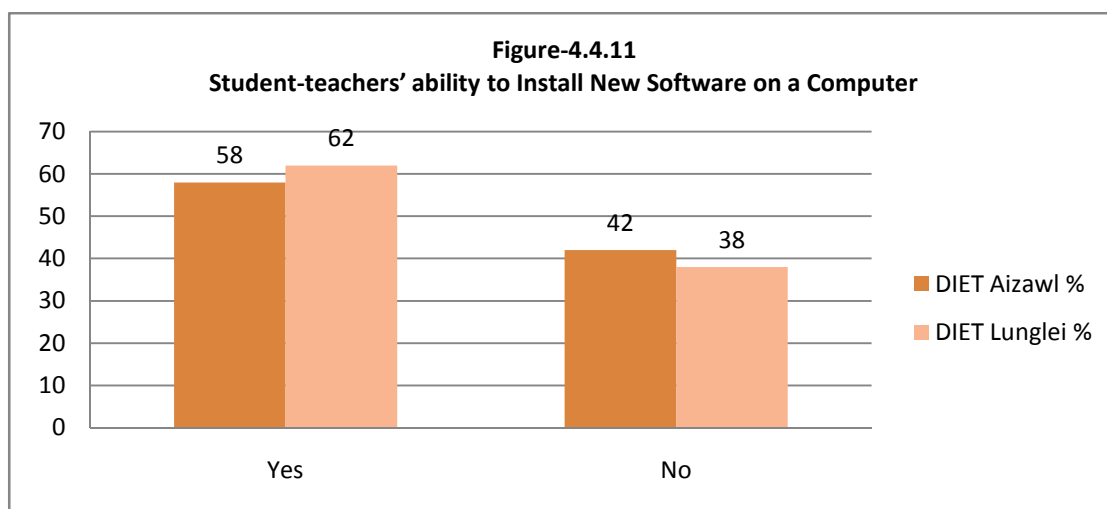
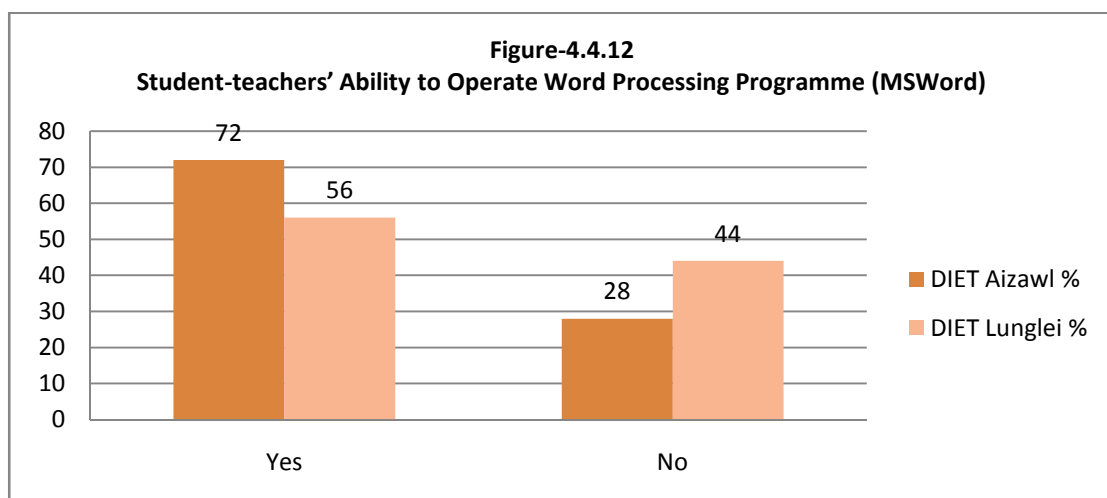


Table-4.4.12
Student-teachers' Ability to Operate Word Processing Programme (MSWord)

Statement	Response	DIET Aizawl		DIET Lunglei		t- value (t-test for percentage)
		N	%	N	%	
12. Operate a word processing program(MSWord)	Yes	66	72	54	56	df=187 t-value=3.45** Ho-2 Rejected
	No	26	28	43	44	
	Total	92	100	97	100	

***= Significant at .01level; Required 't-value' with df=187 at 0.05 =1.97, and at 0.01 =2.58*



programme, is higher than their counterparts from DIET Lunglei. Thus, the null hypothesis (Ho-2), in relation to the student-teachers' ability to operate word processing programme, is rejected.

4.4.13 Ability to Operate Spread Sheet Programme (MS Excel)

It is evident from Table No- 4.4.13, that 57% of student-teachers from DIET Aizawl, and 46% of them in Lunglei in DIET can operate spread sheet programme (MS Excel), whereas, 43% of student-teachers in DIET Aizawl and 54% of in DIET Lunglei can do so.

The same table further shows that the t-value of 1.52 in relation to the comparison of the student-teachers of both DIETs on their ability to operate spread sheet programme (MS Excel), being less than the required value with $df=187$, is not significant even at 0.05 level. On the basis of this finding it can be concluded that there is no significant difference between the student-teachers of two DIETs in relation to their ability to operate spread sheet programme (MS Excel). Hence, the null hypothesis (Ho-2), in relation to the student-teachers' ability to operate spread sheet programme (MS Excel) is accepted.

4.4.14 Ability to Operate a Graphic Programme (Photoshop)

As it can be seen from the above table, Table No- 4.4.14, majority of the student-teachers i.e. 42% of the student-teachers in DIET Aizawl and 47% of in DIET Lunglei can operate a graphic programme (Photoshop), whereas, 58% of them in DIET Aizawl and 53% in DIET Lunglei are unable to operate a graphic programme (Photoshop).

The same table further shows that the t-value of 0.69 in relation to the comparison of the student-teachers of both DIETs on their ability to operate a graphic programme (Photoshop), being less than the required value with $df=187$, is not significant even at 0.05 level. On the basis of this finding it can be concluded that there is no significant difference between the student-teachers of two DIETs in relation to their ability to operate a graphic programme (Photoshop). Hence, the null hypothesis (Ho-2), in relation to the student-teachers' ability to operate a graphic programme (Photoshop), is accepted.

Table-4.4.13
Student-teachers' Ability to Operate Spread Sheet Programme (MS Excel)

Statement	Response	DIET Aizawl		DIET Lunglei		t- value (t-test for percentage)
		N	%	N	%	
13. Operate spread sheet programme (MS Excel)	Yes	52	57	45	46	df=187 t-value=1.52 n.s. Ho-2 Accepted
	No	40	43	52	54	
	Total	92	100	97	100	

n.s. = Not Significant; Required 't-value' with *df*=187 at 0.05 =1.97, and at 0.01 =2.58

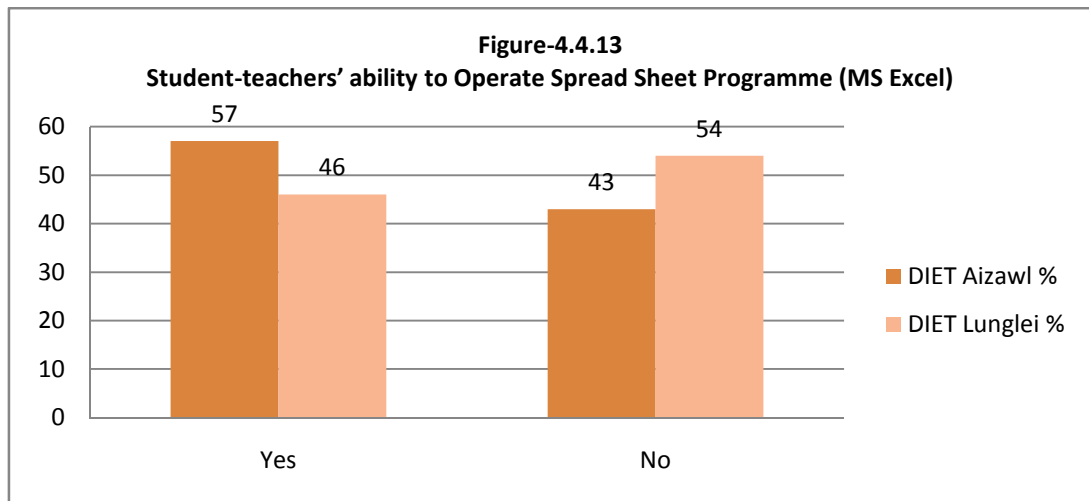
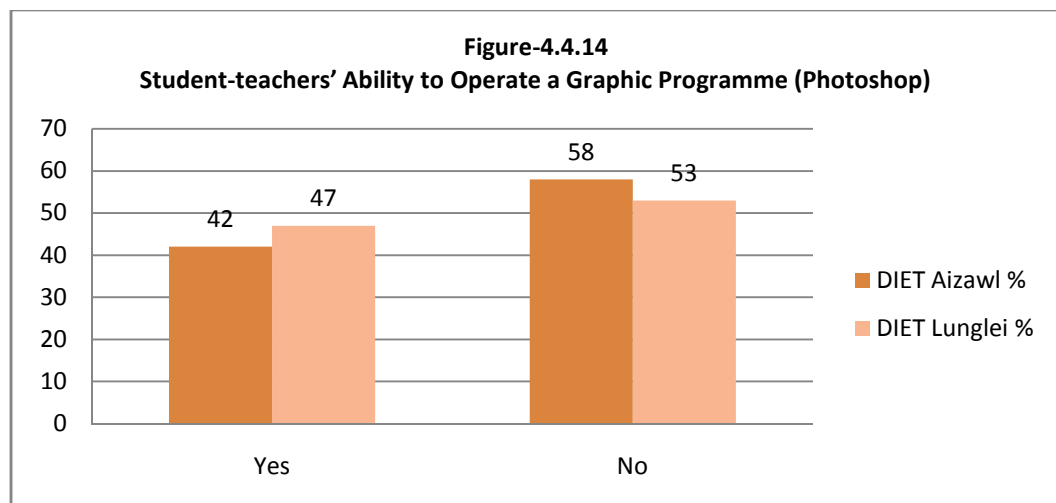


Table-4.4.14
Student-teachers' Ability to Operate a Graphic Programme (Photoshop)

Statement	Response	DIET Aizawl		DIET Lunglei		t- value (t-test for percentage)
		N	%	N	%	
14. Operate a graphic program (Photoshop)	Yes	39	42	46	47	df=187 t-value=0.69 n.s. Ho-2 Accepted
	No	53	58	51	53	
	Total	92	100	97	100	

n.s. = Not Significant; Required 't-value' with *df*=187 at 0.05 =1.97, and at 0.01 =2.58



4.4.15 Ability to Use the Internet for Social Networking

It was interesting to know vide Table No- 4.4.15, that a large majority of the student-teachers i.e. 79% from DIET Aizawl and 81% from DIET Lunglei are able to use the internet for social networking. Only 21% of them in DIET Aizawl and 19% of the in DIET Lunglei do not know how to use the internet for social networking.

The same table further shows that the t-value of 0.34 in relation to the comparison of the student-teachers of both DIETs on their ability to use the internet for social networking, being less than the required value with $df=187$, is not significant even at 0.05 level. On the basis of this finding it can be concluded that there is no significant difference between the student-teachers of two DIETs in relation to their ability to how to use the internet for social networking. Hence, the null hypothesis (H_0-2), in relation to the student-teachers' ability to use the internet for social networking, is accepted.

4.4.16 Ability to Use Computer for Storing Data and Documents

As it can be seen from Table No- 4.4.16, majority of the student-teachers i.e. 90% from DIET Aizawl and 80% from DIET Lunglei can use computer for storing data and documents, whereas, only 10% of them in DIET Aizawl and 20% of in DIET Lunglei cannot do so.

The same table further shows that the t-value of 1.93 in relation to the comparison of the student-teachers of both DIETs on their ability to use computer for storing data and documents, being slightly less than the required value with $df=187$, is not significant even at 0.05 level. On the basis of this finding it can be concluded that there is no significant difference between the student-teachers of two DIETs in relation to their ability to use computer for storing data and documents. Hence, the null hypothesis (H_0-2), in relation to the student-teachers' ability to use computer for storing data and documents, is accepted.

4.4.17 Ability to Remove Virus from Computer

As it can be seen from Table No-4.4.17, majority of the student-teachers i.e. 73% from DIET Aizawl and 71% from DIET Lunglei can remove computer virus; however, 27% of them in Aizawl and 29% in Lunglei cannot do so.

The same table further shows that the t-value of 0.38 in relation to the comparison of the student-teachers of both DIETs on their ability to remove virus from computer,

Table-4.4.15
Student-teachers' Ability to Use the Internet for Social Networking

Statement	Response	DIET Aizawl		DIET Lunglei		t- value (t-test for percentage)
		N	%	N	%	
15. Use internet for social networking	Yes	73	79	79	81	df=187 t-value=0.34 n.s. Ho-2 Accepted
	No	19	21	18	19	
	Total	92	100	97	100	

n.s. = Not Significant; Required 't-value' with *df*=187 at 0.05 =1.97, and at 0.01 =2.58

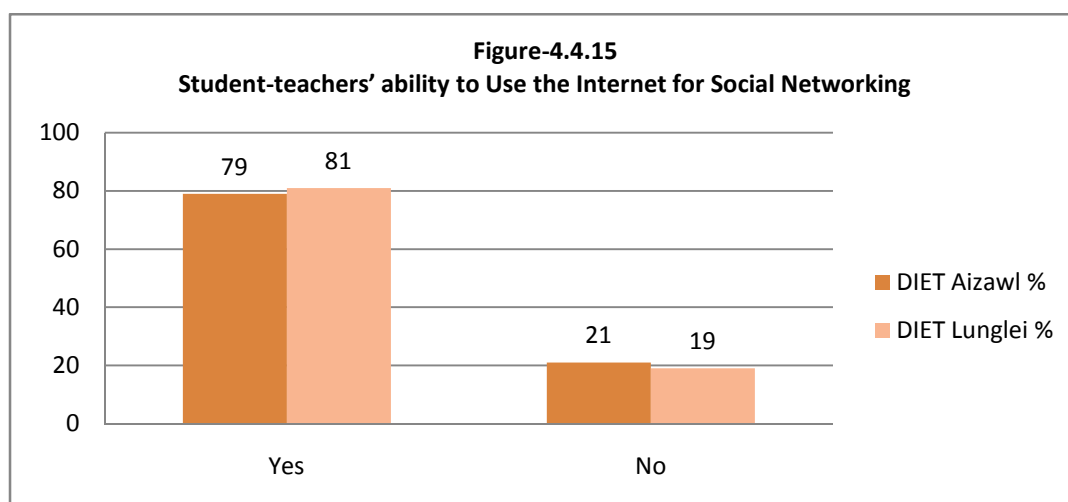
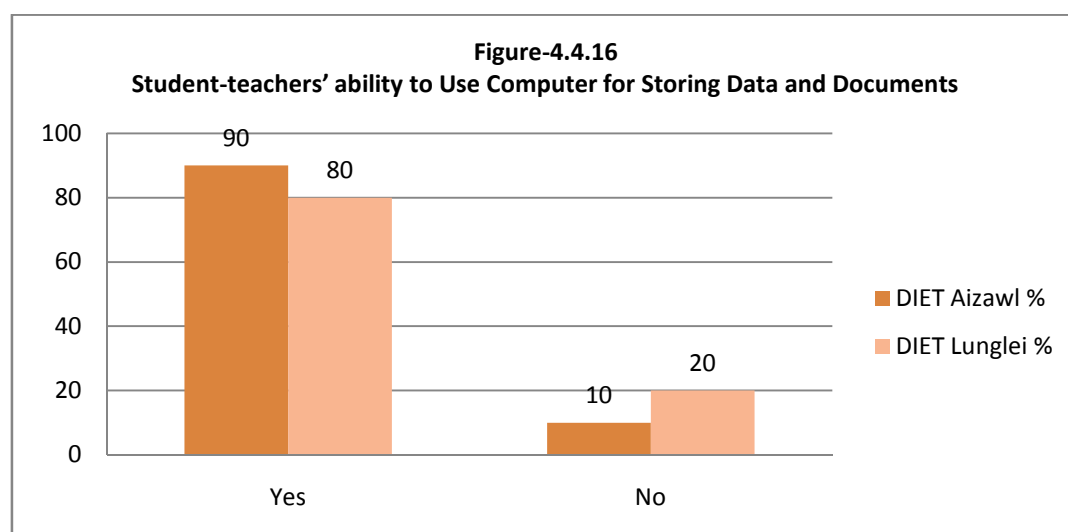


Table-4.4.16
Student-teachers' Ability to Use Computer for Storing Data and Documents

Statement	Response	DIET Aizawl		DIET Lunglei		t- value (t-test for percentage)
		N	%	N	%	
16. Use computer for storing data, document	Yes	83	90	78	80	df=187 t-value=1.93 n.s. Ho-2 Accepted
	No	9	10	19	20	
	Total	92	10	97	100	

n.s. = Not Significant; Required 't-value' with *df*=187 at 0.05 =1.97, and at 0.01 =2.58



being less than the required value with $df=187$, is not significant even at 0.05 level. On the basis of this finding it can be concluded that there is no significant difference between the student-teachers of two DIETs in relation to their ability to remove virus from computer. Hence, the null hypothesis (H_0-2), in relation to the student-teachers' ability to remove viruses from computer, is accepted.

4.4.18 Ability to Prepare Lesson Plan

An examination of data vide Table No- 4.4.18 reveals that 52% of student-teachers from DIET Aizawl and 54% from DIET Lunglei can use computer to prepare of lesson plan, whereas, 48% of them in Aizawl and 46% in Lunglei cannot do so.

The same table further shows that the t-value of 0.28 in relation to the comparison of the student-teachers of both DIETs on their ability to prepare of lesson plan, being less than the required value with $df=187$, is not significant even at 0.05 level. On the basis of this finding it can be concluded that there is no significant difference between the student-teachers of two DIETs in relation to their ability to use computer to prepare of lesson plan. Hence, the null hypothesis (H_0-2), in relation to the student-teachers' ability to prepare lesson plan, is accepted.

4.4.19 Ability to Play Computer Games

As it can be seen from the above table, Table No- 4.4.19, majority of the student-teachers i.e. 93% and 97% from DIET Aizawl as well as from DIET Lunglei can play games in a computer, whereas, only 7% of them in Aizawl and 3% from DIET Lunglei cannot play games in a computer.

The same table further shows that the t-value of 1.27 in relation to the comparison of the student-teachers of both DIETs on their ability to play computer games, being less than the required value with $df=187$, is not significant even at 0.05 level. On the basis of this finding it can be concluded that there is no significant difference between the responses student-teachers of the two DIETs. Hence, the null hypothesis (H_0-2), in relation to the student-teachers' ability to play computer games, is accepted.

4.4.20 Ability to Draw

By observing Table No- 4.4.20, it can be seen that half of the student-teachers i.e. 50% in DIET Aizawl and majority of the student-teachers i.e. 62% from DIET

Table-4.4.17
Student-teachers' Ability to Remove Viruses from Computer

Statement	Response	DIET Aizawl		DIET Lunglei		t-value (t-test for percentage)
		N	%	N	%	
17.Remove computer viruses	Yes	67	73	69	71	df=187 t-value=0.38 n.s. Ho-2 Accepted
	No	25	27	28	29	
	Total	92	100	97	100	

n.s. = Not Significant; Required 't-value' with $df=187$ at 0.05 = 1.97, and at 0.01 = 2.58

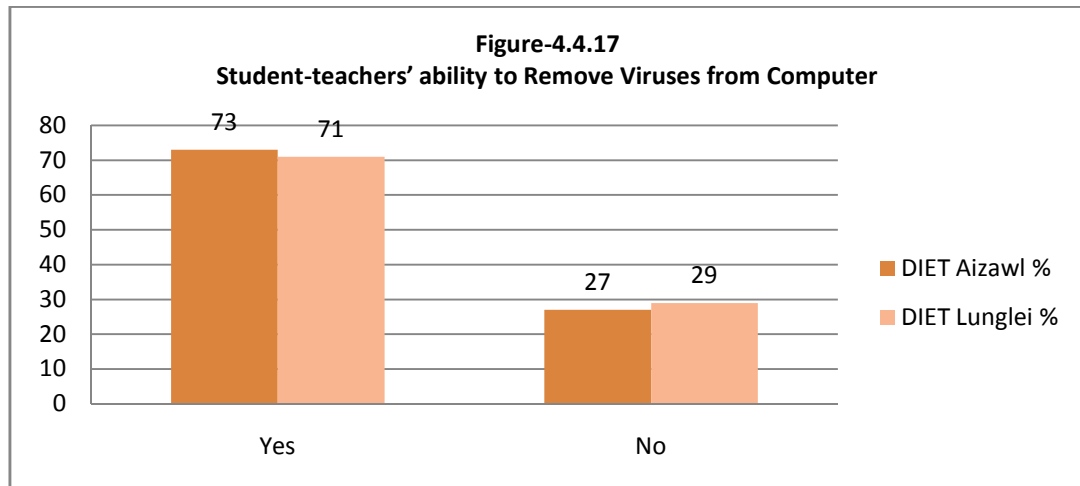


Table-4.4.18
Student-teachers' Ability to Prepare lesson plan

Statement	Response	DIET Aizawl		DIET Lunglei		t-value (t-test for percentage)
		N	%	N	%	
18.Preparation of lesson plan	Yes	48	52	52	54	df=187 t-value=0.28 n.s. Ho-2 Accepted
	No	44	48	45	46	
	Total	92	100	97	100	

n.s. = Not Significant; Required 't-value' with $df=187$ at 0.05 = 1.97, and at 0.01 = 2.58

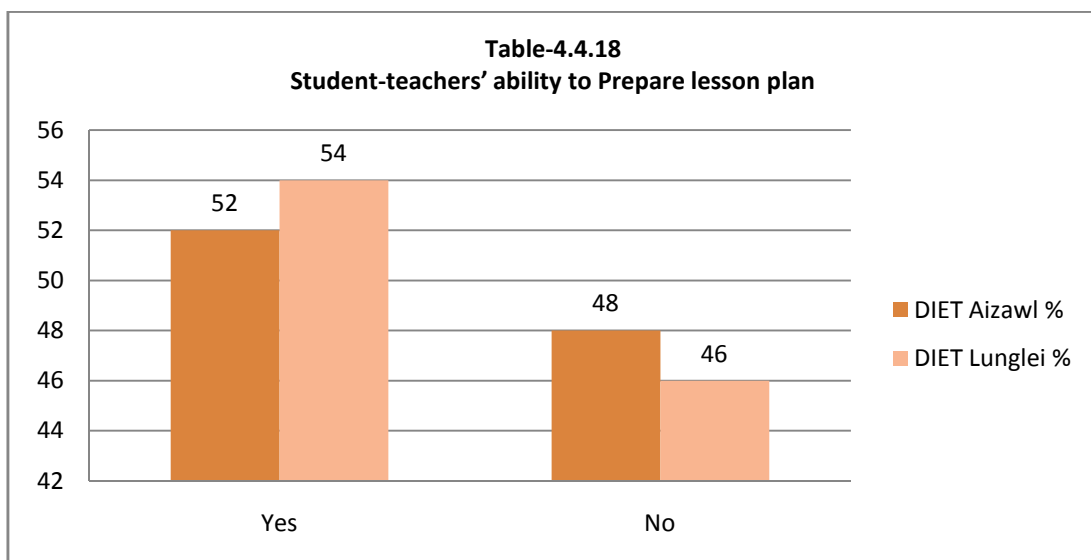


Table-4.4.19
Student-teachers' Ability to Play Games

Statement	Response	DIET Aizawl		DIET Lunglei		t- value (t-test for percentage)
		N	%	N	%	
19. Play games	Yes	86	93	94	97	df=187 t-value=1.27 n.s. Ho-2 Accepted
	No	6	7	3	3	
	Total	92	100	97	100	

n.s.= Not Significant; Required 't-value' with df=187 at 0.05 =1.97, and at 0.01 =2.58

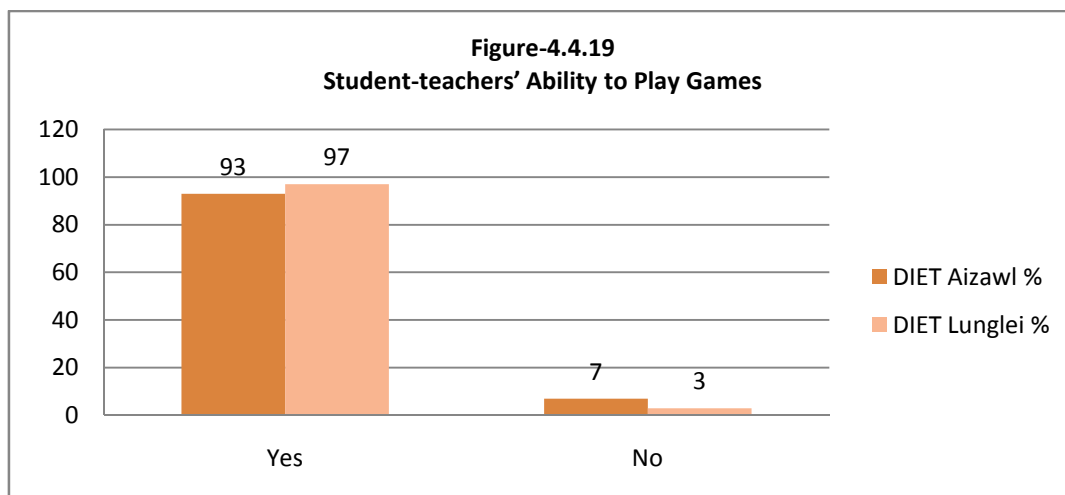
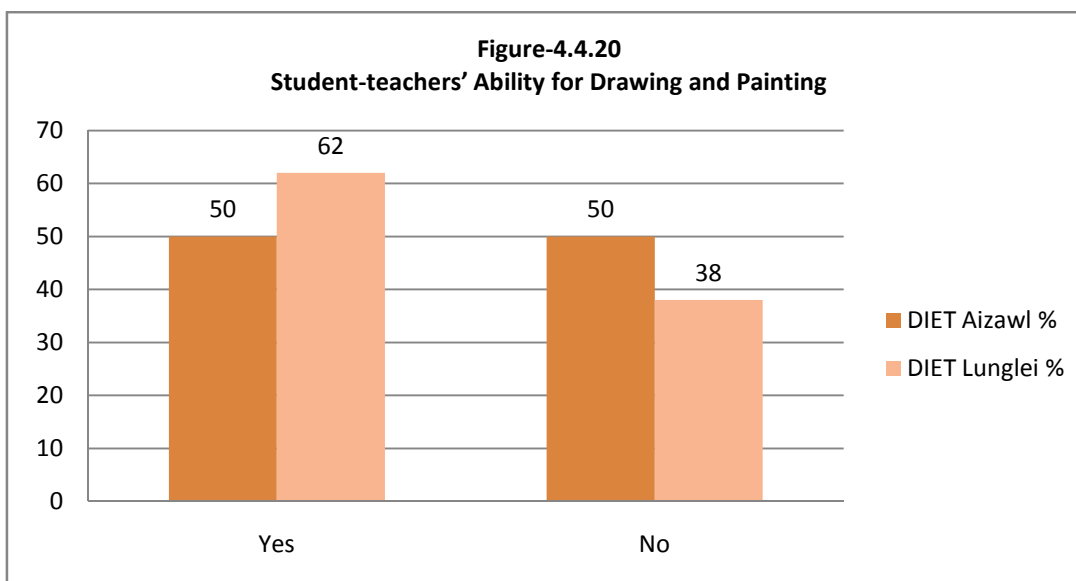


Table-4.4.20
Student-teachers' Ability for Drawing and Painting

Statement	Response	DIET Aizawl		DIET Lunglei		t- value (t-test for percentage)
		N	%	N	%	
20. Drawing	Yes	46	50	60	62	df=187 t-value=1.67 n.s. Ho-2 Accepted
	No	46	50	37	38	
	Total	92	100	97	100	

n.s.= Not Significant; Required 't-value' with df=187 at 0.05 =1.97, and at 0.01 =2.58



Lunglei can use the computer for drawing, the other half of the student-teachers in Aizawl and 38% of the student-teachers in Lunglei are unable to do so.

The same table further shows that the t-value of 1.67 in relation to the comparison of the student-teachers of both DIETs on their ability to drawing and painting with computer, being less than the required value with $df=187$, is not significant even at 0.05 level. On the basis of this finding it can be concluded that there is no significant difference between the responses of student-teachers of the two DIETs on this ability. Hence, the null hypothesis (H_0-2), in relation to the student-teachers' ability for drawing and painting with computer, is accepted.

4.4.21 Ability to Download Software from Internet

Majority of the student-teachers i.e. 65% from DIET Aizawl and 59% from DIET Lunglei can download software from internet (Table No- 4.4.21), at the same time 35% of the student-teachers in Aizawl and 41% of the student-teachers in Lunglei cannot do so.

The same table further shows that the t-value of 1.85 in relation to the comparison of the student-teachers of both DIETs on their ability to download software from internet, being less than the required value with $df=187$, is not significant even at 0.05 level. On the basis of this finding it can be concluded that there is no significant difference between the responses of student-teachers of the two DIETs. Hence, the null hypothesis (H_0-2), in relation to the student-teachers' ability to download software from internet, is accepted.

4.4.22 Ability to Download Games from Internet

A quick study of Table No- 4.4.22, it is apparent that majority of the student-teachers i.e. 71% from DIET Aizawl and 77% from DIET Lunglei can download games from internet while 29% of the student-teachers in Aizawl and 23% of the student-teachers in Lunglei cannot do so.

The same table further shows that the t-value of 0.94 in relation to the comparison of the student-teachers of both DIETs on their ability to download games from internet, being less than the required value with $df=187$, is not significant even at 0.05 level. On the basis of this finding it can be concluded that there is no significant difference between the responses of student-teachers of the two DIETs. Hence, the null hypothesis (H_0-2), in relation to the student-teachers' ability to download games from internet, is accepted.

Table-4.4.21
Student-teachers' Ability to Download Software from Internet

Statement	Response	DIET Aizawl		DIET Lunglei		t- value (t-test for percentage)
		N	%	N	%	
21.Download software from internet	Yes	60	65	57	59	df=187 t-value=1.85 n.s. Ho-2 Accepted
	No	32	35	40	41	
	Total	92	100	97	100	

n.s.= Not Significant; Required' t-value' with df=187at 0.05 =1.97, and at 0.01 =2.58

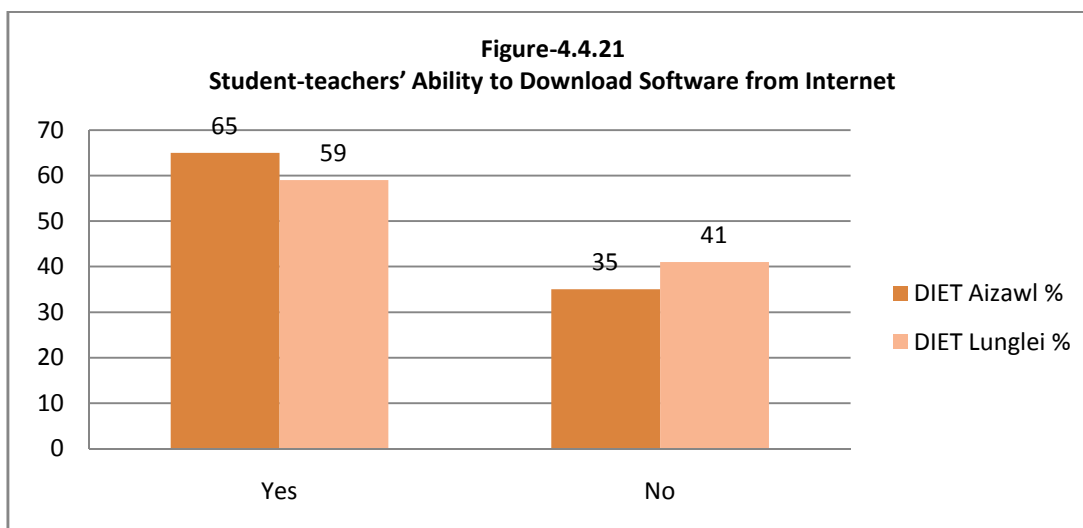
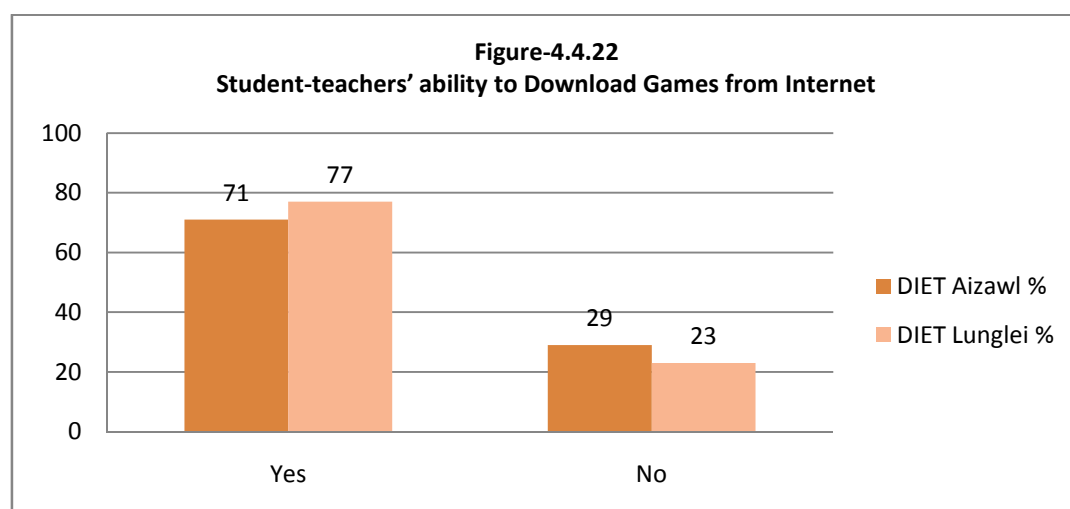


Table-4.4.22
Student-teachers' Ability to Download Games from Internet

Statement	Response	DIET Aizawl		DIET Lunglei		t-value for percentage t-test
		N	%	N	%	
22.Download games from internet	Yes	65	71	75	77	df=187 t-value=0.94 n.s. Ho-2 Accepted
	No	27	29	22	23	
	Total	92	100	97	100	

n.s.= Not Significant; Required' t-value' with df=187at 0.05 =1.97, and at 0.01 =2.58



4.4.23 Ability to Download Music from Internet

As it can be seen from Table No- 4.4.23, majority of the student-teachers i.e. 80% from DIET Aizawl and 87% from DIET Lunglei can download music from internet. 20% of the student-teachers in Aizawl and 13% of the student-teachers in Lunglei cannot do so.

The same table further shows that the t-value of 1.30 in relation to the comparison of the student-teachers of both DIETs on their ability to download music from internet, being less than the required value with $df=187$, is not significant even at 0.05 level. On the basis of this finding it can be concluded that there is no significant difference between the responses of the two DIETs. Hence, the null hypothesis (H_0-2), in relation to the student-teachers' ability to download music from internet, is accepted.

4.4.24 Ability to Visit Educational Blogs

A perusal of data vide Table No- 4.4.24, shows that 61% of the student-teachers from DIET Aizawl and 48% from DIET Lunglei visit educational blogs, whereas the other 39% of them in Aizawl and 52% in Lunglei do not visit educational blogs because they are not familiar with it.

The same table further shows that the t-value of 1.80 in relation to the comparison of the student-teachers of both DIETs on their ability to visit educational blogs, being less than the required value with $df=187$, is not significant even at 0.05 level. On the basis of this finding it can be concluded that there is no significant difference between the responses of the two DIETs. Hence, the null hypothesis (H_0-2), in relation to the student-teachers' ability to visit educational blogs, is accepted.

SECTION-5

4.5 Suggestions for Integration of ICT In Pre-Service and In-Service Teacher Education

4.5.1 Suggestions for Integration of ICT in the Pre-Service Teacher Education Programmes.

- 1) NCTE, the regulatory body for teacher education, while developing the curriculum framework for various teacher education programmes, should ensure that there is a compulsory component on ICT education.

Table-4.4.23
Student-teachers' Ability to Download Music from Internet

Statement	Responses	DIET Aizawl		DIET Lunglei		t- value (t-test for percentage) df=187 t-value=1.30 n.s. Ho-2 Accepted
		N	%	N	%	
23.Download music from internet	Yes	74	80	84	87	
	No	18	20	13	13	
	Total	92	100	97	100	

n.s.= Not Significant; Required' t-value' with df=187at 0.05 =1.97, and at 0.01 =2.58

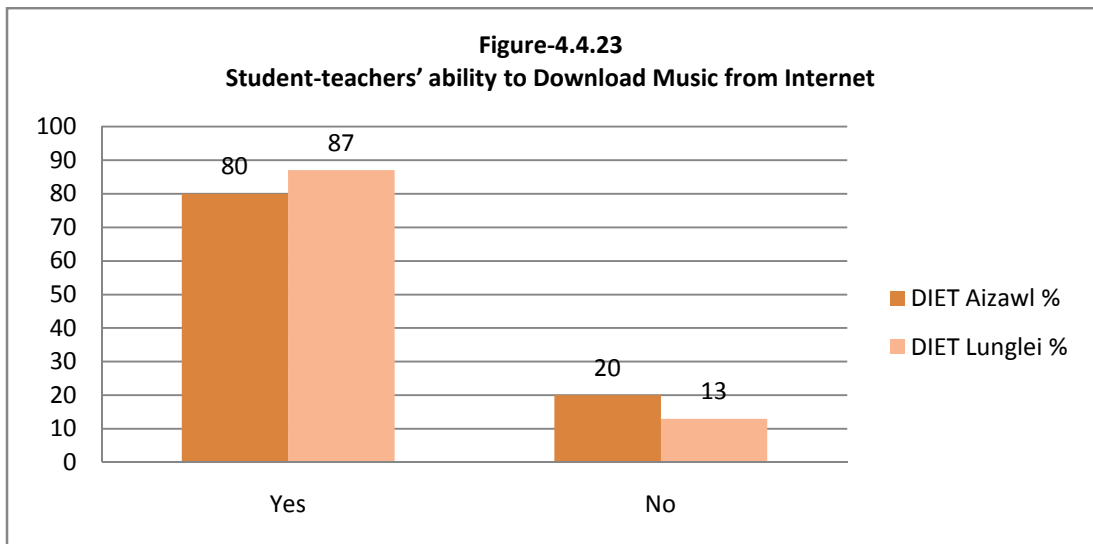
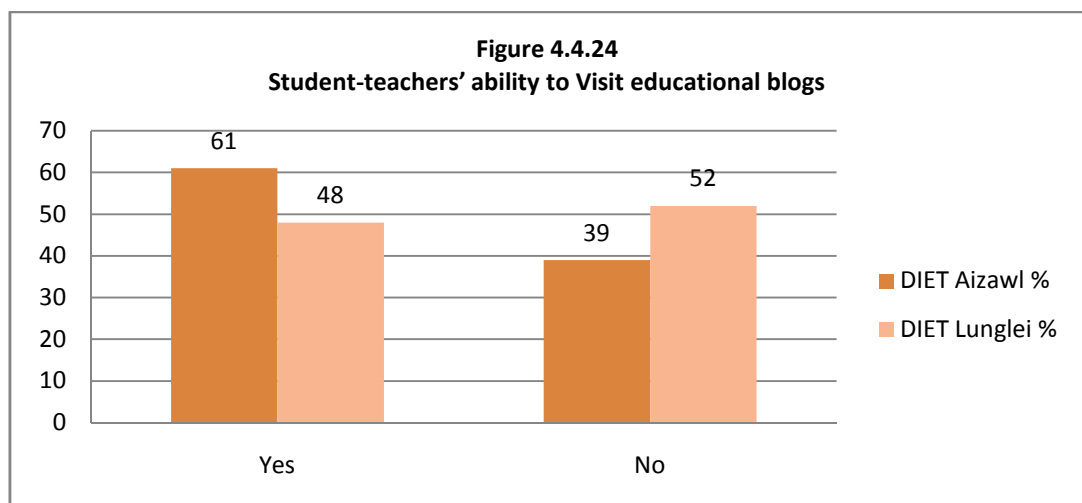


Table-4.4.24
Student-teachers' Ability to Visit Educational Blogs

Statement	Response	DIET Aizawl		DIET Lunglei		t- value (t-test for percentage) df=187 t-value=1.80 n.s. Ho-2 Accepted
		N	%	N	%	
24. Visit educational blogs	Yes	56	61	47	48	
	No	36	39	50	52	
	Total	92	100	97	100	

n.s.= Not Significant; Required' t-value' with df=187at 0.05 =1.97, and at 0.01 =2.58



- 2) Regional committees of NCTE, while taking up the inspection of TEIs for recognition, must ensure that the condition of availability of ICT lab and educational technology lab is never compromised by their Visiting Team members.
- 3) After granting recognition to the TEIs, the Regional Committees of NCTE should make provision of surprise inspection of these institutions to ensure that they don't dilute this condition of granting recognition.
- 4) The curriculum framework for various teacher education programmes should give adequate credits to the ICT component.
- 5) The affiliating universities/institutions that take up the inspection of pre-service basis should ensure that TEIs don't neglect this component. Any dilution to this effect should be reported by the affiliating institutions to the concerned Regional Committee of NCTE. If the need be the affiliating institution should withdraw its affiliation from such institutions.
- 6) Besides including the ICT component in curriculum framework, the NCTE should develop a model syllabus on ICT by involving national level experts.
- 7) The focus of pre-service teacher education needs to be shifted from computer education to integration of ICT in classroom teaching and learning.
- 8) Every student-teacher as well prospective teacher educator in the country, who is undergoing pre-service training, should be asked to prepare at least 10 to 15 lesson plans by integrating the various technologies.
- 9) If the component on ICT training cannot be managed by the TEIs then the NCTE may do fresh thinking on the eligibility condition for entry into teacher education programmes. The NCTE may make the diploma/certificate in ICT, along with the required academic qualification, as an essential condition for admission into pre-service teacher education programmes.
- 10) If the need be the NCTE may also make provisions in its regulations to allow the TEIs to out-source this component to the private sector institutions.

4.5.2 Suggestions for the Integration of ICT in In-service Teacher Education Programmes

- 1) The NCTE by involving NCERT and SCERTs should develop ICT training packages for all school subjects for in-service training of teachers.

- 2) SCERTs of all states should make optimum use of their SIT facility under EDUSAT for conducting in-service training on integration of ICT in classroom teaching learning.
- 3) All the TEIs including DIETs should be asked to work out their detailed annual plans for the conduct of ICT integration training for in-service teachers. If the need be every TEI be assigned a target number of teachers every year for such training.
- 4) The affiliating institutions should work out strategies and procedures for the supervision and monitoring of the quality of their in-service training programmes.
- 5) The monitoring institutions should ensure that the funds provided by the Government of India under SSA, RMSA and ICT @ school scheme for in-service training of school teachers are effectively and efficiently used by the states for the conduct of the required in-service training
- 6) In-service teachers should be given training on the use of advance ICT in order to keep them updated of the new software and new application available for teaching and how these software are integrated in the teaching process
- 7) In order to assess the national scenario on the quality and quantity of in-service training programmes for school teachers under SSA and RMSA, the government of India should assign a multicentric national level project to NCERT or NUEPA, and work out its future plans and strategies accordingly.
- 8) To improve the quality of in-service teacher education it is desired to make it residential training. If the need be the SCERTs, IASEs, CTEs DIETs, and BRCs etc. that are involved in the conduct of such training be provide the required infrastructure in the form of hostels/guest houses with subsidized dining facility for trainees and resource persons.
- 9) The process and criteria for the selection of resource persons for in-service training be made more objective, transparent and rigorous. If the need be such selections should be done by a district/state level committee.
- 10) Training modules on integration of ICT in all school subjects for in-service teacher education be developed by all SCERTs in the country.
- 11) The promotion of teachers to next higher grade be linked not only with the years of service and number of in-service training programmes attended

during the assessment period, but with competencies and ICT skills acquired by them during these trainings.

The main finding of the study, recommendations, and suggestions for further research have been presented in the following chapter.

Chapter-5
Main Finding,
Recommendations,
Suggestions for Further Research
and Conclusion

Chapter-5

Main Finding, Recommendations, Suggestions for Further Research and Conclusion

5.1 Main Findings

a. In Relation to ICT Infrastructure

1. There is reliable electricity, landline telephones and fax machines in both DIET Aizawl and DIET Lunglei, where as generator power and inverter are available only in DIET Aizawl, and both the DIET do not have solar power.
2. DIET Aizawl have a separate unit for ICT, computer lab with 30 computers and the institution has used computers for more than 8 years, while DIET Lunglei do not have any of the ICT unit.
3. There are laptops, Server with Terminals, Scanner, Modem, Broadband Antenna, Generator/ Solar Package, Institution website in the DIETs, Computers, Video Camera, Common service centre in neighbourhood and Dish TV connection are available in DIET Aizawl. Web camera, Community/campus radio station, Educational CDs/DVDs, Radio, Video Conferencing Facility are not available in both DIETs
4. The ICT facilities in DIET Aizawl are operate, repair and maintain by staffs from technology cells, private firms and lecturers while the operation, repairing and maintenance are all done by lecturers and office staffs in DIET Lunglei
5. There are no computers fees taken from Both DIET Aizawl and DIET Lunglei, neither there are computer course provided. In a week the student teachers have two IT classes and the computers are open for every student-teacher during their free time but not after classes, at the same time, there is no computer available for the student-teachers in DIET Lunglei.

6. The administration, database, library in DIET Aizawl are supported by ICT where as DIET Lunglei is still not yet functioned with ICT.
7. The infrastructure proposed by both the DIETs for a more effective use of technology. DIET Aizawl proposed for Smart board, Flat TV and a good Sound system and as for in DIET Lunglei being less equipped they proposed for Generator, projector and Smart TV.

b. In Relation to Opinions of Student-teachers on various Issues Relating to ICT.

1. A large majority (86 to 96 percent) of student-teachers from both DIETs like the use of ICT.
2. A large majority (83 to 89 percent) of student-teachers from both DIETs are not scared of ICT.
3. A large majority (94 to 95 percent) of student-teachers from both DIETs opined that ICT helps them learn things more easily.
4. Majority (62 to 78 percent) of student-teachers from both DIETs opined that they do not feel ICT is making them uncomfortable.
5. Majority (76 to 80 percent) of student-teachers from both DIETs opined that knowing how to use ICT will help them do well as a teacher.
6. Majority (65 to 86 percent) of student-teachers from both DIETs opined that they will need ICT in their classroom teaching.
7. A large majority (90 to 92 percent) of student-teachers from both DIETs conceived that ICT occupies a great place in the retaining of information.
8. Majority (74 to 85 percent) of student-teachers from both DIETs opined that learning is not a waste of time.
9. Majority (70 percent) of student-teachers from both DIETs opined that ICT saves time and effort.
10. Majority (56 to 67 percent) of student-teachers from both DIETs opined that ICT will supplement their classroom teaching.
11. A considerable (36 to 51 percent) percentage of student-teachers from both DIETs could not make a decision on whether they prefer doing thing manually or by using ICT.
12. A large majority (85 to 88 percent) of student-teachers from both DIETs enjoy using ICT.

13. A large majority (55 to 87 percent) of student-teachers from both DIETs opined that they would not avoid the use of ICT.
14. Majority (57 to 60 percent) of student-teachers from both DIETs opined that ICT offers real advantage over traditional methods of instruction.
15. Majority (56 to 70 percent) of student-teachers from both DIETs opined that they feel comfortable talking with others about ICT.
16. Majority (57 to 62 percent) of student-teachers from both DIETs opined that ICT fits well into their teaching goal.
17. A large majority (75 to 94 percent) of student-teachers from both DIETs opined that ICT can improve the quality of students' learning.
18. A large majority (81 to 86 percent) of student-teachers from both DIETs opined that ICT will improve the quality of education.
19. Majority (70 to 77 percent) of student-teachers from both DIETs opined that ICT should have a place in schools.
20. A considerable amount (40 to 43 percent) of student-teachers from both DIETs opined that class time is too limited or not enough for using ICT.

c. In Relation to Level of Preparedness of Student-teachers to Use ICT

1. A large majority (96 to 98 percent) of student-teachers from both DIETs can open a file in a computer.
2. A large majority (87 to 92 percent) of student-teachers from both DIETs can create/edit and save a document in a computer.
3. A large majority (86 to 91 percent) of student-teachers from both DIETs can copy files to and from CD, pen-drive, hard-disk, etc.
4. A large majority (96 to 97 percent) of student-teachers from both DIETs can delete a file in a computer.
5. Majority (64 to 67 percent) of student-teachers from both DIETs can print documents, pictures, graphs, etc. in a computer.
6. A large majority (76 to 90 percent) of student-teachers from both DIETs can browse the internet to look up information for studies in a computer.
7. A large majority (77 to 89 percent) of student-teachers from both DIETs can copy and download files from the internet in a computer.
8. Majority (54 to 68 percent) of student-teachers from both DIETs can are unable to create a PowerPoint presentation in a computer.

9. A large majority (64 to 76 percent) of student-teachers from both DIETs are unable to create a multimedia presentation.
10. Majority (51 to 60 percent) of student-teachers from both DIETs can compose and send email.
11. Majority (58 to 62 percent) of student-teachers from both DIETs can install new software on a computer.
12. A large majority (56 to 72 percent) of student-teachers from both DIETs can operate a word processing programme (MSWord) in a computer.
13. Majority (46 to 57 percent) of student-teachers from both DIETs can operate spread sheet programme (MS Excel), in a computer.
14. Majority (53 to 58 percent) of student-teachers from both DIETs are unable to operate a graphic programme (Photoshop) in a computer.
15. A large majority (79 to 81 percent) of student-teachers from both DIETs are able to use the internet for social networking
16. A large majority (80 to 90 percent) of student-teachers from both DIETs use computer for storing important data, document.
17. A large majority (71 to 73 percent) of student-teachers from both DIETs can remove viruses from computer.
18. Majority (52 to 54 percent) of student-teachers from both DIETs can use computer to prepare of lesson plan.
19. A large majority (97 percent) of student-teachers from both DIETs can play games in a computer.
20. A large majority (50 to 62 percent) of student-teachers from both DIETs can draw using a computer.
21. Majority (59 to 65 percent) of student-teachers from both DIETs can download software from internet.
22. A large majority (71 to 77 percent) of student-teachers from both DIETs can download games from internet.
23. A large majority (80 to 87 percent) of student-teachers from both DIETs can download music from internet.
24. A considerable number (48 to 61 percent) of student-teachers from both DIETs visit educational blogs.

5.2 Recommendations

i) Specific Recommendations

a) Recommendations in Relation to ICT components in elementary teacher education programmes

1. There is no paper or subject of ICT/Educational Technology in the syllabus of pre-service elementary teacher education; therefore it is recommended that a compulsory paper of ICT/Educational Technology should be included in the revised syllabus under NCTE Regulation, 2014.
2. In case the NCTE decides to introduce a paper on educational technology, then the content of this paper should be more focused on practical rather than theory, and integration of ICT in teaching-learning, evaluation and administration should be the central part of the this paper.

b) Recommendations in Relation to ICT Infrastructure

1. ICT lab need to be established in DIET Lunglei.
2. DIETs should be provided with annual budget for maintenance and up-gradation of ICT infrastructure.
3. Experts in ICT must always be available in the teacher training institution.
4. ICT infrastructure should be updated and upgraded every year.

c) Recommendations with regard to Student-teachers Opinions on Issues Relating to the Use of ICT

1. As large number of student are not prepared to use Spreadsheet, Photoshop, and multimedia presentation, therefore, the ICT training should be more focused on these areas.
2. Solar energy back up should be provided to the DIETs for the optimum utilization of ICT Lab.

ii) General Recommendations

1. New software applications should be introduced to the teacher educators and student-teachers on regular basis.
2. ICT training for teacher educators should be held more frequently by SSA and RMSA, and the quality and duration of these training programmes need to be improved and increased.
3. Workshops should be held frequently for the teacher educators to keep themselves technologically updated.

4. Classroom should be properly facilitated with ICT, so as to enable teacher-educators and student-teachers to integrate ICT in teaching and learning.
5. Wifi should be set up in the teacher training institutions.
6. Training should be given for both genders in operating basic hardware technologies.
7. Rewards should be given to teacher-educators and student teachers with best use of technology.

5.3 Suggestions for Further Research

The use of ICT in teaching learning and training of teachers for all type and levels of education is an emerging area of research. A review research studies in 2nd chapter suggests that this area need to be adequately explored by the Indian researchers. The scholar in this study has confined her study to the opinion survey and preparedness of student-teachers two DIETs in Mizoram. However, in the course of the conduct of this study she has realized that there are still many gaps of research in this area, and therefore she would like the future researchers to take up their research on the topics suggested as under:

1. A comparative study of traditional and ICT based teaching in relation to imparting of instructions in science/social-studies/language subject at elementary/secondary/higher education level.
2. Evaluation of teacher education programmes on ICT under SSA.
3. Evaluation of teacher education programmes on ICT under RMSA.
4. Status study on the use of ICT by teachers in elementary/secondary/higher education.
5. A comparative study on the use of ICT by college and university teachers under science, commerce and arts streams.
6. Gender issues in the use of computers in elementary/secondary teacher education programmes in Mizoram.
7. Use of ICT by teacher educators in DIETs, CTEs and IASEs: An analytical study.
8. Status and use of ICT infrastructure in secondary and higher secondary schools/colleges/CTEs/IASEs/university departments.

9. Gender assessment of ICT access and usage in north eastern states: a comparative study
10. Moving of elementary/secondary teacher education into the digital age: Problems and prospect.
11. Transforming teacher education: A study on the role and power of ICT.
12. Status survey on the use of ICT in pre-service and in-service teacher education programmes in Mizoram.
13. Assessing the quality of ICT training programmes for teacher education in Mizoram.
14. ICT infrastructure in teacher education institutions in Mizoram: A study on its access and usage.
15. A comparative study on the role of center and state government in the development ICT education in Mizoram.

5.4 Conclusion

In the present study, two DIETs from Aizawl and Lunglei participated with 189 student-teachers. It was gratifying to report that the student-teachers have quite a positive opinion towards the use of ICT, its use in teaching process, its increase of retention, its ability to improve the quality of education. But at the same time, most of the student-teachers seemed to be confused when they were asked to choose whether they would use ICT in all subject matter or they would rather do thing manually. The student-teachers are generally prepared well enough to use ICT. While there are high percentages of preparedness in simple computer tasks, the percentages of preparedness in tasks like Powerpoint and multimedia presentation, Spreadsheet, Photoshop, etc. are low even though the number of student-teachers who are capable of doing the mentioned task are more in number then the one who cannot. The condition of ICT facilities in DIET Aizawl was fair enough; however, the condition of ICT facilities and infrastructure in DIET Lunglei was disappointing. It was found that there is a presence of high potential in the student-teachers from both DIETs in the use of ICT in teaching and learning.

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- <https://ec.europa.eu/digital-single-market/en/survey-schools-ict-education>

Appendices

APPENDIX-A

DIETs in Mizoram

Sl. No.	Name of the DIET	Location
1	DIET Aizawl	Chaltlang, Aizawl, Mizoram, PIN-796012
2	DIET Lunglei	Serkawn Melte, Lunglei, Mizoram, PIN-796691
3	DIET Champhai	Zotlang, Champhai, Mizoram, PIN-796321
4	DIET Kolasib	Saidan, Kolasib, Mizoram, PIN-796081
5	DIET Serchhip	Chanmari Vengthar, Serchhip, Mizoram, PIN-796181
6	DIET Lawngtlai	Thingkah, Lawngtlai, Mizoram, PIN-796891
7	DIET Siaha	College Vaih, Siaha, Mizoram, PIN-796901
8	DIET Mamit	Field Veng, Mamit, Mizoram, PIN-796441

Appendix- B

Information Schedule

(For Principal)

1. Please indicate whether you have the following facilities in the DIET			
Sl. No.	Facilities	Availability	
		Yes	No
1.	Reliable electricity		
2.	Solar power		
3.	Generator power		
4.	Inverter		
5.	Land-line telephone		
6.	Fax machines		
7.	Cable TV/ WLL/ DTH		

2. Is there a separate unit for ICT	Yes	No

3. Is there a computer lab	Yes	No
If Yes, the number of computers		

4. If you have the following facilities, please provide the number available		
Sl. No.	Items	Quantity
	Computers	
	Laptops	
	Server with Terminals	
	No. of Internet Nodes	
	Scanner	
	Web camera	
	Modem	
	Broadband Antenna	

	Generator/ Solar Package	
	Video Camera	
	Audio/language lab	
	Common service centre in neighborhood	
	Community/campus radio station	
	Dish TV connection	
	Educational CDs/DVDs	
	Radio	
	Institution blog	
	Institution website	
	Subject Specific Software in Computers/ TV	
	Video Conferencing Facility	

5. Who operates the ICT facilities in the institution

--

6. Who repairs and maintains the ICT facilities

--

7. Is there a computer course? Yes/No

--

8. Is there a separate computer fee? If yes, how much is the fee per month?

--

9. Do the student-teachers use the computer? If yes, how many hour(s) in a day?

--

10. Do the student-teachers use the computer after class? If yes, how many hour(s) in a day?

--

11. Do the student-teachers use internet after class? If yes, how many hour(s) in a day?

12. Is there a separate budget for the implementation of ICT plan? If yes, please mention the amount.

13. Any other source of fund for ICT? If yes, please mention the source

14. Are the following functions supported by ICT in the institution? Yes/No		
1.	Administration	
2.	Database	
3.	Library	

Sl. No	What else do you think can be included in your infrastructure to use technology more effectively?	
	Technology Tools	Order of Preference
1		
2		

15. Give suggestions for the improvement of the ICT infrastructure

Appendix- C

Opinionnaire (For Student-Teachers)

Please put a tick mark on the box provided on your level of agreement or disagreement with the following statement				
Sl. No.	Statement	Disagree	Neutral	Agree
1.	I like using advanced ICT.			
2.	ICT scares me.			
3.	ICT help me learn things more easily.			
4.	Technology makes me feel uncomfortable.			
5.	Knowing how to use ICT will help me do well as a teacher.			
6.	I think I would ever need ICT in my classroom teaching.			
7.	ICT occupies a great place in retaining information.			
8.	Learning about ICT is a waste of time.			
9.	ICT saves time and effort.			
10.	ICT will supplement classroom teaching			
11.	I would rather do things by hand than with a ICT.			
12.	Using ICT is enjoyable.			
13.	I would avoid ICT as much as possible.			
14.	Teaching with ICT offers real advantages over traditional methods of instruction.			
15.	I do not feel comfortable talking with others about ICT.			
16.	ICT fits well into my teaching goal.			
17.	ICT cannot improve the quality of students' learning.			
18.	ICT will improve the quality of education.			
19.	ICT should have no place in schools.			
20.	Class time is too limited for using ICT.			

Appendix-D

Questionnaire

(For Student-Teachers)

Please indicate the purpose for which you use ICT in DIET			
Sl. No.	Item	Yes	No
1.	Open a file in a computer (document, movies, music, etc)		
2.	Create/edit and save a document.		
3.	Copy/move files to and from CD, pendrive, hardisk, etc.		
4.	Delete a file		
5.	Print documents, pictures, graphs, etc.		
6.	Browse the internet to look up information for studies.		
7.	Copy and download files from the internet		
8.	Create a PowerPoint presentation		
9.	Create a multimedia presentation		
10.	Compose and send email		
11.	Install new software on a computer		
12.	Operate a word processing programme(MS Word)		
13.	Operate spread sheet programme (MS Excel)		
14.	Operate a graphic programme (Photoshop)		
15.	Use the internet for social networking		
16.	Use computer for storing data, document		
17.	Remove computer viruses		
18.	Preparation of lesson plan		
19.	Play games		
20.	Drawing		
21.	Download software from internet		
22.	Download games from internet		
23.	Download music from internet		
24.	Visit educational blogs		

APPENDIX- E

SYLLABUS FOR TWO-YEAR DIPLOMA IN TEACHER EDUCATION (D.T.ED.) OFFERED BY DIESTS IN MIZORAM TILL 2014				
FIRST YEAR D.T.Ed				
1. Compulsory				
Sl. No	Subject	External	Internal	Total
1.	Emerging Indian Society & Elementary Education in India-Paper I.	80	20	100
2.	Psychology of Teaching & Learning-Paper I	80	20	100
3.	School Management	40	10	50
4.	Art Education	40	10	50
5.	Pedagogical Analysis English (Primary)	80	20	100
6.	Pedagogical Analysis Mizo (Primary)	80	20	100
7.	Pedagogical Analysis Hindi (Primary)	40	10	50
8.	Pedagogical Analysis Science (Primary)	80	20	100
9.	Pedagogical Analysis Mathematics (Primary)	80	20	100
10.	Pedagogical Analysis Social Science (Primary)	80	20	100
11.	Action Research (Theory only)	40	10	50
12.	Teaching Practical (Any one Subject of Primary Stage)	40	10	50
13.	Practical	-	100	100
2. Additional Specialisation (optional) Any one of the following				
14.	a. Educational Technology	80	20	100
	b. Pre-School Education	80	20	100
	c. Population Education	80	20	100
	d. Education Of Children with special needs	80	20	100
Total		840	310	1150
SECOND YEAR D.T.Ed				
3. Compulsory				
Sl. No.	Subject	External	Internal	Total
1.	Emerging Indian Society & Elementary Education in India-Paper II	80	20	100
2.	Psychology of Teaching & Learning-Paper II	80	20	100
3.	Evaluation in Education	40	10	50
4.	Health and Physical Education	40	10	50
5.	Pedagogy Analysis-English (Middle)	80	20	100
6.	Pedagogy Analysis-Mizo (Middle)	80	20	100
7.	Pedagogy Analysis-Hindi (Middle)	40	10	50
8.	Pedagogical	80	20	100
9.	Pedagogy Analysis-Mathematics (Middle)	80	20	100
10.	Pedagogy Analysis-Social Science (Middle)	80	20	100

11.	Action Research (Internal Practical only)	40	10	50
12.	Teaching Practical	40	10	50
13.	Practical	100		100
4. Additional Specialisation (optional) Any one of the following				
14.	a. Educational Technology	80	20	100
	b. Pre-School Education	80	20	100
	c. Population Education	80	20	100
	d. Education Of Children with special needs	80	20	100
5. Instructions				
Practical Teaching Each Teacher-Trainee should offer 16 (sixteen) lessons in each subject at Primary level i.e. 16X5=60 lessons (first year) and 16 (sixteen) lesson in each subject at Middle level i.e. 16X5=80 lessons (second year) Total 80+80=160 lesson in two years.				
Practical: There are 5 (five) areas for the practical- they are:				
	1. Science	-	20	20
	2. Psychology (simply test only)	-	20	20
	3. Micro-Teaching	-	20	20
	4. Working with school & community and Work Education.	-	20	20
	5. Organization of Games & Sport	-	20	20
	Total	840	310	1150
Internal Assessment:				
All the theory papers shall consist of 20% of maximum marks of the paper i.e. 20 marks out of the 100 marks and 10 marks out of 50 marks for internal assessment. The concerned Lecturer-In-Charge shall keep a record of the activities performed by each Teacher Trainee.				

Appendix-F

CURRICULUM FOR DIPLOMA IN EDUCATION(D.Ed.) IN DIETs IN MIZORAM (w.e.f.2014)					
SEMESTER BREAK-UP AND CURRICULUM STRUCTURE					
I SEMESTER					
Sl. No.	Course Title	Theory		Practicum	Total
		External	Internal		
1.	Childhood and the Development of Children	50	20	30	100
2.	Contemporary Indian Society	70	30	-	100
3.	Education, Society, Curriculum and Learners	70	30	-	100
4.	Cognition, Learning and the Socio-Cultural Context	70	30	-	100
5.	Proficiency in English	35	15		50
Total Marks		295	125	30	450
II SEMESTER					
Sl. No.	Course Title	Theory		Practicum	Total
		External	Internal		
1.	Towards Self-Understanding and Evolving an Educational Vision I	30	20	-	50
2.	Pedagogy across the Curriculum	30	20	-	50
3.	Mathematics Education for the Primary School Child	70	30	-	100
4.	Proficiency in Hindi	35	15		50
	Practicum				
5.	Work and Education		50		50
6.	Children's Physical and Emotional Health, School Health and Education	70	30	-	100
7.	Pre Internship: 2 weeks		50	-	50
Total Marks		235	215		450
III SEMESTER					
Sl. No.	Course Title	Theory		Practicum	Total
		External	Internal		
1.	Pedagogy of English Language	70	30	-	100

2.	Pedagogy of Science	70	30	-	100
3.	Pedagogy of Mathematics	70	30	-	100
4.	Towards Self-Understanding and Evolving an Educational Vision II	30	20		50
5.	Understanding Language, Early Literacy and Language Education	70	30	-	100
Total marks		310	140		450

IV Semester

S. No.	Course Title	Theory		Practicum	Total
		External	Internal		
1.	Pedagogy of Environmental Studies	35	15	-	50
2.	Pedagogy of Social Science	35	15	-	50
3.	Pedagogy of Mizo	70	30	-	100
4.	Diversity, Gender and Inclusive Education	35	15	-	50
5.	School Culture, Leadership and Change	35	15	-	50
	Practicum				
6.	Creative Drama, Fine Arts and Education		50		50
7.	School Internship: 7-8 weeks	105	45		150
Total Marks		315	185		500
Grand Total		1850			