ICT IN TEACHING- LEARNING PROCESS OF GOVERNMENT COLLEGES IN AIZAWL CITY: STATUS AND PROBLEMS

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ICT IN TEACHING LEARNING PROCESS OF GOVERNMENT COLLEGES IN AIZAWL CITY: STATUS AND PROBLEMS

By

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Submitted

In partial fulfillment of the requirement of the Degree of Master of philosophy in Education of Mizoram University, Aizawl.

C E R T I F I C A T E

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This is to certify that the work incorporated in this Dissertation entitled **ICT in Teaching-Learning Process of Government Colleges in Aizawl City : Status and Problems** is a bonafide research work carried out by **Vanlalruati** under my supervision for her M.Phil. Degree and the same has not been submitted previously for any degree.

Dated: Aizawl   (**Prof. LALHMASAI CHUAUNGO**)

The……………..   **Supervisor**

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D E C L A R A T I O N

Mizoram University

December   2019

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

This is being submitted to the Mizoram University for the degree of Master of Philosophy in Education.

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<div align="right">(VANLALRUATI)</div>

Dated, Aizawl

The …………….

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CHAPTER – I

INTRODUCTION

CHAPTER I

INTRODUCTION

1.1.0   ICT in Education

The first evolution of the concept of ICT was witnessed when paper and ink together with the print media were invented. The term 'information and communication technology' popularly called ICT had been used by academic researchers since 1980 and was used in a report to the UK Government by Dennis Stevenson in 1997 and in the revised curriculum for England, Wales and Northern Ireland in 2000 (Mangal&Mangal, 2010). The influence of ICT is found in almost all the aspects of human life today including education.

UNESCO defines ICT as "a diverse set of technological tools and resources used to transmit, store, create, share or exchange information. These technological tools and resources include computers, the Internet (websites, blogs, and emails), live broadcasting technologies (radio, television, and webcasting), recorded broadcasting technologies (podcasting, audio, and video players and storage devices) and telephony (fixed or mobile, satellite, video-conferencing, etc.) (uis.unesco.org)".

Powerful combination of ICTs such as open-source software, satellite technology, local language interfaces, easy to use human-computer interfaces, digital libraries, etc. has been made by India with a long-term plan to reach the remotest areas. To promote e-learning, community service centers have been started throughout the country (Bhattacharya & Sharma, 2007).

Some remarkable initiatives taken in India in the use of ICT in education are:

i. The use of television and internet technologies by National Programme on Technology Enhanced Learning and Eklavya.

ii. The use of internet technologies, television and radio by Indira Gandhi National Open University (IGNOU)

iii. Entering a strategic alliance by Calcutta University with NIIT for providing programs through virtual classrooms.

iv. The use of a mobile-learning center by Jadavpur University.

v. Development of 'Brihaspati', an open-source e-learning platform by IIT-Kanpur.

vi. The launching of a Centre for Distance Engineering Education Program by IIT-Bombay as emulated classroom interaction through the use of real-time interactive satellite technology.

vii. Installation of Network facilities at the UGC office with the help of ERNET, Ministry of Information and Technology, Government of India.

viii. Initiation of a scheme called 'ICT for Teaching-Learning Process' by UGC for achieving quality and excellence in higher education.

ix. The encouragement of the creation of e-content/learning material for the teaching-learning process and management of education in colleges and universities by UGC

x. The launching of a mega program 'UGC INFONET', a network of Indian Universities and Colleges for integrating Information and Communication

Technology (ICT) in the process of teaching, learning and education management (Mondal & Mete, 2012).

The rapid pace of technological and scientific advancement has significantly transformed educational technology. It also has upgraded and improved the teaching-learning process in many ways. Teaching-learning today has been conducted through e-learning, mobile-learning, web-based learning, multi-media learning, etc. The application of modern technology in education is all the more important in professional courses to make the learning more fruitful to meet the diversity of the learners. The growth of ICT has brought in rapid changes because of its appropriateness, applicability and versatility in use for classroom teaching (Gnanam, Vetrivel, & Raju, 2016).

The new technology named ICT is to be accepted and used in teaching-learning process as it is a new paradigm of the teaching-learning process. It aims at transferring the old traditional paradigm of learning to meet the new paradigm of learning. It empowers both the teachers and learners in making significant contributions to learning and achievement (Talawar, 2011). Further, ICT enables the teachers to collect up to date and complete information and to get classification on any topic from experts and teachers of various institutions exchanging their ideas and views through the use of ICT tools and resources (Mythili, 2011).

1.2.0   Teaching- Learning Process

Teaching refers to either occupation or profession of a group known as teachers, or an activity or activities of a group, undertaken to help an individual to

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learn or to acquire some knowledge, skills, attitudes or interests. Teaching is accompanied or followed by learning. In other words, when there is teaching, learning takes place. Thus, learning is a focal point of the teaching-learning process. The behavior of an individual is changed through direct or indirect experiences in learning. Learning involves new ways of doing things and adjustment to a new situation. It represents progressive changes in behaviour to satisfy interests to attain a goal.

Teaching- learning process involves both the teacher and the learner. In one side is the teacher and in another side is the learner. Thus, teaching-learning is a two-way process. The process again involves assessment of learning needs, establishment of specific learning objectives, development of teaching and learning strategies, implementation of plan of work and evaluation of the outcomes of the instruction. Teaching- learning has an intimate relationship on account of serving the same goal, bringing the desired modification in the behaviour of the learners (Mangal & Mangal, 2010).

1.3.0   Background of the Study

The present research took place in government colleges in Aizawl city. At the time of the study, there were 11 colleges run and managed by government of Mizoram in Aizawl city out of which 8 were colleges offering general undergraduate courses. The rest 3 colleges namely, Mizoram Law College (MLC), Institute of Advanced Study in Education (IASE) and Mizoram Hindi Training College (MHTC) were professional colleges offering law and teacher education courses. Directorate of

Higher and Technical Education, Government of Mizoram is directly responsible for administration of the colleges at the state level. The background of the government colleges in Aizawl city is depicted in the following table:

Table 1.1.0
Background of Government Colleges in Aizawl City

Sl. No	Name of Colleges	Year of Establishment	Affiliation & Accreditation	Courses Offered
1	Govt. Aizawl College	1975	Affiliated to Mizoram University and accredited by NAAC	BA & B.Com
2	Govt. Aizawl West College	1990	-do-	BA
3	Govt. Aizawl North College	1988	-do-	BA
4	Govt. Hrangbana College	1980	-do-	BA & B.Com
5	Govt. Johnson College	1993	-do-	BA
6	Govt. J.Thankima College	1992	-do-	BA
7	Govt. T.Romana College	1992	-do-	BA
8	Govt. Zirtiri Residential Science College	1980	-do-	B.C.A. B.Sc B.H.Sc.
9	Government Mizoram Law College	1983	-do- Recognized by Bar Council of India	LL.B
10	Institute of Advanced Study in Education (IASE)	1975	Affiliated to Mizoram University. Accredited by NAAC. Recognized by NCTE	B.Ed. M.Ed. M.Phil. & Ph.D. in Education
11	Mizoram Hindi Training College	1975	Affiliated to Central Institute of Hindi (CIH), Mizoram. Accredited by NAAC Recognized by NCTE	B.Ed D.EL.ED

As shown by the above table, the three oldest government colleges located in Aizawl city are Government Aizawl College, IASE and Mizoram Hindi Training College which were established in the year 1975 under different names from the existing ones. The next oldest colleges are Government Hrangbana College and Government Zirtiri Residential Science College which were established in 1980 as private colleges. Mizoram Law College started in 1983 is the third oldest college followed by Government Aizawl North College started in 1988. The youngest college is Government Johnson College started in 1993 and Government J. Thankima College and Government T. Romana College are the second youngest colleges established in 1992.

All the colleges except Mizoram Hindi Training College are affiliated to Mizoram University and all the colleges are accredited by NAAC. The three professional colleges are with recognition from their respective regulatory bodies. Mizoram Law College obtains recognition from Bar Council of India and both the teacher education institutions namely IASE and Mizoram Hindi Training College get the recognition of NCTE.

While IASE offer B.Ed., M.Ed. and, M.Phil. and Ph.D. in Education programmes, MHTC offer B.Ed. (Hindi) and D.El.Ed. (Hindi) programmes. All the 8 general colleges except Government Zirtiri Residential Science College offer Bachelor of Arts (BA) programme and two colleges namely Government Aizawl College and Government Hrangbana College offer commerce stream (B.Com.) of study in addition to art stream of study.

1.4.0   Rationale of the Study

With the advancement in information and communication technology, the world today has become a world of digital communication. Everybody, young or old, educated or uneducated, is affected positively or negatively by digital communication technology. ICT is a boon or a bane depending upon the way it is used. There are many instances when children, youths, adults, students and teachers misuse ICT or do not use it as it should be. It is, thus, necessary to make everybody aware of the negative effects of the misuse of ICT as well as the positive effects of proper use of it. Both teachers and students need to be made aware of various information technologies and their uses in the field of education. In this regard, teachers' responsibility is higher than that of the students. It is the teachers' responsibility to update their knowledge and skills in using ICT to make the fullest utilization of recent technological advancements and resources available. With changing teaching methods in curriculum transactions, teachers need to leave their apprehensions behind technology-mediated instruction and need to employ new technologies. Policy makers and educational administrators are responsible to redesign and reconstruct their views and ideas upon the educational systems, based on the new educational paradigms in this digital age. Most countries around the world are focusing on approaches to integrate ICT in teaching-learning to improve the quality of education by emphasizing competencies such as critical thinking, decision-making, and handling of dynamic situations, working as a member of a team and communicating effectively (Anderson & Weert, 2002). (Padmavathi, 2013).

The UGC in its 532nd meeting held on 24.5.2018 approved the objectives set for improving the quality in higher education institutions (HEIs) through its Notices-166 on *'Quality Mandate for improving quality in higher education'* which was published in the UGC website on 4.6.2018. All HEIs shall strive to achieve the objectives by 2022 in which initiatives shall be undertaken to pursuit the use of ICT-based learning tools for an effective teaching-learning process (Ramganesh, 2011).

The traditional approaches and methods of teaching-learning have witnessed a reformative transformation and its place is occupied by ICT tools such as online smart-boards, projectors, laptops, android systems, PCs, online lectures, tablets, cellular phones, e-readers, web resources and, other software and hardware devices. Education satellites have made its stake in the process of teaching-learning and evaluation. The use of ICT tools and resources is highly increased in recent years (Sawant, 2015).

As the world is progressing fastly in the integration of ICT in education, what is the position of Mizoram is a question that comes to the mind of the present investigator. Some more issues that need to be addressed are:

1) ICT resources and facilities that are made available in government colleges in Aizawl city, the capital of Mizoram state.

2) The extent to which ICT resources available in government colleges in Aizawl city are utilized for teaching-learning purpose.

3) Teachers' and students' perceptions about the use of ICT in teaching-learning process of government colleges in Aizawl city.

4)   Problems faced by teachers and students of government colleges in Aizawl city in the use of ICT in teaching-learning process.

To address the issues raised above, undertaking a research is felt necessary. Thus, an attempt has been made to conduct a study in the area of ICT in education at higher education level.

1.5.0. Statement of the Problem

The present study focuses on the ICT resources available in government colleges in Aizawl city, the capital of Mizoram and the utilization of those resources by teachers in imparting education. To validate the study, perceptions of the teachers and students of the colleges about the use of those resources in education are also covered. The study also explores the problems encountered by the teachers and students in this regard. The problem of the present study is thus stated as "ICT in Teaching-Learning Process of Government Colleges in Aizawl City: Status and Problems".

1.6.0   Operational Definitions of Key Terms Used

The key terms used in the title of the present study are operationally defined as follow:

ICT: In the present study, ICT stands for Information and Communication Technology and refers to technological tools and resources used to create, store, manage, disseminate and communicate information to the learners and that are used in teaching-learning process.

Teaching-Learning Process: The term 'Teaching - Learning Process' in the present study implies a process of delivery and dissemination of information to the learners in an educational setting to bring about desired changes in the students.

Government Colleges in Aizawl City: The term 'Government Colleges in Aizawl City' refers to colleges run and managed by the Government of Mizoram located in Aizawl city, the capital of Mizoram and offering general undergraduate courses of studies such as arts, science and commerce.

1.7.0 Objectives of the Study

Objectives of the present study are as under:

1) To find out the ICT resources available in government colleges in Aizawl city.

2) To study the extent to which ICT resources are used in teaching-learning process of government colleges in Aizawl city.

3) To study the perception of teachers about the use of ICT in teaching-learning process of government colleges in Aizawl city.

4) To study the perception of students about the use of ICT in teaching-learning process of government colleges in Aizawl city.

5) To study the problems faced by teachers of government colleges in Aizawl city in the use of ICT in teaching-learning process.

6) To study the problems faced by students of government colleges in Aizawl city in the use of ICT in teaching-learning process.

7) To suggest some measures for improvement in the use of ICT in teaching - learning process of government colleges in Aizawl city.

1.8.0. Organization of the Report

The report of the study has been organized as given below:

Chapter I is introduction. The study has been introduced with sub-headings such as ICT in education, teaching-learning process and background of the study. The chapter also presents rationale of the study, statement of the problem, objectives of the study, operational definitions of key terms used and organization of the report.

Chapter II is about review of related studies. Some studies conducted in the field of ICT in the country and abroad are briefly reviewed. The chapter is concluded with relevance of the review for the present study.

Chapter III is on methodology of the study. It briefly describes the research approach, population and sample, construction of tools, tabulation of data and statistical treatment of data.

In Chapter IV, data presented in tables are analyzed and interpreted wherever possible. Arrangement, analysis and interpretation of the data are made based on the objectives of the study.

In Chapter V, major findings are presented. Discussion of findings and their implications, recommendations for improvement of ICT in teaching-learning process of colleges in Aizawl city and suggestions for further studies are also given.

CHAPTER – II

REVIEW OF RELATED STUDIES

CHAPTER II

REVIEW OF RELATED STUDIES

2.1.0 Introduction

The present chapter is devoted to review of related studies. Researches already conducted in India and abroad in the area of ICT in education are briefly reviewed and presented in chronological order as under:

2.2.0 Related Studies Reviewed

Kong, Au and Pun (2000) studied school information technology pilot scheme from the perspective of possibilities of creative and lifelong learning. The effect of using IT in learning and teaching was dealt with. The findings were:

 (i)   some schools optimized students' opportunities for accessing the computing and networking capabilities.

 (ii)   acquiring a LCD projector in each general classroom was an important part of the IT infrastructure for promoting the use of IT in schools.

 (iii) all the primary schools under study motivated teachers to use IT to improve the traditional mode of learning and teaching by developing multimedia-teaching unit.

Angeli (2005) carried out a study on transforming a teacher education method course through technology in which an instructional design model was employed in a science education method course, which was offered in two different but consecutive

semesters. Using multimedia authoring tool in the fall semester and modelling software in the spring semester, teacher educators designed high quality technology-infused lessons for science and, thereafter, modelled them in classroom for pre-service teachers. An assessment instrument was constructed to assess pre-service teachers' technology competency. The results of a MANOVA implies that pre-service teachers in the Modelling group outperformed pre-service teachers' overall performance in the Multimedia group, $F = 21.534$, $p = 0.000$. More specifically, the Modelling group outperformed the Multimedia group on only two of the four aspects of technology competency, namely, use of technology to support teaching strategies and integration of computer activities with appropriate pedagogy in the classroom, $F = 59.893$, $p = 0.000$, and $F = 10.943$, $p = 0.001$ respectively. The result indicated that the task of preparing pre-service teachers to become technology competent was difficult and requires many efforts for providing them with ample opportunities during their education to develop the competencies needed to be able to teach with technology.

Nouri and Shahid (2005) studied the effect of PowerPoint presentations on student learning and attitudes. The study reported that PowerPoint presentation might improve student attitudes toward the instructor and class presentation. However, the results did not provide conclusive evidence that PowerPoint presentations improved short-term or long-term memory.

Hennessy, Ruthven and Brindley (2007) studied teacher perspectives on integrating ICT into subject teaching. They found that evident commitment to incorporating ICT was tempered by a cautious, critical approach, and by the influence of external constraints. Teachers emphasized both the use of ICT to enhance and extend existing classroom practice. Teachers developed and trialed new strategies specifically for mediating ICT supported learning.

Stensaker, Maassen, Borgan, Oftebro and Karseth (2007) analyzed the use, updating and integration of ICT in higher education in five Norwegian universities and colleges. The analysis disclosed that Norwegian higher education institutions often had adequate economic resources and a rather well developed technical infrastructure and support structure related to the use of ICT. However, attempts to link ICT initiatives to organizational development issues and to human resource management had not been very successful. The study made a conclusion that pedagogical issues and organizational and human development aspects must be better linked if ICT was to play a more effective role in teaching and learning in Norwegian higher education.

Hsu and Hwang (2008) investigated the effects of school size on science and mathematics teachers' adoption of technology in classrooms. The study revealed that teachers at small schools were more likely to use technology for instructional purposes, teachers at small schools tended to have positive attitudes toward technology use and that among users of educational technology in southern Taiwan,

teachers at small schools designed and used significantly more instructional activities with technology. The study also found that small schools provided a better environment for science and mathematics teachers to implement educational technology in instruction.

Yang (2008) in a case study 'examining university students' and academics' understandings of ICTs in higher education' tried to identify the perceptions of students and teachers of University of Tasmania (Launceston) about the impact of ICT on higher education. Findings from the study revealed that teachers' understandings did not match with the capacity of ICTs and therefore did not align with the goals and objectives of university inputs. While most of the students' views turned out to be more positive and receptive to the use of ICT for learning than teachers, their expressions seemed to be more uncertain or hesitant concerning their academic learning processes embedded with ICT.

Gulbahar and Guven (2008) surveyed on ICT usage and the perceptions of social studies teachers in Turkey. The study shed light on the use of ICT tools in primary schools in the social studies subject area, by considering various variables which affect the success of the implementation of the use of those tools. A survey was completed by 326 teachers who taught fourth and fifth grade at primary level. The results showed that although teachers were willing to use ICT resources and were aware of the existing potential, they were facing problems in relation to accessibility to ICT resources and lack of in-service training opportunities.

Qablan, Abuloum and Jamal (2009) studied effective integration of ICT in Jordanian schools analyzing pedagogical and contextual impediments in the science classroom. The results showed that some participants were using ICT creatively in their science teaching. However, despite considerable political pressure to increase ICT use in the classroom, most expressed frustration at the lack of ICT tools, support from the school, from the Ministry of Education, and from the surrounding community.

Bahr and Bahr (2009) in their study of technological barriers to learning, designing hybrid pedagogy to minimise cognitive load and maximise understanding found that ICTs provided great promise for the future of education. One of the great challenges was to develop the classrooms to make the most of these technologies for the benefit of student learning.

BelenSanchez, Marcos, Gozalez and Guanlin (2012) investigated in-service teachers' attitudes towards the use of ICT in classroom. A quasi-experimental study with one non-randomized study group (n=85) was also conducted using a pre-and post-test design with the purpose of searching for differences before and after training. Besides, 11 semi-structured interviews were carried out with the purpose of deepening into teachers' major motivations and beliefs. The results showed that teachers' attitudes towards ICT were highly positive but the use of them in class was scarce and it was subjected to innovative processes. Secondly, there were no

significant differences after instruction. Main conclusions indicated that new ways of teacher training need to be developed.

Padmavathi (2013) surveyed secondary school teachers' perceptions, competency and use of computers which was carried out among secondary school teachers working in Puducherry, India. Teachers' perception towards use of computer was found to be favorable. Age, gender, training in computers, teaching subject did not show significant difference in the teachers' perception on use of computers. However, the actual use of computer by teachers seems to differ significantly by age, gender, computer ownership, teaching subject, teachers' competency and training. It was concluded that home access to computers, skill training and competency of teachers are the main determinants of integration of ICT in school education.

Miima, Ondigi and Masivi (2013) studied teachers' perception about integration of ICT in teaching and learning of Kiswahili language in secondary schools in Kenya. The findings established that most Kiswahili teachers understood the benefit of integrating ICT in teaching and learning of Kiswahili language but they were not willing to adopt it due to various challenges

Lari (2014) examined the impact of using Powerpoint presentations on students' learning and motivation in secondary schools in Lar, in the south-east of Iran. The result showed that the experimental group did better than the control

group. A positive impact of powerpoint presentation was found which was significant at 0.05 level. The majority of learners who were exposed to powerpoint presentations in the classroom had positive attitudes towards the presentation. Teaching based on the use of technology had a significant positive effect on learners' scores.

Fanai (2014) investigated the usage of ICT among the B.Ed students of IGNOU and found that mobile phone and television were possessed by 92%-100% and the percentage using computer was also found to be very high i.e, 80%-98%. The percentage of teachers using ICT in classroom teaching was extremely low. The major reason for not using computer in teaching was unavailability of computer facilities.

Makura (2014) conducted a study on 'students' perceptions of the use of ICT in higher education teaching and learning context: the case of a South African university'. Results showed that students perceived 'technology for learning' to mean a computer. They were satisfied with its use and functionality since commencing their studies. Students also reported that most lecturers did not use ICT for teaching.

Shifflet andWeilbacher (2015) studied teachers' beliefs and their influence on technology use to examine the complexities and contradictions of ways teachers perceive and implement technology in a seventh-grade social studies class. The study reported that although teachers *believed* that technology could be used to help engage

students in thinking critically to promote self-regulated learning and improve literacy skills, such beliefs did not always come to fruition in actual classroom practice.

Ghavifekr and Rosdy (2015) examined the effectiveness of ICT integration in school. It was found that teachers' well-equipped preparation with ICT tools and facilities was one of the main factors for success of technology-based teaching and learning. Professional development training programs for teachers also played a key role in enhancing students' quality learning.

Khan (2015) examined emerging conceptions of ICT-enhanced teaching in Australia. Through the study, five conceptions of ICT- enhanced teaching emerged: to meet external expectations, to gain access to information and resources, as a delivery tool, a media for active learning, and to prepare students for their future profession. Likewise, four dimensions of variation were explored to establish relationship among the categories of conceptions, namely: the role of the teachers, the role of the students, and the impact of technology on student and teacher knowledge, and who benefit from the use of ICT in teaching. The findings highlighted new aspects of teaching in tertiary education.

The role of ICT in higher education in the 21st century was studied by Richard (2015) who highlighted the following:

(i)   the adoption and use of ICTs in education had a positive impact on teaching, learning, and research;

(ii)   ICT could affect the delivery of education and enable wider access to the same;

(iii)   it would increase flexibility so that learners could access the education regardless of time and geographical barriers in the 21st century;

(iv)   wider availability of best practices and best course material in education, which could be shared by means of ICT, can foster better teaching and improved academic achievement of students.

Anupama (2015) in a critical study of use of ICT in e-governance of higher education with special reference to colleges affiliated to North Maharashtra University and University of Pune found that there were many direct and indirect benefits in using the integrated system for the e-governance of the institutions. The direct benefits are better efficiency, security, transparency, relevancy, systematic flow of process, saving time of the faculties which can be utilized for constructive work. The indirect advantages are that it helps in faster decision making, creates better brand image and upgrades individual profile.

Lu, Tsai and Wu (2015) surveyed the role of ICT infrastructure in its application to classrooms for middle and primary schools in China. Based on stepwise regression analysis, the study revealed that ICT infrastructure had different influences on its application for schools in urban and rural areas. ICT infrastructure was found to play insignificant role in "utilization of multi-media classrooms" or

"proportion of ICT aided courses" in city schools, and thus its role in city schools should be reinterpreted.

Gebremedhin and Fenta (2015) assessed teachers' perception about integrating ICT in teaching learning process of Adwa College. The result on hardware and software usage showed that majority of teachers in the college were unable to use hardware in teaching learning process mainly due to shortage of resources. Teachers who could not use ICT as instructional tool were 55.6 percent higher than those who could use it. The results indicated the following:

a) most teachers in the college did not integrate ICT in the course they taught;

b) Adwa College was poor in preparation of ICT trainings;

c) encouraging technology was important to apply ICT in teaching-learning process;

d) the teachers had strong positive perception to use of ICT in teaching- learning process;

e) the teachers' perception towards ICT integration into teaching-learning process increases when ICT usage was encouraged and vice versa;

f) the teachers' productiveness was realized when ICT was integrated to the course they taught;

g) one of the barriers to technology implementation was lack of teachers' technical knowledge and shortage of resources.

Alam (2016) studied use of ICT in higher education and found that ICT integration was a crying need for capacity building efforts of educational institutions. With all parameters it acted as a change agent in education and society by promoting a proper balance between content generations and research in critical areas. Therefore it was pertinent to pay attention to the ICT implementation in educational system for imparting easily accessible, affordable and quality higher education.

Bindu (2016) in his impact study of ICT on teaching and learning reviewed literature and found that the advent of ICT in education helped to improve the quality of education where teaching and learning eventually became an engaging active process related to real life. Active and collaborative learning conditions facilitated by ICT helped develop a knowledge-based student community.

Chuaungo (2017) studied the use of ICT among the students and teachers of B.Ed programme of IASE in Mizoram. Findings are:

a) While 50 per cent of B.Ed students reported that their teachers very often used power point presentation in teaching, only 40 per cent of the teachers themselves reported the same.

b) Teachers were found uncomfortable in using ICT by 27 per cent of the students.

c) Besides ICT teacher, no other teacher gave specific instruction to the students on how to prepare and use powerpoint presentation.

d) There was only a limited and minimal development of ICT skills and confidence in the students.

e) Majority of the students could demonstrate their ICT skills during practicum.

f) Whatsapp was the online tool used by large majority of the teachers to communicate with their students

g) Inadequate facilities and equipments, irregularity of internet access, inadequate number of ICT experts in the institution were barriers in the use of ICT as stated by the teachers.

Vanlalruati (2018) studied e-learning practices among the students of Mizoram University. The study was intended to find out the perceptions of students about e-learning, availability of e-resources, resources accessed by the students and purpose of e-learning. It was found that the students had no problem in handling and managing e-learning services. E-learning gave them in-depth knowledge and a better understanding of their academic area. The students found e-learning useful and interesting as they could work according to their own time and space. They also felt that e-learning improved the quality of their work – assignment, test, exam, practical, etc. and their work also became easier and smoother when compared with that of learning in traditional style. The study revealed that most students used internet for academic purposes.

2.3.0 Relevance of the Present Study in Relation to the Studies Reviewed

Review of related studies given above indicates that studies relating to ICT in education at different stages of education have been conducted in different countries. Some studies reviewed are focussed on use or integration of ICT in education, classrooms, schools, higher education etc. Some studies deal with usage of ICT among B.Ed students and teachers. There are studies focussing on perception or attitude of students and teachers at different levels of education towards integration of ICT in teaching learning. Some more studies concentrate on impact or effectiveness of ICT integration or use of ICT or powerpoint presentation on students learning.

Looking at the studies reviewed and the aspects of ICT covered by the studies, it is found that status of integration of ICT in teaching learning process in undergraduate colleges has not been covered. No study is found to have focussed on problems faced by college students and teachers with regard to the use of ICT in teaching learning process. Moreover, the only three studies that have been conducted in the state of Mizoram are confined to the use of ICT among B.Ed students of IGNOU, students and teachers of IASE and e-learning practices among the students of Mizoram University. Thus, not a single study has been conducted on status of ICT in teaching learning process of undergraduate colleges and problems encountered by the teachers and students. The review establishes the fact that the present study is not duplication of existing studies. It also helps the investigator in identifying the gaps in research in the area of ICT in education. The present study is an attempt to fill that identified research gap.

CHAPTER – III

METHODOLOGY OF THE STUDY

CHAPTER III

METHODOLOGY OF THE STUDY

3.1.0 Introduction

The present chapter describes the plan and procedure followed to carry out this study. Methodology of the study is outlined under the following heads.

- The research approach

- Population and sample

- Construction of tools

- Tabulation of data

- Statistical treatment of data

3.2.0 Research Approach

The present study adopted a descriptive research as it had to describe the status and problems related to ICT in teaching-learning process of government colleges in Aizawl city. For analysis of data collected for the present study, both qualitative and quantitative approaches were followed.

3.3.0 Population and Sample

Three types of population and sample were involved for the present study. These are:

i) *Population and Sample of Government Colleges in Aizawl City*: All the government colleges in Aizawl city offering arts, science and commerce

streams of studies formed population of the present study. The number of such colleges as in March, 2019 was 8 (eight). Sample selection was not done as the number of the colleges was small. Thus, all the 8 government colleges offering arts, science and commerce located in Aizawl city were covered in the study.

ii) *Population and Sample of Teachers*: All the arts, science and commerce teachers of government colleges in Aizawl city constituted the second group of population for the present study. There were 350 teachers (as per college office records as on 27th March.2019) which formed the population. A sample of 176 teachers comprising 50.29 per cent of the teachers in each college representing arts, science and commerce streams were selected by following random sampling method.

iii) *Population and Sample of Students*: Population of students for the present study comprised of all the students of government colleges in Aizawl city. There were 8523 students (enrolled as on 5th September. 2019) in government colleges in Aizawl city. In the first stage, purposive sampling technique was followed and that selection of sample students was restricted to 5th Semester as students at this stage were experienced enough to give proper judgement on whether their teachers properly use ICT in teaching-learning process or not. Thus, out of 2188 students of 5th Semester, a sample of 180 students comprising of 60 each from arts, science and commerce streams was selected by following random sampling method.

Population and sample distribution are presented in the following tables:

Table 3.1.0

Population of Government Colleges in Aizawl City Offering General Courses, Teachers and Students Therein

Sl. No	Name of Colleges	No. of Teachers (including part time and contract teachers)	Students enrolment	5th semester students
1	Govt. Aizawl College	55	1236	343
2	Govt. Aizawl West College	37	804	220
3	Govt. Aizawl North College	34	1227	334
4	Govt. Hrangbana College	65	1810	493
5	Govt. Johnson College	27	990	184
6	Govt. J. Thankima College	32	590	153
7	Govt. T. Romana College	36	1226	292
8	Govt. Zirtiri Residential Science College	64	640	169
	Total	350	8523	2188 (Arts: 1909 Science: 169 Commerce: 110)

Sample Distribution for the Study

Stream of Studies	Sample Teachers	Sample Students
Arts	135	60
Science	26	60
Commerce	15	60
TOTAL	176	180

3.4.0 Construction of Tools

The following tools constructed by the investigator were used for the present study:

1. Observation cum Interview Schedule for Principals for studying ICT resources available in government colleges in Aizawl city.

2. Questionnaire for Teachers for studying:

   a) The extent to which ICT resources are used in teaching - learning process

   b) Their perception about the use of ICT in teaching - learning process.

   c) The problems faced by them in the use of ICT in teaching-learning process.

3. Questionnaire for Students for studying:

   a) Their perception about the use of ICT in teaching - learning process.

   b) The problems faced by them in the use of ICT in teaching-learning process.

1.   Construction of Observation cum Interview Schedule

Observation cum Interview Schedule was constructed for studying ICT resources available in government colleges in Aizawl city. Information sheet was also prepared for recording and acquiring the required information from the respondents i.e. Principals. This Observation cum Interview Schedule has 12 items to be filled by the investigator after observation of the colleges and interview with Principals. Five out of the 12 items are with 4,4,9,4 and 2 sub items. The Schedule comprises of the following items selected based on the nature and objectives of the present study:

i.   Background information of the college with their e-mail, website provision and courses offered

ii.   Number of computers and laptops available and purposes of their use

iii.   ICT/Computer centre available for the colleges including amount of fund received and sources of fund, size and nature, and maintenance of the building, number of computers, seating capacity and working hours.

iv.   Equipment of classroom ICT facilities including Ceiling mount projector, portable LCD projector and laptop ready for use in the classroom

v.   Availability of wi-fi in the Campus

vi.   Availability of e-resources (e-books, e-journals) provided by INFLIBNET or any others

vii.   ICT training or other professional development conducted for the teachers

viii.   Internet connection details

ix.   ICT support at the institution

x.   ICT resources provided for teaching-learning process

xi.   Status of present ICT resources

xii.   Computer instructor at the institution

2.   Construction of Questionnaire for Teachers

A questionnaire was designed and divided into three parts. All the items were grouped under Part-I, II and III and numbered accordingly as suggested by the supervisor and experts.

Part I deals with the extent to which ICT resources are used in teaching - learning process and has 6 questions for the teachers. Two options Frequently and Rarely/or Never are provided for each item. Teachers are required to answer the questions by putting tick marks in the relevant brackets provided against items appearing under each question.

Part II deals with teachers' perception about the use of ICT in teaching - learning process. Teachers are required to answer the questions by putting a tick marks in the brackets against the responses provided for each question.

Part III is about the problems faced by teachers in the use of ICT in teaching-learning process. It contains 3 questions each having a number of multiple choice responses. Respondents are required to put tick marks in the relevant brackets against the problems faced by them under the heading severe or mild.

3.   Construction of Questionnaire for Students

The questionnaire for students is preceded by instruction to the respondents and personal information about them. It has two parts.

Part A: Questionnaire for studying students' perception about the use of ICT in teaching - learning process by the teachers has 4 main questions. Each question has multiple choice responses against which brackets are provided. Students are required to answer the questions by putting a tick mark against any possible response provided for each item.

Part B: Questionnaire for studying the problems faced by students in the use of ICT in teaching-learning process contains 3 main questions. Each question is followed by multiple choice responses revealing the possible problems encountered by the students. Respondents are required to mention whether the problems faced by them are severe or mild by putting tick marks in the spaces provided against each response.

3.5.0 Collection of Data

For the present study, primary data were collected from Principals, teachers and students of government colleges in Aizawl city as briefly described below:

i) The investigator visited all the government colleges in Aizawl city, gathered necessary information through observation and conducted an interview with principals of 8 government colleges in Aizawl city. While administering the Observation cum Interview Schedule, the investigator recorded her observation on ICT resources of the colleges and the principals on the questions or items relating to their ICT facilities.

ii) Data on the extent to which ICT resources were used by the teachers in teaching - learning process, teachers' perception about the use of ICT in

teaching - learning process and the problems faced by them in this regard were collected from teachers of the colleges. The investigator visited all the colleges under study and administered Questionnaire prepared for this purpose to sample teachers who had been randomly selected from arts, science and commerce streams.

iii) Data on students' perception about the use of ICT in teaching - learning process and the problems faced by them in the use of ICT in teaching-learning process were collected by administering the Questionnaire prepared for this purpose. The investigator, while visiting the colleges met the students in their respective classrooms, distributed the questionnaire and let them answer the questions.

3.6.0 Tabulation of Data

All the data collected through Observation Cum Interview Schedule and Questionnaire for teachers and students were calculated, organized, classified and tabulated in a systematic manner for analysis.

3.7.0 Statistical Treatment of Data

The data obtained were tabulated in terms of frequencies and percentages. Then, the results obtained were analysed both quantitatively and qualitatively. For quantitative analysis, simple statistical techniques such as frequencies and percentages were applied.

CHAPTER – IV

ANALYSIS AND INTERPRETATION OF DATA

CHAPTER IV

ANALYSIS AND INTERPRETATION OF DATA

The data collected for fulfilling objectives of the present study are analyzed and interpreted in this chapter. They are arranged in the following order:

4.1.0   The ICT Resources Available in Government Colleges in Aizawl City

4.2.0   The Extent to which ICT Resources are Used in Teaching - Learning Process of Government Colleges in Aizawl City

4.3.0   The Perception of Teachers about the use of ICT in Teaching - Learning Process of Government Colleges in Aizawl City

4.4.0   The Perception of Students about the Use of ICT in Teaching - Learning Process of Government colleges in Aizawl City

4.5.0   The Problems Faced by Teachers of Government Colleges in Aizawl City in the Use of ICT in Teaching - Learning Process

4.6.0   The Problems Faced by Students of Government Colleges in Aizawl City in the Use of ICT in Teaching - Learning process

4.1.0 The ICT Resources Available in Government Colleges in Aizawl City

Table – 4.1.1

Background Information of Government Colleges in Aizawl City in Terms of Email and Website

Sl. No	Name of College	Email Address	Web-site	
			website	Monitored by
1	Govt. Aizawl College	aizawlcollege75@ gmail.com	gac.ac.in	ICT Cell
2	Govt. Aizawl West College	govtaizawlwestcollege @gmail.com	www.gawc. edu.in	IT cell
3	Govt. Aizawl North College	govtanc.yahoo.com	https//:ganc. mizoram.gov.in	IQAC
4	Govt. Hrangbana College	hrangbanacollege2014 @gmail.com	Ghbc.edu.in	ICT committee
5	Govt. Johnson College	gjcmizoram@ gmail.com	Johnsoncollege. mizoram.gov.in	ICT Dept, Govt. of Mizoram
6	Govt. J.Thankima College	jthankimacollege@ rediffmail.com	www.jtc.edu.in	IQAC Cell
7	Govt. T. Romana College	trcollege@gmail.com	www.trcollege. edu.in	IT Cell
8	Govt. Zirtiri Residential Science College	contact@gzrc.edu.in	www.gzrc. edu.in	Website Committee

Table 4.1.1 presents background information of government colleges in Aizawl city providing their email addresses and websites. The table indicates that:

a) All the government colleges in Aizawl city have email addresses from which they can send letters, circulars, notifications, information etc. to others and receive the same from others.

b) All the government colleges in Aizawl city have their own websites through which each college can introduce itself to the public and post important notices, circulars and other important information to the public in general and the students in particular.

c) The websites are monitored by IT Cell of the colleges in the case of 2 government colleges namely, Govt. Aizawl West College and Govt. T. Romana College, IQAC of the college in Govt. Aizawl North College and Govt. J. Thankima College, ICT committee of the college in Govt. Aizawl college, ICT Department, Government of Mizoram and website committee of the college in the case of Govt. Aizawl College, Govt. Hrangbana College, Govt. Johnson College and Govt. Zirtiri Residential Science College respectively.

4.1.2 Computers and Laptops Available and the Purpose of Their Use in Government Colleges in Aizawl City

Table – 4.1.2

Computers and Laptops Available and the Purpose of Their Use in Government Colleges in Aizawl City

Sl. No	Name of College	Computers		Laptops	
		No.	Uses	No.	Uses
1	Govt. Aizawl College	66	Office Work, Teaching – Learning, Library, Language Lab, Lab for commerce, NIELIT & IGNOU, SU office	9	Lecture presentation/ Power-point presentation
2	Govt. Aizawl West College	70	Office Work, Classroom Teaching – Learning, Library, Language Lab, NIELIT Centre, SU office	8	Lecture presentation/ Power-point presentation
3	Govt. Aizawl North College	51	Office Work, Classroom Teaching – Learning, Library, Language Lab, Lab for commerce, NIELIT Centre,SU office	4	Lecture presentation/ Power-point presentation
4	Govt. Hrangbana College	108	Office Work, Classroom Teaching-Learning, Library, Language Lab, NIELIT&IGNOU, Geography lab, Psychology Lab, SU office	28	Lecture presentation/ Power-point presentation

5	Govt. Johnson College	46	Office Work, Classroom Teaching – Learning, Library, Language Lab, SU office	27	Lecture presentation/ Power-point presentation
6	Govt. J.Thankima College	60	Office Work, Classroom Teaching – Learning, Library, Language Lab, NIELIT Centre, SU office	10	Lecture presentation/ Power-point presentation
7	Govt. T.Romana College	59	Office Work, Classroom Teaching – Learning, Library, Language Lab, NIELIT Centre, SU office	15	Lecture presentation/ Power-point presentation
8	Govt. Zirtiri Residential Science College	60	Office Work, Classroom Teaching – Learning, Library, Language Lab, NIELIT Centre, SU office, Sience Laboratory, BCA	12	Lecture presentation / Power-point presentation Web-browsing collecting study materials

Table 4.1.2 presents number of computers and laptops available and the purpose of their use in government colleges in Aizawl city. The table indicates the following:

a) All the government colleges in Aizawl city have their own computers and laptops. In terms of the number of computers owned by them, Govt. Hrangbana College stands first with 108 computers seconded by Govt. Aizawl West College with 70 computers followed by Govt. Aizawl College with 66 computers and again by Govt. J. Thankima College and Govt. Zirtiri Residential Science College with 60 computers respectively. Govt. Johnson

College has the least number of computers ie., 46 followed by Govt. Aizawl North College and Govt. T. Romana College which are with 51 and 59 computers respectively.

b) All the government colleges in Aizawl city use the Computers for the purpose of office work, teaching-learning, library, language lab, and SU office. In addition to these, Govt. Hrangbana College uses computers for IGNOU centre, geography lab, psychology lab, Govt. Aizawl College uses computers for language lab, lab for commerce, NIELIT & IGNOU centre, and Govt. Zirtiri Residential Science College uses computers for science lab and BCA programme. Apart from these, Govt. Johnson College do not have NIELIT centre and do not use computers for this purpose.

c) On the number of laptops that the colleges have, it is Govt. Hrangbana College again that has the largest number of laptop, i.e., 28 followed by Govt. Johnson College that has 27 laptops. Govt. T. Romana College occupies the third position with 15 laptops, Govt. Zirtiri Residential Science College the fourth position with 12 laptops and Govt. J. Thankima College the fifth position with 10 laptops. Govt. Aizawl North College has only 4 laptops and Govt. Aizawl West College 8 and Govt. Aizawl College 9.

d) All the government colleges in Aizawl city use the laptops for the purpose of lecture presentation/ power-point presentation. Apart from this, Govt. Zirtiri Residential Science College uses laptops for web-browsing collecting study materials.

4.1.3 ICT/Computer Centres in Government Colleges in Aizawl City

Table – 4.1.3

ICT/Computer Centres in Government Colleges in Aizawl City

Sl. No	Particulars	Govt. Aizawl College	Govt. Aizawl West College	Govt. Aizawl North College	Govt. Hrangbana College	Govt. Johnson College	Govt. J.Thankima College	Govt. T.Romana College	Govt. Zirtiri Residential Science College
1	Separate building/ Room	No	No	No	No	No	No	No	Yes
2	Amount of fund received	15 Lakhs	10 Lakhs	8 Lakhs	15 Lakhs	10 Lakhs	10 Lakhs	10 Lakhs	10 Lakhs
3	Source of fund	UGC RUSA NEDP	UGC RUSA NEDP	UGC RUSA NEDP	UGC RUSA NEDP	UGC RUSA NEDP	UGC RUSA NEDP	UGC RUSA NEDP	UGC RUSA NEDP
4	Room provided to NIELIT to run computer centre	Yes	Yes	Yes	Yes	No	Yes	Yes	No
5	Size of the Room	15 X 24ft	24 X 28ft	15 X 20ft	15 X 24ft	-	15 X 24Ft	15 X 20Ft	15 X 20ft
	Seating capacity	30	20	20	30	-	30	25	18
6	No. of Computers in the Centre	30	20	20	30	-	30	25	20

Table 4.1.3 reveals the following:

a) No college in Aizawl city has separate building for ICT/computer centre. But Govt. Zirtiri Residential Science College has separate room for ICT/computer centre.

b) All the government colleges in Aizawl city received fund from UGC, RUSA and NEDP. The amount of fund Rs.15 lakhs is received by Govt. Aizawl College and Govt. Hrangbana College. The amount of fund Rs.10 lakhs is received by Govt. Aizawl West College, Govt. Aizawl North College, Govt. Johnson College Govt. J. Thankima College and Govt. Zirtiri Residential Science College. Govt. Aizawl North College receives Rs.8 Lakhs.

c) Only two colleges i.e., Govt. Johnson College and Govt. Zirtiri Residential Science College do not provide room for NIELIT to run computer centre and the rest government colleges in Aizawl city provide rooms for NIELIT to run computer centres in collaboration with the colleges. NIELIT offers CCC+ Certificate Course for students in all the rest government colleges in Aizawl city.

d) Sizes of the rooms provided for computer centre range from 15 X 20 ft. provided by Govt. Aizawl North College, Govt.T.Romana College and Govt. Zirtiri Residential Science College to 24 X 28 ft provided by Govt. Aizawl West College.

e) Seating capacity and number of computers in the centre as reported by the colleges is 30 each in Govt. Aizawl College, Govt. Hrangbana College and Govt. J. Thankima College, 25 in Govt. T. Romana College, 20 each in Govt.

Aizawl West College and Govt. Aizawl North College. Govt. Zirtiri

Residential Science College has 18 seating capacity.

4.1.4 ICT Facilities in the Classrooms of Government Colleges in Aizawl City

Table 4.1.4

ICT Facilities in the Classrooms of Government Colleges in Aizawl City

ICT Facilities	Govt. Aizawl College	Govt. Aizawl West College	Govt. Aizawl North College	Govt. Hrangbana College	Govt. Johnson College	Govt. J. Thankima College	Govt. T. Romana College	Govt. Zirtiri Residential Science College
No. of Ceiling Mount LCD Projector	16	17	7	18	15	10	12	14
No. of Portable LCD Projector	1	4	4	4	3	6	3	1
No. of Laptop for use in the classroom	9	8	4	28	27	10	15	12

Table 4.1.4 reveals the following:

a) Govt. Hrangbana College has the highest number of ceiling mount LCD projector i.e., 18, Govt. Aizawl West College has 17, Govt. Aizawl College 16, Govt. Johnson College 15, Govt. Zirtiri Residential Science College 14, Govt. T. Romana College 12, Govt. J. Thankima College 10 and Govt. Aizawl North College 7.

b) Govt. J. Thankima College has the highest number of portable LCD projector i.e., 6, Govt. Aizawl West College, Govt. Aizawl North College and Govt. Hrangbana College have 4 each, Govt. Johnson College and Govt. T. Romana College 3 respectively and lastly, Govt. Aizawl College and Govt. Zirtiri Residential Science College 1 respectively.

c) Again Govt. Hrangbana College has the highest number of laptop for use in the classroom i.e., 28. Govt. Johnson College has 27, Govt. T. Romana College 15, Govt. Zirtiri Residential Science College 12, Govt. J. Thankima College 10, Govt. Aizawl College 9, Govt. Aizawl West College 8 and Govt. Aizawl North College 4.

4.1.5   Wifi and E-Resources Available in Government Colleges in Aizawl City

Table 4.1.5

Wifi and E-Resources Available in Government Colleges in Aizawl City

Sl. No	Particulars	Govt. Aizawl College	Govt.Aizawl West College	Govt.Aizawl North College	Govt. Hrangbana College	Govt.Aizawl North College	Govt. J.Thankima College	Govt. T.Romana College	Govt.Zirtiri Residential Science College
1	Campus with free wifi	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	E-Resources	No	No	No	UGC N List	No	UGC N List	UGC N List	No
	No of ebooks	-	-	-	75 Titles	-	-	-	5000
	No of e-journals	-	-	-	55 + UGC N List	-	-	-	700
3	SOUL 2.0 Software	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	OPAC System used	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 4.1.5 indicates the following:

a) All the government colleges in Aizawl city provided their campus with Free wifi.

b) The UGC N-List is subscribed by Govt. Hrangbana College, Govt. J. Thankima College and Govt. T. Romana College to access e-journals. Govt. Hrangbana College has 75 titles of ebooks and 55+ journals. The number of e-books and e-journals as reported by Govt. Zirtiri Residential Science College is 5000 and 700 respectively. Govt. Aizawl College, Govt. Aizawl West College and Govt.Aizawl North College do not have reported e-resources.

c) SOUL 2.0 software is available in all the government colleges in Aizawl city and OPAC system is used by all the government colleges in Aizawl city.

4.1.6 Internet Facilities Provided to Government Colleges in Aizawl City

Table 4.1.6

Internet Facilities Provided to Government Colleges in Aizawl City

Sl. No	Name of College	BSNL Broadband	JIO Server	NETSURF	ZIPRO	Others
1	Govt. Aizawl College	Yes	Yes	No	No	-
2	Govt. Aizawl West College	Yes	Yes	No	-	-
3	Govt. Aizawl North College		-	-	Yes	-
4	Govt. Hrangbana College	Yes	Yes	-		-
5	Govt. Johnson College	-	-	-	-	National Infomatics Centre, Aizawl
6	Govt. J. Thankima College	Not reached by the server	Yes	Yes	No	No
7	Govt. T. Romana College	Yes	Yes	No	No	-
8	Govt. Zirtiri Residential Science College	Yes	Yes	-	-	-

Table 4.1.6 presents the internet facilities provided in government colleges in Aizawl city.

a) Govt. Aizawl College, Govt. Aizawl West College, Govt. Hrangbana College, Govt. T. Romana College and Govt. Zirtiri Residential Science College subscribe BSNL broadband and JIO server.

b) Govt. Aizawl North College subscribes ZIPRO.

c) National Infomatics Centre, Aizawl provides internet facilities to Govt. Johnson College.

d) Since the campus cannot be reached by BSNL Broadband, Govt. J. Thankima College subscribes JIO server and NETSURF.

4.1.7 ICT Instructor and Training on ICT in Government Colleges in Aizawl City

Table 4.1.7

ICT Instructor and Training on ICT in Government Colleges in Aizawl City

Sl. No	Name of College	The College has its own instructor	NIELIT provides the instructor	Training on ICT (in collaboration with NIELIT)
1	Govt. Aizawl College	Yes	-	Yes
2	Govt. Aizawl West College	-	Yes	Yes
3	Govt. Aizawl North College	-	Yes	Yes
4	Govt. Hrangbana College	-	Yes	Yes
5	Govt. Johnson College	-	-	Yes
6	Govt. J.Thankima College	Yes	-	Yes
7	Govt. T.Romana College	-	Yes	Yes
8	Govt. Zirtiri Residential Science College	-		Yes

Table 4.1.7 reveals the following:

a) Only two colleges, Govt. Aizawl College and Govt. J. Thankima College engage computer instructors/technicians from their own resources.

b) NIELIT provides ICT instructors in 4 Government Colleges namely, Govt. Aizawl West College, Govt. Aizawl North College, Govt. Hrangbana College, and Govt. T. Romana College .

c) In collaboration with NIELIT all the government colleges in Aizawl city has conducted training on ICT.

4.2.0 The Extent to which ICT Resources are Used in Teaching - Learning Process of Government Colleges in Aizawl City

Table 4.2.1

ICT Resources of Colleges Used by College Teachers for Preparation of Lectures

Sl. No	ICT resources	Total N=176		Arts teachers N=135		Science teachers N=26		Commerce teachers N=15	
		Frequently	Rarely/ never	Frequently	Rarely/ never	Frequently	Rarely/ never	Frequently	Rarely/ never
1	Desktop Computer	34 (19.32)	142 (80.68)	23 (17.04)	112 (82.96)	9 (34.62)	17 (65.38)	2 (13.33)	13 (86.67)
2	Laptop Computer	78 (44.32)	98 (55.68)	52 (38.52)	83 (61.48)	14 (53.85)	12 (46.15)	12 (80)	3 (20)
3	Printer /Scanner	81 (46.02)	95 (53.98)	50 (37.04)	85 (62.96)	20 (76.92)	6 (23.08)	11 (73.33)	4 (26.67)
4	Photocopier	68 (38.64)	108 (61.36)	46 (34.08)	89 (65.92)	15 (57.69)	11 (42.31)	7 (46.67)	8 (53.33)
5	Wifi in the campus	46 (26.14)	130 (73.86)	27 (20)	108 (80)	17 (65.38)	9 (34.62)	2 (13.33)	13 (86.67)

Figures in the parentheses indicate percentages

Table 4.2.1 reveals the following:

a) Majority of teachers of government colleges in Aizawl city rarely or never use ICT resources of the colleges namely: desktop computer (by 80.68%), e-resources (e-books, e-journals etc) (by 78.98%), wifi in the campus (by 73.86%), photocopier by (by 61.36%), laptop computer (by 55.68%), printer/scanner (by 53.98%) and pendrive (by 53.98%) of the college resources. Among the ICT resources of the colleges, printer/scanner and pendrive have equal percentages of highest frequent users (46.02% of teachers) followed by laptop computer having 44.32 percent of frequent users. The percentages of teachers who frequently use photocopier, pendrive, wifi in the campus, e-resources and desktop computer range from 19.32 per cent to 46.02 per cent.

b) Among teachers of different streams of study, science teachers are best users of ICT resources of colleges for preparation of lectures followed by commerce teachers and then by arts teachers as the percentages of frequent users are 52.75, 35.24 and 29.63 for science, commerce and arts teachers respectively.

c) ICT resources of colleges frequently used by majority of science teachers are printer/scanner (frequently used by 76.92%), wifi in the campus (by 65.38%), photocopier (by 57.69%), laptop computer (by 53.85%) and e-resources (by 53.85%).

d) Laptop computer and printer/scanner are frequently used by large majority of commerce teachers who constitute 80 per cent and 73.33 per cent respectively.

e) The percentages of arts teachers who frequently use ICT resources of colleges are quite low that they range from 16.29 to 38.52 per cent. Thus, majority of them rarely or never use the resources.

Table 4.2.2
Personal ICT Resources Used by College Teachers for Preparation of Lectures

Sl. No	Personal ICT resources	Total N=176		Arts teachers N=135		Science teachers N=26		Commerce teachers N=15	
		Frequently	Rarely/ never	Frequently	Rarely/ never	Frequently	Rarely/ never	Frequently	Rarely/ never
1	Desktop Computer	43 (24.43)	133 (75.57)	32 (23.71)	103 (76.29)	9 (34.62)	17 (65.38)	2 (13.33)	13 (86.67)
2	Laptop Computer	103 (58.52)	73 (41.48)	69 (51.11)	66 (48.89)	22 (84.62)	4 (15.38)	12 (80)	3 (20)
3	Printer	92 (52.27)	84 (47.73)	68 (50.37)	67 (49.63)	14 (53.85)	12 (46.15)	10 (66.67)	5 (33.33)
4	Tablet	18 (10.23)	158 (89.77)	12 (8.89)	123 (91.11)	6 (23.08)	20 (76.92)	0	15 (100)
5	Cellphone	71 (40.34)	105 (59.66)	52 (38.52)	83 (61.48)	12 (46.15)	14 (53.85)	7 (46.67)	8 (53.33)
6	Pendrive	77 (43.75)	99 (56.25)	56 (41.48)	79 (58.52)	13 (50)	13 (50)	8 (53.33)	7 (46.67)
7	Scanner	89 (50.57)	87 (49.43)	61 (45.19)	74 (54.81)	16 (61.54)	10 (38.46)	12 (80)	3 (20)
Total %		40.02	59.98	37.04	62.96	50.55	49.45	48.57	51.43

Figures in the parentheses indicate percentages

Table 4.2.2 reveals that:

a) Majority (59.98 %) of teachers of government colleges in Aizawl city rarely or never use their personal ICT resources namely: tablet (by 89.77%), desktop computer (by 75.57%), cellphone (by 59.66%), pendrive (by 56.25%), scanner (by 49.43%), printer (by 47.73%) and laptop computer (by 41.48%) for preparation of lectures. Laptop computer has the highest percentage of frequent users (58.52) among the personal ICT resources of the teachers followed by printer having 52.27 per cent and scanner 50.56 per cent frequent users. The percentages of teachers who frequently use tablet, desktop computer, cellphone, pendrive, printer, scanner and laptop computer range from 10.23 to 58.52 per cent.

b) Again, science teachers are the best users of personal ICT resources for preparation of lectures among teachers of different streams. The percentages of frequent users are 50.55 per cent in science teachers, 48.57 per cent in commerce teachers and 37.04 per cent in arts teachers.

c) Laptop computer are frequently used by large majority of science teachers (by 84.62%) and commerce teachers (by 80%) and 51.11 per cent by arts teachers.

d) Large majority of commerce teachers who constitute 80 per cent frequently used personal scanner for preparation of lectures.

Table 4.2.3
Softwares Used by College Teachers for Preparation of Teaching Materials

Sl. No	Softwares	Total N=176		Arts teachers N=135		Science teachers N=26		Commerce teachers N=15	
		Frequently	Rarely/ never	Frequently	Rarely/ never	Frequently	Rarely/ never	Frequently	Rarely/ never
1	Word Processors (Word etc.)	120 (68.18)	56 (31.82)	84 (62.22)	51 (37.78)	24 (92.31)	2 (7.69)	12 (80)	3 (20)
2	Spreadshe ets (Excel etc.)	28 (15.91)	148 (84.09)	11 (8.15)	124 (91.85)	7 (26.92)	19 (73.08)	10 (66.67)	5 (33.33)
3	Presentation Software (PowerPoint etc.)	74 (42.05)	102 (57.95)	46 (34.07)	89 (65.93)	13 (50)	13 (50)	15 (100)	0
4	Search Engines (google, yahoo etc)	104 (59.09)	72 (40.91)	74 (54.81)	61 (45.19)	20 (76.92)	6 (23.08)	10 (66.67)	5 (33.33)
5	CDs/DV Ds	2 (1.14)	174 (98.86)	0	135 (100)	2 (7.69)	24 (92.31)	0	15 (100)
6	Videos	8 (4.55)	168 (95.45)	6 (4.44)	129 (95.56)	2 (7.69)	24 (92.31)	0	15 (100)
7	Graphic charts	6 (3.41)	170 (96.59)	2 (1.48)	133 (98.52)	4 (15.38)	22 (84.62)	0	15 (100)

8	Websites	75 (42.61)	101 (57.39)	57 (42.22)	78 (57.78)	12 (46.15)	14 (53.85)	6 (40)	9 (60)
9	Internet	111 (63.07)	65 (36.93)	76 (56.29)	59 (43.71)	21 (80.77)	5 (19.23)	14 (93.33)	1 (6.67)
Total %		33.33	66.67	29.30	70.70	44.87	55.13	49.63	50.37

Figures in the parentheses indicate percentages

Table 4.2.3 presents the following:

a) Majority (66.67%) of teachers of government colleges in Aizawl city rarely or never use softwares for preparation of teaching materials namely, CDs/DVDs (by 98.86 %), videos (by 95.45%), graphic charts (by 96.59%), spreadsheets (excel etc.) (by 84.09%), presentation software (powerpoint etc.) (by 57.95%), websites (by 57.39 %), search engines (google, yahoo etc) (by 40.91%) ,internet (by 36.93%) and word processors (word etc.) (by 31.82%). Word processors (word etc.) which has the highest frequent users (68.18%). The percentages of teachers who frequently use CDs/DVDs, graphic charts, videos, spreadsheets (excel etc.), presentation software (powerpoint etc.), websites, search engines (google, yahoo etc) and internet range from 1.14 per cent to 63.07 per cent.

b) Commerce teachers are the best frequent users of softwares for preparation of teaching materials followed by science teachers and then again by arts teachers. The percentages are 49.63, 44.87 and 29.30 respectively.

Table 4.2.4
ICT Resources Used by College Teachers for Classroom Teaching-Learning Process

Sl. No	ICT resources for classroom teaching-learning process	Total N=176		Arts teachers N=135		Science teachers N=26		Commerce teachers N=15	
		Frequently	Rarely/never	Frequently	Rarely/never	Frequently	Rarely/never	Frequently	Rarely/never
1	Desktop Computer	11 (6.25)	165 (93.75)	6 (4.44)	129 (95.56)	4 (15.38)	22 (84.62)	1 (6.67)	14 (93.33)
2	Laptop Computer	78 (44.32)	98 (55.68)	49 (36.29)	86 (63.71)	17 (65.38)	9 (34.62)	12 (80)	3 (20)
3	LCD projector for powerpoint presentation	53 (30.11)	123 (69.89)	30 (22.22)	105 (77.78)	13 (50)	13 (50)	10 (66.67)	5 (33.33)
4	Ceiling Mount LCD projector for powerpoint presentation	47 (26.71)	129 (73.29)	30 (22.22)	105 (77.78)	8 (30.77)	18 (69.23)	9 (60)	6 (40)
5	Instructional Films (video,CD,V CD etc.)	9 (5.11)	167 (94.89)	7 (5.18)	128 (94.82)	2 (7.69)	24 (92.31)	0	15 (100)
Total %		22.50	77.50	18.07	81.93	33.85	66.15	42.67	57.33

Figures in the parentheses indicate percentages

Table 4.2.4 shows that:

a) Majority of teachers of government colleges in Aizawl city rarely or never use ICT resources for classroom teaching-learning (by 77.50% of teachers). Namely: Instructional films (video, CD, VCD etc.) (by 94.89%), desktop computer (by 93.75%), ceiling mount LCD projector for powerpoint presentation(by 73.29%). LCD projector for powerpoint presentation (by 69.89 %) and laptop computer (by 55.68 %). Laptop computer is the one which has highest frequent users in classroom teaching-learning by 44.32 per cent of teachers. The percentages of teachers who frequently use instructional films (video, CD, VCD etc.), desktop computer, ceiling mount LCD projector for powerpoint presentation and LCD projector for powerpoint presentation range from 6.25 to 30.11 per cent.

b) Commerce teachers are the best users of ICT resources in classroom by 42.67 percent of teachers, followed by 33.85 per cent of science teachers and 18.07 of arts teachers. While no single commerce teacher use instructional films (video, CD, VCD etc.) in classroom teaching-learning.

c) Only 18.07 per cent of arts teachers frequently use ICT resources for classroom teaching-learning. The percentages of teachers using different types of ICT resources for classroom teaching range from 4.44 to 36.29 per cent. This shows that majority of arts teachers rarely or never use ICT resources in classroom.

Table 4.2.5

ICT Resources Used by College Teachers for Teaching-Learning Process

Outside the Classrooms

Sl. No	ICT resources for outside classroom teaching-learning process	Total N=176		Arts teachers N=135		Science teachers N=26		Commerce teachers N=15	
		Frequently	Rarely/ never	Frequently	Rarely/ never	Frequently	Rarely/ never	Frequently	Rarely/ never
1	Language Laboratory	5 (2.84)	171 (97.16)	5 (3.71)	130 (96.29)	0	26 (100)	0	15 (100)
2	Science Laboratory	20 (11.36)	156 (88.64)		135 (100)	19 (73.08)	7 (26.92)	0	15 (100)

Figures in the parentheses indicate percentages

Table 4.2.5 reveals that:

a) Large majority of teachers of government colleges in Aizawl city rarely or never use language laboratory for outside classroom teaching-learning (by 97.16% of teachers). Only 2.84 per cent of teachers frequently use language laboratory which is form by 3.71 per cent of arts teachers.

b) Science laboratory are frequently used by science teachers for outside classroom teaching-learning (by 73.08 %).

c) Commerce teachers rarely or never use language laboratory.

Table 4.2.6

ICT Resources (online tools/instant messengers) Used by College Teachers for Maintaining Informal Teaching, Tutorial and Communication with Students

Sl. No	ICT resources (online tools/instant messengers)	Total N=176		Arts teachers N=135		Science teachers N=26		Commerce teachers N=15	
		Frequently	Rarely/ never	Frequently	Rarely/ never	Frequently	Rarely/ never	Frequently	Rarely/ never
1	Electronic Mail (E-Mail)	18 (10.23)	158 (89.77)	11 (8.15)	124 (91.85)	7 (26.92)	19 (73.08)	0	15 (100)
2	Facebook	6 (3.41)	170 (96.59)	6 (4.44)	129 (95.56)	0	26 (100)	0	15 (100)
3	Whatsapp Messenger	110 (62.5)	66 (37.5)	86 (63.71)	49 (36.29)	13 (50)	13 (50)	11 (73.33)	4 (26.67)
4	Instagram	8 (4.55)	168 (95.45)	4 (2.96)	131 (97.04)	0	26 (100)	4 (26.67)	11 (73.33)
5	Telegram	0	176 (100)	0	135 (100)	0	26 (100)	0	15 (100)
Total %		16.14	83.86	15.85	84.15	15.38	84.62	20	80

Figures in the parentheses indicate percentages

Table 4.2.6 reveals the following:

a) Majority of teachers of government colleges in Aizawl city rarely or never use online tools/instant messengers such as telegram, facebook, instagram and e-mail for maintaining informal teaching, tutorial and communication with students. Among the online tools/instant messengers, whatsapp messenger is the one which has highest frequent users (i.e. 62.5%). The percentages of teachers who frequently use facebook, instagram, electronic mail (e-mail) range from 4.54 to 10.23 per cent only.

b) Only 20 per cent of commerce teachers use ICT resources for maintaining informal teaching, tutorial and communication with students. Still, they are the better users of online tools/instant messengers when compared with arts and science teachers.

c) No single teacher in Aizawl city use telegram for maintaining informal teaching, tutorial and communication with students and no single teacher in science stream use facebook and instagram for such purpose.

d) The percentages of teachers who frequently use whatsapp messengers are 63.7 per cent of arts teachers, 73.33 per cent of commerce teachers and 50 per cent of science teachers. Thus, majority of teachers use whatsapp messengers for maintaining informal teaching, tutorial and communication with students.

4.3.1 The Perception of Teachers about the Use of ICT in Teaching - Learning Process of Government Colleges in Aizawl City

Table 4.3.1

Perception of College Teachers about the Utilization of ICT Resources of Colleges by the Teachers in Teaching - Learning Process

Sl. No	Perception	Total N=176	Arts teachers N=135	Science teachers N=26	Commerce teachers N=15
1	All teachers utilize ICT resources of the college	15 (8.52)	11 (8.15)	4 (15.38)	0
2	Most teachers utilize ICT resources of the college	60 (34.09)	42 (31.11)	11 (42.31)	7 (46.67)
3	Some teachers utilize ICT resources of the college	90 (51.14)	71 (52.59)	11 (42.31)	8 (53.33)
4	Few teachers utilize ICT resources of the college	11 (6.25)	11 (8.15)	0	0
5	None of the teachers utilize ICT resources of the college	0	0	0	0

Figures in the parentheses indicate percentages

Table 4.3.1 implies that:

a) Majority of teachers of government colleges in Aizawl city which constitutes 51.14 per cent perceive that some teachers utilize ICT resources of the college. The perception that most teachers utilize ICT resources of the college is held by only 34.09 per cent whereas only 8.52 per cent and 6.25 per cent find all teachers and few teachers respectively as utilizing the resources. There is not a single teacher who perceives that none of the teachers utilize ICT resources of the colleges.

b) Among arts teachers, the percentage of them who perceives that some teachers utilize ICT resources of the college is highest i.e. 52.59 per cent.

c) Equal percentages of science teachers i.e. 42.31 per cent each perceive that most teachers and some teachers utilize ICT resources of the colleges.

d) Majority of commerce teachers i.e. 53.33 per cent find some teachers as utilizing ICT resources of the college. Another 46.67 per cent also perceive most teachers as utilizing ICT resources of the colleges.

Table 4.3.2

Perception of College Teachers about the Utilization of Personal ICT

Resources by the Teachers in Teaching - Learning process

Sl. No	Perception	Total N=176	Arts teachers N=135	Science teachers N=26	Commerce teachers N=15
1	All teachers utilize personal ICT resources	17 (9.66)	11 (8.15)	6 (23.08)	0
2	Most teachers utilize personal ICT resources	71 (40.34)	48 (35.55)	17 (65.38)	6 (40)
3	Some teachers utilize personal ICT resources	71 (40.34)	59 (43.71)	3 (11.54)	9 (60)
4	Few teachers utilize personal ICT resources	17 (9.66)	17 (12.59)	0	0
5	None of the teachers utilize personal ICT resources	0	0	0	0

Figures in the parentheses indicate percentages

Table 4.3.2 reveals that:

a) Equal percentages of teachers of government colleges in Aizawl city i.e. 40.34 each perceive that most and some teachers utilize personal ICT resources. Again, equal percentages of teachers i.e. 9.66 find all and few

teachers utilize personal ICT resources. There is not a single teacher who perceives that none of the teachers utilize personal ICT resources.

b) The largest number of arts teachers constituting 43.71 per cent perceive that some teachers utilize personal ICT resources.

c) Majority of science teachers i.e. 65.38 per cent perceive that most teachers utilize personal ICT resources.

d) Majority of commerce teachers i.e. 60 per cent perceive that some teachers utilize personal ICT resources.

Table 4.3.3

Perception of College Teachers about the Use of Powerpoint Presentation by the Teachers for Classroom Teaching

Sl. No	Perception	Total N=176	Arts teachers N=135	Science teachers N=26	Commerce teachers N=15
1	All teachers use powerpoint presentation for classroom teaching	3 (1.70)	3 (2.22)	0	0
2	Most teachers use powerpoint presentation for classroom teaching	57 (32.39)	31 (22.96)	18 (69.23)	8 (53.33)
3	Some teachers use powerpoint presentation for classroom teaching	95 (53.98)	83 (61.48)	8 (30.77)	4 (26.67)
4	Few teachers use powerpoint presentation for classroom teaching	21 (11.93)	18 (13.34)	0	3 (20)
5	None of the teachers use powerpoint presentation for classroom teaching	0	0)	0	0

Figures in the parentheses indicate percentages

Table 4.3.3 reveals that:

a) Majority of teachers of government colleges in Aizawl city which constitutes 53.98 per cent perceive that some teachers use powerpoint presentation for classroom teaching. The perception that all teachers use powerpoint presentation for classroom teaching is held only by 1.70 per cent whereas only 32.39 and 11.93 per cent find most and few teachers as using powerpoint presentation for classroom. There is not a single teacher who perceives that none of the teachers use powerpoint presentation for classroom teaching.

b) Among arts teachers, those who perceive that some teachers use powerpoint presentation for classroom teaching is largest in number which constitutes 61.48 per cent. Majority of science teachers constituting 69.23 per cent perceive that most teachers use powerpoint presentation for classroom teaching.

c) The perception that most teachers use powerpoint presentation for classroom teaching is held by majority of commerce teachers i.e. 53.33 per cent.

Table 4.3.4

Perception of College Teachers about the Benefits of Powerpoint Presentation for Classroom Teaching

Sl. No	Perception	Total N=176	Arts teachers N=135	Science teachers N=26	Commerce Teachers N=15
1	Powerpoint presentation helps a lot in the teaching-learning process	157 (89.21)	121 (89.63)	23 (88.46)	13 (86.67)
2	Powerpoint presentation is of little help in the teaching-learning process	19 (10.79)	14 (10.37)	3 (11.54)	2 (13.33)
3	Powerpoint presentation does not help in the teaching-learning process	0	0	0	0

Figures in the parentheses indicate percentages

Table 4.3.4 shows that:

a) Large majority of teachers of government colleges in Aizawl city which constitutes 89.21 per cent perceive that powerpoint presentation helps a lot for classroom teaching. The perception that powerpoint presentation is of little help in the teaching-learning process by only 10.79 per cent. There is no teacher who perceives that powerpoint presentation does not help in the teaching-learning process.

b) Large majority of arts teachers i.e. 89.63 per cent, science teachers i.e. 88.46 per cent, commerce teachers i.e. 86.67 per cent perceive that powerpoint presentation in the classroom helps a lot in the teaching-learning process. Thus, majority of teachers of government colleges in Aizawl city find powerpoint presentation as helping a lot in the teaching-learning process.

Table 4.3.5

Perception of College Teachers about

Online Tools Most Popularly Used by College Teachers for Communicating

with the Students for Educational Purpose

Sl. No	Perception of college teachers about the use of Online Tools most Popular Used	Total N=176	Arts teachers N=135	Science teachers N=26	Commerce teachers N=15
1	Electronic Mail (E-Mail)	7 (3.98)	4 (2.96)	2 (7.69)	1 (6.67)
2	Facebook	0	0	0	0
3	Whatsapp Messenger	169 (96.02)	131 (97.04)	24 (92.31)	14 (93.33)
4	Instagram	0	0	0	0
5	Telegram	0	0	0	0

Figures in the parentheses indicate percentages

Table 4.3.5 shows:

a) As many as 96.02 per cent of government colleges in Aizawl city perceive that among online tools, whatsapp messenger is the most popularly used tool for communicating with the students for educational purpose. There is no single teacher who perceive that facebook, instagram and telegram popularly used by the teachers.

b) Only 3.98 per cent of the teachers perceive e-mail as popularly used by the teachers for the said purpose.

c) There is no teacher who perceive facebook, instagram and telegram as popularly used by the teachers themselves for educational purpose.

d) The percentage of arts, science and commerce teachers who perceive whatsapp messengers as the most popularly used online tool for communicating with the students for educational purposes are very high that the range is from 92.31 to 97.04 per cent.

4.4.0 The Perception of Students about the Use of ICT in Teaching - Learning Process of Government Colleges in Aizawl City.

Table 4.4.1

Perception of College Students about the Utilization of ICT Resources of Colleges by the Teachers in Teaching - Learning Process

Sl. No	Perception	Total N=180	Arts students N=60	Science students N=60	Commerce students N=60
1	All teachers utilize ICT resources of the college	19 (10.56)	3 (5)	8 (13.33)	8 (13.33)
2	Most teachers utilize ICT resources of the college	65 (36.11)	15 (25)	27 (45)	23 (38.34)
3	Some teachers utilize ICT resources of the college	78 (43.33)	28 (46.67)	23 (38.34)	27 (45)
4	Few teachers utilize ICT resources of the college	18 (10)	14 (23.33)	2 (3.33)	2 (3.33)
5	None of the teachers utilize ICT resources of the college	0	0	0	0

Figures in the parentheses indicate percentages

Table 4.4.1 reveals the following:

a) Many students of government colleges in Aizawl city i.e. 43.33 per cent perceive that some teachers utilize ICT resources of the college. The perception that all teachers utilize ICT resources of the college is held by only 10.56 per cent whereas 36.11 and 10 per cent find that most and few teachers utilize ICT resources of the college. There is not a single student who perceive that none of the teachers utilize ICT resources of the college.

b) The highest percentage of arts and commerce students (46.67% and 45% respectively) have the perception that some teachers as utilizing ICT resources of the college in teaching-learning process while this was so, the highest percentage (45%) of science students perceive most teachers as utilizing ICT resources of the college in teaching-learning process.

c) There is no student who hold the perception that none of the teachers utilize ICT resources of the college.

Table 4.4.2

Perception of College Students about the Use of Powerpoint Presentation by the Teachers for Classroom Teaching

Sl. No	Perception	Total N=180	Arts students N=60	Science students N=60	Commerce students N=60
1	All teachers use powerpoint presentation for classroom teaching	56 (31.11)	10 (16.66)	29 (48.33)	17 (28.33)
2	Most teachers use powerpoint presentation for classroom teaching	83 (46.11)	25 (41.67)	15 (25)	43 (71.67)
3	Some teachers use powerpoint presentation for classroom teaching	41 (22.78)	25 (41.67)	16 (26.67)	0
4	Few teachers use powerpoint presentation for classroom teaching	0	0	0	0
5	None of the teachers use powerpoint presentation for classroom teaching	0	0	0	0

Figures in the parentheses indicate percentages

Table 4.4.2 shows that:

a) There are 46.11 per cent of students of government colleges in Aizawl city who perceive that most teachers use powerpoint presentation for classroom teaching. The perception that 'all teachers use powerpoint presentation' is held by only 31.11 per cent and 'some teachers use powerpoint presentation for classroom teaching' find by 22.78 per cent. There is not a single student who perceives that few and none of the teachers use powerpoint presentation.

b) While 41.67 per cent of arts students hold the perception most teachers use powerpoint presentation for classroom teaching, another 41.67 per cent of them perceive some teachers as using powerpoint presentation in classroom teaching.

c) Among science students, the percentage of them who perceive that all teachers use powerpoint presentation in classroom teaching is highest which constitutes 48.33 per cent.

d) Majority of commerce students i.e. 71.67 per cent find that most teachers use powerpoint presentation for classroom teaching.

Table 4.4.3

Perception of College Students about the Benefits of Powerpoint Presentation

Done by the Teachers for Classroom Teaching

Sl. No	Perception	Total N=180	Arts students N=60	Science students N=60	Commerce students N=60
1	Powerpoint presentation helps a lot in the teaching-learning process	143 (79.44)	43 (71.67)	50 (83.33)	50 (83.33)
2	Powerpoint presentation is of little help in the teaching-learning process	37 (20.56)	17 (28.33)	10 (16.67)	10 (16.67)
3	Powerpoint presentation does not help in the teaching-learning process	0	0	0	0

Figures in the parentheses indicate percentages

Table 4.4.3 reveals that:

a) Majority of students of government colleges in Aizawl city which constitutes 79.44 per cent perceive that powerpoint presentation helps a lot in the teaching-learning process.

b) The percentage of them who perceive that powerpoint presentation is of little help in the teaching-learning is only 20.56 per cent.

c) There is not a single student who perceives that powerpoint presentation does not help in the teaching-learningprocess.

d) The percentages of arts, science and commerce students who perceive that powerpoint presentation as helping a lot in the teaching-learning process are as high as 71.67, 83.33 and 83.33 respectively.

Table 4.4.4

Perception of College Students about Online Tools Most Popularly Used by College Teachers for Communicating with the Students for Educational Purpose

Sl. No	Perception of college students about the use of online tools	Total N=180	Arts students N=60	Science students N=60	Commerce students N=60
1	Electronic Mail (E-Mail)	12 (6.67)	3 (5)	9 (15)	0
2	Facebook	0	0	0	0
3	Whatsapp Messenger	168 (93.33)	57 (95)	51 (85)	60 (100)
4	Instagram	0	0	0	0
5	Telegram	0	0	0	0

Figures in the parentheses indicate percentages

Table 4.4.4 reveals that:

a) Large majority of students of government colleges in Aizawl city which constitutes 93.33 per cent perceived that whatsapp messenger is the most popular online tools used by the teachers for communicating with them. The percentage of students who perceive the teachers as using electronic mail (e-mail) for that purpose is only 6.67. There is not a single student who perceive that teachers use online tools i.e. facebook, instagram and telegram for communicating with the students.

b) The percentage of students who perceive whatsapp messenger as the most popular online tool used by their teachers for communicating with them is highest (100%) among commerce students, second highest among arts students (95%) and third highest (85%) among science students.

4.5.0 The Problems Faced by Teachers of Government colleges in Aizawl City in the Use of ICT in Teaching - Learning process

Table 4.5.1

Problems Faced by Government College Teachers with Regard to Availability of Computer and Related Resources for Teaching - Learning in Colleges

Sl. No	Problems	Total N=176		Arts teachers N=135		Science teachers N=26		Commerce teachers N=15	
		Severe	Mild	Severe	Mild	Severe	Mild	Severe	Mild
1	Insufficient number of Computers	49 (27.84)	127 (72.16)	32 (23.71)	103 (76.29)	5 (19.23)	21 (80.77)	12 (80)	3 (20)
2	Insufficient number of Laptops	41 (23.29)	135 (76.71)	23 (17.04)	112 (82.96)	10 (38.46)	16 (61.54)	8 (53.33)	7 (46.67)
3	Insufficient number of LCD Projector	14 (7.95)	162 (92.05)	7 (5.19)	128 (94.81)	4 (15.38)	22 (84.62)	3 (20)	12 (80)
4	Insufficient number of Printers and Scanners	46 (26.14)	130 (73.86)	36 (26.67)	99 (73.33)	7 (26.92)	19 (73.08)	3 (20)	12 (80)
Total %		21.31	78.69	18.15	81.85	25	75	43.33	56.67

Figures in parentheses indicate percentages

According to Table 4.5.1,

a) All the government college teachers in Aizawl city have the problems of insufficient number of computer and related resources in colleges. However, these problems are not severe for most of them. Insufficient number of computers is considered as severe problem by 27.84 per cent, insufficient number of printers and scanners by 26.14 per cent, insufficient number of laptops by 23.29 per cent and insufficient number of LCD projector by 7.95 per cent of the college teachers.

b) Among the various streams of study, commerce stream has the largest percentage of teachers who take insufficient number of computers and related resources in colleges as severe problem. Insufficient number of computers is a severe problem for majority of them i.e., 80 % and insufficient number of laptops for 53.33 per cent.

c) Among arts and science teachers, majority of them take insufficient number of computers and related resources as mild problems.

Table 4.5.2

The Problems Faced by College Teachers Relating to the Use of Powerpoint Presentation in Classrooms

Sl. No	Problems	Total N=176		Arts teachers N=135		Science teachers N=26		Commerce teachers N=15	
		Severe	Mild	Severe	Mild	Severe	Mild	Severe	Mild
1	Non availability of LCD projectors in the classrooms	13 (7.39)	163 (92.61)	8 (5.93)	127 (94.07)	2 (7.69)	24 (92.31)	3 (20)	12 (80)
2	Non availability of laptops for use in the classrooms	35 (19.89)	141 (80.11)	21 (15.56)	114 (84.44)	11 (42.31)	15 (57.69)	3 (20)	12 (80)
3	Lack of technical knowledge on the preparation of slides	22 (12.5)	154 (87.5)	17 (12.59)	118 (87.41)	4 (15.38)	22 (84.62)	1 (6.67)	14 (93.33)
4	Irregularity of power supply	24 (13.64)	152 (86.36)	16 (11.85)	119 (88.15)	6 (23.08)	20 (76.92)	2 (13.33)	13 (86.67)
5	Non-functional projectors	11 (6.25)	165 (93.75)	8 (5.92)	127 (94.08)	2 (7.69)	24 (92.31)	1 (6.67)	14 (93.33)

6	Non-functional electric wiring/sockets	8 (4.54)	168 (95.46)	7 (5.19)	128 (94.81)	0	26 (100)	1 (6.67)	14 (93.33)
Total %		10.70	89.30	9.51	90.49	16.03	83.97	12.22	87.78

Figures in the parentheses indicate percentages

Table 4.5.2 indicates that:

a) All the government college teachers in Aizawl city have the problems related to the use of powerpoint presentation in classrooms teaching-learning process while these problems are not severe for most of the teachers. Non availability of laptops for use in the classrooms is considered as severe problem by 19.89 per cent. Irregularity of power supply by 13.64 per cent, lack of technical knowledge on the preparation of slides by 12.5 per cent, non availability of LCD projectors in the classrooms by 7.39 per cent, non-functional projectors by 6.25 per cent and non-functional electric wiring/sockets by 4.54 per cent.

b) The percentage of teachers who consider the problems related to powerpoint presentation in classroom as mild is highest (90.49%) among arts teachers followed by commerce teachers (87.78%) and then by science teachers (83.97%).

Table 4.5.3

The Problems Faced by College Teachers

Relating to the Use of Softwares for Preparation of Lectures and Actual Teaching

Sl. No	Problems	Total N=176		Arts teachers N=135		Science teachers N=26		Commerce teachers N=15	
		Severe	Mild	Severe	Mild	Severe	Mild	Severe	Mild
1	Slow speed wifi in the campus	101 (57.39)	75 (42.61)	77 (57.04)	58 (42.96)	10 (38.46)	16 (61.54)	14 (93.33)	1 (6.67)
2	Lack of knowledge on how to browse internet	3 (1.71)	173 (98.29)	3 (2.22)	132 (97.78)	0	26 (100)	0	15 (100)
3	Inability to give enough time for internet	19 (10.79)	157 (89.21)	15 (11.11)	120 (88.89)	2 (7.69)	24 (92.31)	2 (13.33)	13 (86.67)
4	Not expert in computer typing	13 (7.38)	163 (92.62)	7 (5.19)	128 (94.81)	4 (15.38)	22 (84.62)	2 (13.33)	13 (86.67)
Total %		19.32	80.68	18.89	81.11	15.38	84.62	30	70

Figures in the parentheses indicate percentages

Table 4.5.3 implies the following**:**

a) All the government college teachers in Aizawl city face softwares and its related problems for preparation of lectures and actual teaching. Slow speed wifi in the campus is a severe problem for majority of teachers (57.39 per cent), inability to give enough time for internet by 10.79 per cent, not expert in computer typing for 7.38 per cent and   lack of knowledge on how to browse internet for 1.71 per cent.

b) The percentage of teachers who take the problems relating to use of softwares for preparation of lectures and actual teaching as mild problems is highest among science teachers (84.62%), second highest among arts teachers (81.11%) and lowest among commerce teachers (70%).

4.6.0   The Problems Faced by Students of Government Colleges in Aizawl City in the Use of ICT in Teaching - Learning Process

Table 4.6.1

The Problems Faced by College Students with regard to Availability of Computer and Related Resources for Teaching – Learning in Colleges

Sl. No	Problems	Total N=180		Arts students N=60		Science students N=60		Commerce students N=60	
		Severe	Mild	Severe	Mild	Severe	Mild	Severe	Mild
1	Insufficient number of Computers	65 (36.11)	115 (63.89)	22 (36.67)	38 (63.33)	24 (40)	36 (60)	19 (31.67)	41 (68.33)
2	Insufficient number of Laptops	62 (34.44)	118 (65.56)	15 (25)	45 (75)	9 (15)	51 (85)	38 (63.33)	22 (36.67)
3	Insufficient number of LCD Projector	29 (16.11)	151 (83.89)	7 (11.67)	53 (88.33)	3 (5)	57 (95)	19 (31.67)	41 (68.33)
4	Insufficient number of Printers and Scanners	57 (31.67)	123 (68.33)	15 (25)	45 (75)	16 (26.67)	44 (73.33)	26 (43.33)	34 (56.67)
Total %		29.58	70.42	24.58	75.42	21.67	78.33	42.50	57.50

Figures in the parentheses indicate percentages

From the given Table 4.6.1:

a) All the government college students in Aizawl city have problems of insufficient number of computers, problems of computer and related resources in colleges for teaching-learning. However, these problems are not severe for most of them. Insufficient number of computers is considered as severe problem by 36.11 per cent, insufficient number of laptops by 34.44 per cent, insufficient number of printers and scanners by 31.67 and insufficient number of LCD projector by 16.11 per cent.

b) Among the different streams of study, commerce stream has the highest percentage of student (42.50%) who take insufficient number of computer and related ICT facilities as severe problem.

Table 4.6.2

The Problems Faced by College Students Relating to the Use of Powerpoint

Presentation in Classrooms by the Teachers

Sl. No	Problems	Total N=180		Arts students N=60		Science students N=60		Commerce students N=60	
		Severe	Mild	Severe	Mild	Severe	Mild	Severe	Mild
1	Non availability of LCD projectors in the classrooms	35 (19.44)	145 (80.56)	11 (18.33)	49 (81.67)	8 (13.33)	52 (86.67)	16 (26.67)	44 (73.33)
2	Non availability of laptops for use in the classrooms	58 (32.22)	122 (67.78)	17 (28.33)	43 (71.67)	15 (25)	45 (75)	26 (43.33)	34 (56.67)
3	Lack of technical knowledge on the preparation of slides	27 (15)	153 (85)	6 (10)	54 (90)	9 (15)	51 (85)	12 (20)	48 (80)
4	Irregularity of power supply	37 (20.56)	143 (79.44)	10 (16.67)	50 (83.33)	9 (15)	51 (85)	18 (30)	42 (70)
5	Non-functional projectors	31 (17.22)	149 (82.78)	9 (15)	51 (85)	2 (3.33)	58 (96.67)	20 (33.33)	40 (66.67)

6	Non-functional electric wiring/ sockets	15 (8.33)	165 (91.67)	4 (6.67)	56 (93.33)	3 (5)	57 (95)	8 (13.33)	52 (86.67)
Total %		18.79	81.21	15.83	84.17	12.78	87.22	27.78	72.22

Figures in the parentheses indicate percentages

According to Table 4.6.2,

a) All the government college students in Aizawl city face the problems related to the use of powerpoint presentation in classrooms by the teachers while these problems are not severe for most of them. Non availability of laptops for use in the classrooms is considered as severe problem by 32.22 per cent, irregularity of power supply by 20.56 per cent, non availability of LCD projectors in the classrooms by 19.44 per cent, non-functional projectors by 17.22 per cent, lack of technical knowledge on the preparation of slides by 15 per cent and non-functional electric wiring/sockets by 8.33 per cent.

b) Students who consider the problems related to the use of powerpoint presentation in classrooms by the teachers as mild were more in science students than arts and commerce streams. They constitute 87.22 per cent of science, 84.17 per cent of arts and 72.22 per cent of commerce students.

Table 4.6.3

The Problems Faced by College Students

Relating to the Use of Softwares for Learning

Sl. No	Problems	Total N=180		Arts students N=60		Science students N=60		Commerce students N=60	
		Severe	Mild	Severe	Mild	Severe	Mild	Severe	Mild
1	Slow speed wifi in the campus	125 (69.44)	55 (30.56)	42 (70)	18 (30)	36 (60)	24 (40)	47 (78.33)	13 (21.67)
2	Lack of knowledge on how to browse internet	18 (10)	162 (90)	8 (13.33)	52 (86.67)	4 (6.67)	56 (93.33)	6 (10)	54 (90)
3	Inability to give enough time for internet	46 (25.56)	134 (74.44)	15 (25)	45 (75)	11 (18.33)	49 (81.67)	20 (33.33)	40 (66.67)
4	Not expert in computer typing	50 (27.78)	130 (72.22)	8 (13.33)	52 (86.67)	15 (25)	45 (75)	27 (45)	33 (55)
Total %		33.19	66.81	30.42	69.58	27.50	72.50	41.67	58.33

Figures in the parentheses indicate percentages

Table 4.6.3 shows that :

a) All the government college students in Aizawl city face problems relating to the use of softwares for Learning. Slow speed wifi in the campus is a severe problem for majority of students i.e. 69.44 per cent. Not expert in computer typing for 27.78 per cent and lack of knowledge on how to browse internet for 10 per cent.

b) Majority of government college students in Aizawl city consider the problems relating to the use of softwares for learning as mild problems.

c) Again, science stream has the largest percentage of students (72.50%) who took the problems of softwares for learning as mild problems. It is followed by arts stream which has 69.58 per cent of students who consider the problems as not severe but mild.

CHAPTER – V

MAJOR FINDINGS AND CONCLUSIONS, RECOMMENDATIONS AND

SUGGESTIONS

CHAPTER V

MAJOR FINDINGS AND CONCLUSIONS,

RECOMMENDATIONS AND SUGGESTIONS

5.1.0 Major Findings and Conclusions

In this chapter, major findings and conclusions of the study, recommendations for improvement of ICT in teaching-learning process of government colleges in aizawl city and suggestions for further research are discussed and presented.

Major findings and conclusion of the study are arranged based on the objectives of the study under the following order:

5.1.1 Major Findings and Conclusions on the ICT Resources Available in Government Colleges in Aizawl City

5.1.2 Major Findings and Conclusions on the Extent to which ICT Resources are Used in Teaching - Learning Process of Government Colleges in Aizawl City

5.1.3 Major Findings and Conclusions on the Perception of Teachers about the Use of ICT in Teaching - Learning Process of Government Colleges in Aizawl City

5.1.4 Major Findings and Conclusions on the Perception of Students about the Use of ICT in Teaching - Learning Process of Government Colleges in Aizawl City

5.1.5 Major Findings and Conclusions on the Problems Faced by Teachers of Government Colleges in Aizawl City in the Use of ICT in Teaching - Learning Process

5.1.6 Major Findings and Conclusions on the Problems Faced by Students of Government Colleges in Aizawl City in the Use of ICT in Teaching - Learning process

5.1.7 Suggestions for Further Research

5.1.1 Major Findings and Conclusions on the ICT Resources Available in Government Colleges in Aizawl City

1. Background Information of Government Colleges in Aizawl City in Terms of Email and Website Provision

   All the government colleges in Aizawl city had email addresses and websites. The websites were monitored by IT Cell of the colleges and IQAC of the colleges in 2 colleges respectively; ICT cell, ICT committee and website committee of the colleges, and ICT department, Government of Mizoram in the case of one college respectively.

2. Computers and Laptops Available and the Purpose of Their Use in Government Colleges in Aizawl City

a) All the government colleges in Aizawl city had their own computers and laptops. Computers and laptops were used mainly for office work, teaching-

learning, library, language lab, NIELIT centre, IGNOU centre, geography lab, psychology lab, and SU office, science lab and BCA programme.

b) In terms of the number of computers owned by them, Govt. Hrangbana College stood first with 108 computers seconded by Govt. Aizawl West College with 70 computers followed by Govt. Aizawl College with 66 computers. The number of computers available in most of the colleges ranged from 46 to 108.

c) All the government colleges in Aizawl city used laptops for the purpose of lecture presentation/ power-point presentation. Apart from this, Govt. Zirtiri Residential Science College used laptops for Web-browsing collecting study materials. The number of laptops available in most of the colleges ranged from 4 to 28.

3. ICT/Computer Centres in Government Colleges in Aizawl City

   a) No college in Aizawl city had separate building for ICT/computer centre.

   b) All the government colleges in Aizawl city received fund from UGC, RUSA and NEDP for computer centres. The largest amount Rs.15 lakhs was received by Govt. Hrangbana College, the lowest amount Rs.8 lakhs by Govt. Aizawl North College and Rs.10 lakhs by rest of the colleges.

   c) Only two colleges i.e., Govt. Johnson College and Govt. Zirtiri Residential Science College did not provide room for NIELIT to run computer centre and the rest government colleges in Aizawl city provided rooms for NIELIT to run computer centres in collaboration with the

colleges. NIELIT offered CCC+ certificate course for students in the rest government colleges in Aizawl city.

d) Sizes of the rooms provided for computer centre ranged from 15 X 20 ft. provided by Govt. Aizawl North College, Govt. T. Romana College and Govt. Zirtiri Residential Science College to 24 X 28 ft provided by Govt. Aizawl West College.

e) Seating capacity and number of computers in the centres as reported by the colleges was 30 each in Govt. Aizawl College, Govt. Hrangbana College and Govt. J. Thankima College, 25 in Govt. T. Romana College and 20 in Govt. Aizawl West College and Govt. Aizawl North College. Govt. Zirtiri Residential Science College had 18 seating capacity but 20 computers.

4. ICT Facilities in the Classrooms of Government Colleges in Aizawl City

a) The number of ceiling mount LCD projector available in government colleges in Aizawl city ranged from 7-18. Govt. Hrangbana College had the largest number i.e. 18 followed by Govt. Aizawl West College and Govt. Aizawl College which had 17 and 16 projectors respectively. Govt. Aizawl North College had the least i.e., 7 followed by Govt. J. Thankima College which had 10 ceiling mount LCD projectors.

b) Govt. J. Thankima College had the largest number of portable LCD projector i.e., 6 whereas Govt. Aizawl College and Govt. Zirtiri Residential Science College had the least number i.e., 1.

c) Govt. Hrangbana College had the largest number of laptop for use in the classroom i.e., 28 followed by Govt. Johnson College which had 27 laptop. A college which had the least number of laptop for use in the classroom (i.e. 4) was Govt. Aizawl North College.

5. Wifi and E-Resources Available in Government Colleges in Aizawl City

   a) All the government colleges in Aizawl city were provided campus with free wifi.

   b) The UGC N-List was subscribed by Govt. Hrangbana College, Govt. J. Thankima College and Govt. T. Romana College to access e-journals. Govt. Hrangbana College had 75 titles of e-books and 55+ journals. The number of e-books and e-journals available in Govt. Zirtiri Residential Science College was 5000 and 700 respectively. Rest of the colleges did not have any e- resources, e-books and e-journals.

   c) SOUL 2.0 software was available in all the government colleges in Aizawl city and OPAC system was also used by all.

6. Internet Facilities Provided to Government Colleges in Aizawl City

   Govt. Aizawl College, Govt. Aizawl West College, Govt. Hrangbana College, Govt. T. Romana College and Govt. Zirtiri Residential Science College subscribed BSNL Broadband and JIO server for internet. Govt. Aizawl North College was the only college which subscribed ZIPRO. National Infomatics Centre, Aizawl provided internet facilities to Govt.

Johnson College. Since the campus cannot be reached by BSNL Broadband, Govt. J. Thankima College subscribes JIO server and NETSURF.

7. ICT Instructor and Training on ICT in Government Colleges in Aizawl City

Only Govt. Aizawl College and Govt. J. Thankima College engaged computer instructors/technicians from their own resources. NIELIT provided ICT instructors to 4 government colleges namely, Govt. Aizawl West College, Govt. Aizawl North College, Govt. Hrangbana College, and Govt. T. Romana College. All the government colleges in Aizawl city had conducted training on ICT in collaboration with NIELIT.

5.1.2 Major Findings and Conclusions on the Extent to which ICT Resources are Used in Teaching - Learning Process of Government Colleges in Aizawl City

1. ICT Resources of Colleges Used by College Teachers for Preparation of Lectures

a) Majority of teachers of government colleges in Aizawl city (65.50%) rarely or never used ICT resources such as desktop computers, e-resources (e-books, e-journals etc), wifi in the campus, photocopier, laptop computer, printer/scanner and pendrive of the college. Among the ICT resources of the colleges, printer/scanner and pendrive had equal percentages of highest frequent users (i.e., 46.02% of teachers).

b) Among teachers of different streams of study, science teachers were best users of ICT resources of colleges for preparation of lectures followed by commerce teachers and then by arts teachers as the percentages of frequent users are 52.75, 35.24 and 29.63 for science, commerce and arts teachers respectively.

c) The percentages of arts teachers who frequently use ICT resources of colleges were quite low that they ranged from 16.29 to 38.52 per cent. Thus, majority of them rarely or never used the resources.

2. Personal ICT Resources Used by College Teachers for Preparation of Lectures

a) Majority (59.98%) of teachers of government colleges in Aizawl city rarely or never used their personal ICT resources namely tablet, desktop computer, cellphone, pendrive, scanner, printer and laptop computer for preparation of lectures. Laptop computer has the highest percentage of frequent users (58.52%) followed by printer having 52.27 per cent and scanner 50.56 per cent frequent users. The percentages of teachers who frequently used tablet, desktop computer, cellphone, pendrive, printer, scanner and laptop computer ranged from 10.23 to 58.52 per cent.

b) Again, science teachers are the best users of personal ICT resources for preparation of lectures among teachers of different streams. The percentages of frequent users were 50.55 per cent of science teachers, 48.57 per cent of commerce teachers and 37.04 per cent of arts teachers.

3. Softwares Used by College Teachers for Preparation of Teaching Materials

   a) Majority (66.67%) of teachers of government colleges in Aizawl city rarely or never used softwares namely, CDs/DVDs, graphic charts, spreadsheets (excel etc), presentation software (powerpoint etc.), websites , search engines (google, yahoo etc), internet and word processors (word etc) for preparation of teaching materials. Word processors (word etc.) had the highest frequent users (68.18%). The percentages of teachers who frequently used CDs/DVDs, graphic charts, videos, spreadsheets (excel etc.), presentation software (powerpoint etc.), websites, search engines (google, yahoo etc) and internet ranged from 1.14 per cent to 63.07 per cent.

   b) Commerce teachers are the best frequent users of softwares for preparation of teaching materials followed by science teachers and then again by arts teachers the percentages of which are 49.63, 44.87 and 29.30 respectively.

4. ICT resources Used by College Teachers for Classroom Teaching-Learning Process

   a) Majority (77.50%) of teachers of government colleges in Aizawl city rarely or never used ICT resources in classroom teaching-learning process. Among the resources, laptop computer had highest percentage (44.32%) of frequent users followed by LCD projector for powerpoint presentation.

b) Among the teachers of different streams, commerce teachers were best followed by science teachers as the percentages of frequent users of ICT resources are 42.67 and 33.85 per cent respectively whereas it is 18.07 percent only in the case of arts teachers.

c) Whereas 80 per cent and 65.38 per cent of commerce and science teachers respectively frequently used laptop, 63.71 per cent of arts teachers rarely or never used it.

d) While 66.67 percent of commerce teachers and 50 per cent of science teachers were frequent users of LCD projector for powerpoint presentation, only 22.22 per cent of arts teachers frequently used the projector.

5. ICT Resources Used by College Teachers for Teaching-Learning Process Outside the Classrooms

a) Large majority (97.16%) of teachers of government colleges in Aizawl city rarely or never used language laboratory for outside classroom teaching-learning process. The only small percentage of teachers who used the laboratory were formed by arts teachers.

b) There were 26.92 per cent of science teachers who rarely or never used science laboratory.

6. ICT Resources (online tools/instant messengers) Used by College Teachers for Maintaining Informal Teaching, Tutorial and Communication with Students

    a) Majority (83.66%) of teachers of government colleges in Aizawl city rarely or never used online tools/instant messengers such as e-mail, facebook, instagram and telegram for maintaining informal teaching, tutorial and communication with students.

    b) Whatsapp messenger was the only online tools which majority (62.5%) of teachers frequently used for such purpose.

    c) The percentage of teachers who rarely or never used online tools for maintaining informal teaching, tutorial and communication with students was highest in science stream followed by arts and commerce stream.

5.1.3 Major Findings and Conclusions on the Perception of Teachers about the Use of ICT in Teaching - Learning Process of Government Colleges in Aizawl City

1. Perception of College Teachers about the Utilization of ICT Resources of Colleges by the Teachers in Teaching - Learning Process

    a) Majority of teachers of government colleges in Aizawl city which constituted 51.14 per cent perceived that some teachers utilized ICT resources of the college. The perception that most teachers utilize ICT resources of the college was held by only 34.09 per cent whereas only

8.52 per cent and 6.25 per cent found all teachers and few teachers respectively as utilizing the resources. There was not a single teacher who perceived that none of the teachers utilize ICT resources of the colleges.

b) Among arts teachers, the percentage of them who perceived that some teachers utilized ICT resources of the college was highest i.e. 52.59 per cent.

c) While 42.31 per cent of science teachers perceived that most teachers utilized ICT resources of the colleges, another 42.31 per cent found only some teachers as utilizing the resources in teaching – learning process.

d) Majority of commerce teachers i.e. 53.33 per cent found some teachers as utilizing ICT resources of the colleges. Another 46.67 per cent also perceived most teachers as utilizing ICT resources of the colleges in teaching – learning process.

2. Perception of College Teachers about the Utilization of Personal ICT Resources by the Teachers in Teaching - Learning process

a) Equal percentages of teachers of government colleges in Aizawl city i.e. 40.34 each perceived that most and some teachers utilized personal ICT resources in teaching-learning process. Again, equal percentages of teachers i.e. 9.66 found all and few teachers utilized personal ICT resources. There was no teacher who perceived that none of the teachers utilized personal ICT resources.

b) The largest number of arts teachers which constituted 43.71 per cent perceived that some teachers utilized personal ICT resources.

c) Majority of science teachers i.e. 65.38 per cent perceived that most teachers utilized personal ICT resources.

d) Majority of commerce teachers i.e. 60 per cent perceived that some teachers utilized personal ICT resources.

3. Perception of College Teachers about the Use of Powerpoint Presentation by the Teachers for Classroom Teaching

a) Majority of teachers of government colleges in Aizawl city which constituted 53.98 per cent perceived that some teachers used powerpoint presentation for classroom teaching. The perception that all teachers used powerpoint presentation for classroom teaching was held only by 1.70 per cent whereas 32.39 and 11.93 per cent found most and few teachers as using powerpoint presentation for classroom. There was not a single teacher who perceived that none of the teachers used powerpoint presentation for classroom teaching.

b) Among arts teachers, those who perceived that some teachers used powerpoint presentation for classroom teaching was largest in number which constituted 61.48 per cent.

c) Majority of science teachers which constituted 69.23 per cent perceived that most teachers used powerpoint presentation for classroom teaching.

d) The perception that most teachers used powerpoint presentation for classroom teaching was held by majority of commerce teachers i.e. 53.33 per cent.

4. Perception of College Teachers about the Benefits of Powerpoint Presentation for Classroom Teaching

a) Large majority of teachers of government colleges in Aizawl city which constituted 89.21 per cent perceived that powerpoint presentation helps a lot for classroom teaching. The perception that powerpoint presentation was of little help in the teaching-learning process was found by only 10.79 per cent. There was no single teacher who perceived that powerpoint presentation does not help in the teaching-learning process.

b) Large majority of arts teachers i.e. 89.63 per cent, science teachers i.e. 88.46 per cent, commerce teachers i.e. 86.67 per cent perceived that powerpoint presentation in the classroom helps a lot in the teaching-learning process. Thus, majority of teachers of government colleges in Aizawl city found powerpoint presentation as helping a lot in the teaching-learning process.

5. Perception of College Teachers about Online Tools Most Popularly Used by College Teachers for Communicating with the Students for Educational Purpose

a) As many as 96.02 per cent of teachers of government colleges in Aizawl city perceived that whatsapp messenger was the most popularly used tool for communicating with the students for educational purpose.

b) Only 3.98 per cent of the teachers perceived e-mail as popularly used by the teachers for the said purpose.

c) There was no teacher who perceived facebook, instagram and telegram as popularly used by the teachers themselves for educational purpose.

d) The percentages of arts, science and commerce teachers who perceived whatsapp messenger as the most popularly used online tool for communicating with the students for educational purpose were very high that the range was from 92.31 to 97.04 per cent.

5.1.4 Major Findings and Conclusions on the Perception of Students about the Use of ICT in Teaching - Learning Process of Government Colleges in Aizawl City

1. Perception of College Students about the Utilization of ICT Resources of Colleges by the Teachers in Teaching - Learning Process

a) The perception that some teachers utilize ICT resources of the college was held by the highest percentage of students (i.e. 43.33%). The second highest percentage of (i.e. 36.11%) students perceived most teachers as utilizing ICT resources of the college in teaching-learning process.

b) The highest percentage of arts and commerce students (46.67% and 45% respectively) had the perception that some teachers utilized ICT resources of the college in teaching-learning process. While this was so, the highest percentage (45%) of science students perceived most teachers as utilizing ICT resources of the college in teaching-learning process.

c) There was no student who held the perception that none of the teachers utilized ICT resources of the college in teaching-learning process.

2. Perception of College Students about the Use of Powerpoint Presentation Done by the Teachers for Classroom Teaching

a) The perception that most teachers used powerpoint presentation for classroom teaching was held by the highest percentage of students (46.11%).

b) While 41.67 per cent of arts students held the perception that most teachers used powerpoint presentation in classroom teaching; another 41.67 per cent of them perceived some teachers as using powerpoint presentation in classroom teaching.

c) There was not a single student who perceived that few or none of the teachers used powerpoint presentation.

d) Among science students, the percentage of them who perceived that all teachers used powerpoint presentation in classroom teaching was highest which constituted 48.33 per cent.

e) Majority of commerce students i.e. 71.67 per cent found that most teachers used powerpoint presentation for classroom teaching.

3. Perception of College Students about the Benefits of Powerpoint Presentation by the Teachers for Classroom Teaching

   a) Majority of students of government colleges in Aizawl city which constituted 79.44 per cent perceived that powerpoint presentation helped a lot in the teaching-learning process.

   b) There was not a single student who perceived that powerpoint presentation did not help in the teaching-learning process.

   c) The percentages of arts, science and commerce students who perceived powerpoint presentation as helping a lot in the teaching-learning process are as high as 71.67, 83.33 and 83.33 respectively.

4. Perception of College Students about Online Tools Most Popularly Used by College Teachers for Communicating with the Students for Educational Purpose

   a) Large majority of students of government colleges in Aizawl city which constituted 93.33 per cent perceived that whatsapp messenger was the most popular online tools used by the teachers for communicating with them. The percentage of students who perceived the teachers as using electronic mail (e-mail) for that purpose was only 6.67. There was not a

single student who perceived that teachers use online tools i.e. facebook, instagram and telegram for communicating with the students.

b) The percentage of students who perceived whatsapp messenger as the most popular online tool used by their teachers for communicating with them was highest (100%) among commerce students, second highest (95%) among arts students and third highest (85%) among science students.

5.1.5 Major Findings and Conclusions on the Problems Faced by Teachers of Government Colleges in Aizawl City in the Use of ICT in Teaching - Learning Process

1. The Problems Faced by Government College Teachers with Regard to Availability of Computer and Related Resources in Colleges

a) All the government college teachers in Aizawl city had the problems of insufficient number of computer and related resources in colleges. However, these problems were not severe for most of them.

b) Among the various streams of study, commerce stream had the largest percentage of teachers who took insufficient number of computers and related resources in colleges as severe problem. Insufficient number of computers was a severe problem for majority of them i.e., 80 % and insufficient number of laptops for 53.33 per cent.

c) Among arts and science teachers, majority of them took insufficient number of computers and related resources as mild problems.

2. The Problems Faced by College Teachers Relating to the Use of Powerpoint Presentation in Classrooms

   a) All the government college teachers in Aizawl city had the problems related to the use of powerpoint presentation in classrooms teaching-learning process while these problems were not severe for most of the teachers. Non availability of laptops for use in the classrooms was considered as severe problem by 19.89 per cent, irregularity of power supply by 13.64 per cent, lack of technical knowledge on the preparation of slides by 12.5 per cent, non availability of LCD projectors in the classrooms by 7.39 per cent, non-functional projectors by 6.25 per cent and non-functional electric wiring/sockets by 4.54 per cent.

   b) The percentage of teachers who considered the problems related to powerpoint presentation in classroom as mild was highest (90.49%) among arts teachers followed by commerce teachers (87.78%) and then by science teachers (83.97%).

3. The Problems Faced by College Teachers Relating to the Use of Softwares for Preparation of Lectures and Actual Teaching

   a) All the government college teachers in Aizawl city faced software and its related problems for preparation of lectures and actual teaching. Slow speed wifi in the campus was a severe problem for majority of teachers (57.39%), inability to give enough time for internet for 10.79 per cent, not

expert in computer typing for 7.38 per cent and lack of knowledge on how to browse internet for 1.71 per cent.

b) The percentage of teachers who took the problems relating to use of softwares for preparation of lectures and actual teaching as mild problems was highest among science teachers (84.62%), second highest among arts teachers (81.11%) and lowest among commerce teachers (70%).

5.1.6 Major Findings and Conclusions on the Problems Faced by Students of Government Colleges in Aizawl City in the Use of ICT in Teaching - Learning Process

1. The Problems Faced by College Students with regard to Availability of Computer and Related Resources for Teaching – Learning in Colleges

a) All the government college students in Aizawl city had problems of insufficient number of computers and related resources for teaching-learning in colleges. However, these problems were not severe for most of them. Insufficient number of computers was considered as severe problem by 36.11 per cent, insufficient number of laptops by 34.44 per cent, insufficient number of printers and scanners by 31.67 and insufficient number of LCD projector by 16.11 per cent.

b) Among the different streams of study, commerce stream had the highest percentage of student (42.50%) who took insufficient number of computer and related ICT facilities as severe problem.

c) Insufficient number of laptops was considered as a severe problem by majority (63.33%) of commerce students.

d) The percentages of students who took insufficient number of computer and related facilities as mild problems was highest among science students (78.33%), second highest among arts students (75.42%) and lowest among commerce students (57.70%).

2. The Problems Faced by College Students Relating to the use of Powerpoint Presentation in Classrooms by the teachers

a) All the government college students in Aizawl city faced the problems related to the use of powerpoint presentation in classrooms by the teachers while these problems were not severe for most of them. Non availability of laptops for use in the classrooms was considered as severe problem by 32.22 per cent, irregularity of power supply by 20.56 per cent, non availability of LCD projectors in the classrooms by 19.44 per cent, non-functional projectors by 17.22 per cent, lack of technical knowledge on the preparation of slides by 15 per cent and non-functional electric wiring/sockets by 8.33 per cent.

b) Students who considered the problems related to the use of powerpoint presentation in classrooms by the teachers as mild were more among science students than arts and commerce streams. They constituted 87.22 per cent of science, 84.17 per cent of arts and 72.22 per cent of commerce students.

3. The Problems Faced by College Students Relating to the Use of Softwares for Learning

   a) All the government college students in Aizawl city faced problems relating to the use of softwares for learning. Slow speed wifi in the campus was a severe problem for majority of students i.e. 69.44 per cent, not expert in computer typing for 27.78 per cent and lack of knowledge on how to browse internet for 10 per cent.

   b) Majority of government college students in Aizawl city considered the problems relating to the use of softwares for learning as mild problems.

   c) Again, science stream had the largest percentage of students (72.50%) who took the problems of softwares for learning as mild problems. It was followed by arts stream which has 69.58 per cent of students who considered the problems as not severe but mild.

5.2.0 Recommendations for Improvement of ICT in Teaching- Learning Process of Government Colleges in Aizawl City

The following suggestions are given for improvement of the status of ICT in teaching-learning process of government colleges in Aizawl city in particular and in Mizoram in general:

1. Websites of the colleges should be carefully and regularly monitored so that up-to-date information about the colleges can be accessed by the public.

2. All the classrooms should be equipped with ceiling mount LCD projectors and laptops and all the teachers of the colleges should be efficient in using these facilities for teaching. Lectures should be accompanied and/or supported by power-point presentation to make teaching more interesting and effective.

3. All the colleges should educate their students on how to utilize free wifi provided in the campus for educational purposes.

4. Colleges should make efforts to subscribe good numbers of e-books and e-journals and should make them accessible to their students.

5. Government of Mizoram, Department of Higher and Technical Education should provide government colleges with all the required ICT infrastructures and facilities for effective use of ICT in teaching learning process. The colleges also should try their best to utilize the facilities in the best possible manner.

6. Colleges should ensure that their teachers are educated in the use of ICT for classroom teaching learning process. They may hire or engage ICT experts to give proper training on the effective use of ICT for teaching-learning process to both the teachers and students.

7. Colleges may start maintenance of ICT register of their own for recording the utilization of ICT resources of the colleges by the teachers.

8. Colleges should make efforts to provide adequate number of laptops and projectors for use in the classrooms.

9. Portable voice amplifiers may be made available to college teachers for use in classrooms where and when needed.

10. All the colleges should try to solve the problems faced by them in a systematic way.

5.3.0   Discussion of Findings and Their Implications

The present study found that all the government colleges in Aizawl city had email addresses and websites monitored by their respective IT or ICT cell or Committee which implies that the basic requirement for communicating with the students and public at large through ICT has been met in the colleges.

There was one college which had only 4 laptops and another two colleges having only 8 and 9 laptops. In view of the number of classes running simultaneously in the colleges, it may not be possible for these colleges to make laptops accessible to the teachers for every class. The number of laptops for use in the classrooms available in colleges ranged from 4 to 28. While that was so, non-availability of laptops for use in the classrooms was reported as severe problem by 19.89 per cent of the teachers and insufficient number of laptops by 34.44 per cent of the students. These findings confirm the inaccessibility of the available laptops in the colleges for classroom use by the teachers. This is in agreement with the finding of Gulbahar and Guven (2008) who studied ICT usage of social studies teachers in Turkey, according to which although teachers wanted to use ICT resources, they were faced with problems in relation to accessibility to ICT resources.

All the government colleges in Aizawl city reported that they used laptops for the purpose of lecture presentation/ power-point presentation. The intensity of their utilization however, does not appear to be high as the highest percentage of the teachers (51.14 %) and students (43.33%) perceived that some teachers utilized ICT resources of the college in teaching-learning process. This may indicate that there are a number of teachers who do not utilize them for teaching. This has the support of Makura (2014) in whose study in South African university, students reported that most lecturers did not use ICT for teaching.

It is good to find that all the campuses of government colleges in Aizawl city have been provided with free wifi. However, findings on how this provision has been utilized for teaching and learning are not welcoming since large majority of both arts and commerce teachers rarely or never utilized the wifi provided in the college campuses for preparation of lectures. Findings on problems of the teachers and students reveal that both the teachers and students considered slow speed wifi in the campus as severe problem while rest of the problems were taken as mild problems only. This indicates that free wifi provided in the college campuses in Aizawl city are quite slow that they could not be utilized for serious and important tasks.

The position of government colleges in Aizawl city with regard to e-resources is not satisfactory as all of them except Government Hrangbana College are without the facility of e-books and e-journals. However, it is delightful to find that SOUL 2.0 software and OPAC system were made available in libraries of the colleges. Again it is good to find that training on ICT has been conducted by all the colleges in collaboration with NIELIT.

The present study found that ICT resources of the colleges were not properly utilized by the teachers in teaching-learning process. There were some teachers who utilized their personal ICT resources for preparation of lectures; however, the proportion of teachers frequently utilizing them was lower than those who rarely or never utilized them. Among the resources, laptop is the one most frequently utilized by the teachers for this purpose. The percentage of frequent utilizers was highest amongst science teachers, second highest among commerce teachers followed by arts teachers.

The findings that college teachers considered insufficient number of computers, laptops, LCD projector, printer and scanner as mild problems only may imply that most colleges had sufficient number of ICT resources or facilities or their expectations on the availability of ICT resources were very low due to unawareness of their importance in modern teaching-learning process. This is in contrast with the finding of Qablan, Abuloum and Jamal (2009) who, in a study in Jordanian school, found most in-service teachers, students, principals and computer lab supervisors expressing frustration at the lack of ICT tools.

All the government college teachers in Aizawl city had the problem of insufficient number of computer and related resources in colleges although the problem was not considered as severe by them. Shortage of resources was reported as one of the barriers to technology implementation by Gebremedhin and Fenta (2015) also.

While majority of arts and science teachers took insufficient number of computers and related resources as mild problems, commerce teachers considered

this as severe problem. This may imply that commerce teachers are the ones who have the highest expectations from colleges with regard to ICT resources.

5.4.0   Suggestions for Further Research

The present study reveals ICT resources available in government colleges in Aizawl city, the extent to which ICT resources are used by the teachers in teaching – learning process, teachers' and students' perception about the use of ICT in teaching - learning and the problems faced by them. The following are suggested for further study:

1. A comprehensive study on ICT in teaching- learning process of colleges in Mizoram.

2. A study on teachers and students attitude towards the use of ICT in teaching-learning process of Mizoram.

3. A comparative study on the usages of ICTs by science teacher, commerce teachers and humanities teachers in teaching-learning process.

4. A study of availability of ICT facilities for integrating technology in the teaching learning process at different levels of education in Mizoram.

5. An evaluative study of the effectiveness of ICT in teaching –learning process of colleges in Mizoram.

6. A study on implementation of ICT programmes in secondary schools in Mizoram.//

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TITLE OF DISSERTATION   :   ICT in Teaching-
Learning Process of
Government Colleges in
Aizawl City: Status and
Problems.

DATE OF ADMISSION   :   27th July 2018

COMMENCEMENT OF DISSERTATION   :   February 2019

APPROVAL OF RESEARCH PROPOSAL

     1. BOS   :   26th April 2019

     2. SCHOOL BOARD   :   8th May 2019

     3. REGISTRATION NO. & DATE   :   MZU/M.Phil/507 of
08.05.2019

     4. DUE DATE OF SUBMISSION   :   31st January, 2020

     5. EXTENSION (If any)   :   NA

(Prof. B.B. MISHRA)

Head

Department of Education

APPENDICES

Observation cum Interview Schedule

(for Principals for studying ICT Resources Available in Government Colleges in

Aizawl City)

1. Name of the College :

    Email Address   :

    Website   :   Monitored by :

    Courses offered   :

2. Number of computers and laptops available and purposes of their use

    a)   No. of computers that the college has :

    b)   For what purposes are the computers used?

    c)   No. of laptops that the college has :

    d)   For what purposes are the laptops used?

3. Does the college have separate building for ICT Centre: Yes / No

    If Yes,

    a) Amount of fund received   :

    b) Source of fund   :

    c) Size of the building   :

    d) Nature of the building   : Concrete/ Semi-concrete/Assam type

    e) Maintenance of the building : Good/ Average / Poor

    f) No. of computers   :

    g) Sitting capacity   :

    h) Working hours   :

    i) Any other   :

4. Classrooms equipped with ICT facilities : Yes / No

    If yes, facilities available:

    a) Ceiling Mount LCD Projector.   No.

    b) Portable LCD Projector   No.

    c) Laptop ready for use in the classroom.   No.

    d)   Any others:

5. Is campus of the college provided with free Wi-Fi?   Yes / No

    Any comment:

6. Are E-Resources provided by INFLIBNET or any others made available to the

college?

                                                                Yes / No

    If yes, what type?

    a) e-books with no. of the books :

    b) e-journals with no. of the journals :

7. Any ICT training or other professional development related to ICT provided by

    the college for the teachers:

8. Details about internet connection provided to the college:

9. Who provides ICT support at your institution?

10. What kind of ICT resources are provided by your college for teaching – learning

    process?

11. What is the present status of availability of ICT resources?

12. Does the institution have a Computer/ICT instructor?   Yes / No

    If yes, give details:

Questionnaire for Teachers

_____

INSTRUCTION:

The purpose of this Questionnaire is to study:

1. To what extent ICT resources are used by the teachers in teaching - learning process

2. The teachers' perception about the use of ICT in teaching - learning process.

3. The problems faced by teachers in the use of ICT in teaching-learning process.

Please read and answer each question carefully and ask for help if you do not understand or not sure of how to respond. Answering this questionnaire may require 5-10 minutes. The secrecy of all responses shall be maintained in strict confidentiality. All the items are grouped under Part-I, II and III and numbered accordingly. Your input is very important for this study to bring out a desirable outcome. Please put tick marks (√) in the relevant brackets provided against items appearing under each question. Your honest response is of immense importance for this study.

_____

PERSONAL INFORMATION:

Age: 25-34 ☐   35-44 ☐   45-54 ☐   55-64 ☐

Gender: M ☐   F ☐

Subject(s) taught: _____

Teaching experience in years: 1-9 (   )   10-19 (   )   20-29 (   )   30 and

above (   )

PART: I

The Extent to which ICT Resources are Used in Teaching - Learning Process

1. What ICT resources of your college do you use for preparation of your lectures?

	Frequently	Rarely/ Never
a) Desktop Computer	( )	( )
b) Laptop Computer	( )	( )
c) Printer/Scanner	( )	( )
d) Photocopier	( )	( )
e) Wifi in the campus	( )	( )
f) Pendrive	( )	( )
g) e-resources (e-books,e-journals etc) of the College Library	( )	( )
h) Any others: _____		

2. What personal ICT resources do you use for preparation of your lectures?

	Frequently	Rarely/ Never
a) Desktop Computer	( )	( )
b) Laptop Computer	( )	( )
c) Printer	( )	( )
d) Tablet	( )	( )
e) Cellphone	( )	( )

f) Pendrive ( ) ( )

g) Any others: _____

3. What type of softwares do you use for preparing teaching materials?

	Frequently	Rarely/ Never
a) Word Processors (Word etc.)	( )	( )
b) Spreadsheets (Excel etc.)	( )	( )
c) Presentation Software (PowerPoint etc.)	( )	( )
d) Search Engines (google, yahoo etc)	( )	( )
e) CDs/DVDs	( )	( )
f) Videos	( )	( )
g) Graphic charts	( )	( )
h) Websites	( )	( )
i) Internet	( )	( )

j) Any others: _____

4. What ICT resources do you use for classroom teaching-learning process ?

	Frequently	Rarely/ Never
a) Desktop Computer	( )	( )
b) Laptop Computer	( )	( )
c) LCD projector for powerpoint presentation	( )	( )
d) Ceiling Mount LCD projector for powerpoint presentation	( )	( )
e) Instructional Films (video,CD,VCD etc.)	( )	( )

f) Any others: _____

5. What ICT resources do you use for teaching-learning outside the classrooms?

	Frequently	Rarely/ Never
a) Language Laboratory	( )	( )
b) Science Laboratory	( )	( )
c) Any others: _____		

6. What ICT resources (online tools/instant messengers) do you use and maintain for informal teaching, tutorial and communication with your students?

	Frequently	Rarely/ Never
a) Electronic Mail (E-Mail)	( )	( )
b) Facebook	( )	( )
c) Whatsapp Messenger	( )	( )
d) Instagram	( )	( )
e) Telegram	( )	( )
f) Any others: _____		

PART : II

Teachers' Perception about the Use of ICT Resources in Teaching - Learning Process by the Teachers

1. What is your perception about utilization of ICT resources of your college by the teachers in teaching-learning process?

a) All teachers utilize ICT resources of the college ( )

b) Most teachers utilize ICT resources of the college ( )

c) Some teachers utilize ICT resources of the college ( )

d) Few teachers utilize ICT resources of the college ( )

e) None of the teachers utilize ICT resources of the college ( )

2. What is your perception about the utilization of personal ICT resources by the teachers in teaching-learning process?

a) All teachers utilize personal ICT resources ( )

b) Most teachers utilize personal ICT resources ( )

c) Some teachers utilize personal ICT resources ( )

d) Few teachers utilize personal ICT resources ( )

e) None of the teachers utilize personal ICT resources ( )

3. What is your perception about the use of powerpoint presentation for classroom teaching among the teachers of your college?

a) All teachers use powerpoint presentation for classroom teaching ( )

b) Most teachers use powerpoint presentation for classroom teaching ( )

c) Some teachers use powerpoint presentation for classroom teaching ( )

d) Few teachers use powerpoint presentation for classroom teaching ( )

e) None of the teachers use powerpoint presentation for classroom teaching ( )

4. What is your perception about the benefits of powerpoint presentation by the teachers of your college for classroom teaching?

a) Powerpoint presentation helps a lot in the teaching learning process ( )

b) Powerpoint presentation is of little help in the teaching learning process ( )

c) Powerpoint presentation does not help in the teaching learning process ( )

6. According to your perception, which of the following online tools are most popularly used by teachers of your college for communicating with the students for

educational purpose: Assign no.1 to the most popularly used, No.2 to the second most popularly used and so on:

a) Electronic Mail (E-Mail)   (   )

b) Facebook   (   )

c) Whatsapp Messenger   (   )

d) Instagram   (   )

e) Telegram   (   )

f) Any others:_____

PART: III

The Problems Faced by Teachers in the Use of ICT in Teaching-Learning Process.

1. What problems do you have with regard to availability of computer and related resources in your college? Specify whether they are severe or mild.

	Severe	Mild
a) Insufficient number of Computers	( )	( )
b) Insufficient number of Laptops	( )	( )
c) Insufficient number of LCD Projector	( )	( )
d) Insufficient number of Printers and Scanners	( )	( )

2. What are your problems relating to the use of powerpoint presentation in classrooms? Specify whether they are severe or mild.

	Severe	Mild
a) Non availability of LCD projectors in the classrooms	( )	( )
b) Non availability of laptops for use in the classrooms	( )	( )
c) Lack of technical knowledge on the preparation of slides	( )	( )
d) Irregularity of power supply	( )	( )
e) Non-functional projectors	( )	( )
f) Non-functional electric wiring/sockets	( )	( )

g) Any others: _____

3. What are your problems relating to the use of softwares for preparation of lectures and actual teaching? Specify whether they are severe or mild.

	Severe	Mild
a) Slow speed wifi in the campus	( )	( )
b) Lack of knowledge on how to browse internet	( )	( )
c) Inability to give enough time for internet	( )	( )
d) Not expert in computer typing	( )	( )

e) Any others:_____

Thank you for your kind cooperation

Questionnaire for Students

_____

INSTRUCTION:

The purpose of this Questionnaire is to study:

1. The students' perception about the teachers' use of ICT in teaching - learning

2. The problems faced by the students in the use of ICT in teaching-learning process.

Please read and answer each question carefully and ask for help if you do not understand or not sure of how to respond. Answering this questionnaire may require 5-10 minutes. The secrecy of all responses shall be maintained in strict confidentiality. All the items are grouped under Part - A and B and numbered accordingly. Your input is very important for this study to bring out a desirable outcome. Please put tick mark (√) in the relevant brackets provided against items appearing under each question. Your honest response is of immense importance for this study.

_____

PERSONAL INFORMATION:

Age:　　　　☐

Gender:　M　☐　　　F　☐

Streams:　Arts (　) Science (　) Commerce (　)

PART : A

Students' Perception about the Use of ICT Resources in Teaching - Learning Process by the Teachers

1. What is your perception about utilization of ICT resources of your college by the teachers in teaching-learning process?

    a)   All teachers utilize ICT resources of the college   ( )

    b) Most teachers utilize ICT resources of the college   ( )

    c) Some teachers utilize ICT resources of the college   ( )

    d) Few teachers utilize ICT resources of the college   ( )

    e) None of the teachers utilize ICT resources of the college   ( )

2. What is your perception about the use of powerpoint presentation done by the teachers of your college for classroom teaching?

    a) Most teachers use powerpoint presentation for classroom teaching   ( )

    b) Some teachers use powerpoint presentation for classroom teaching   ( )

    c) Few teachers use powerpoint presentation for classroom teaching   ( )

    d) None of the teachers use powerpoint presentation for classroom teaching ( )

3. What is your perception about the benefits of powerpoint presentation by the teachers of your college for classroom teaching?

    a) Powerpoint presentation helps a lot in the teaching learning process   ( )

    b) Powerpoint presentation is of little help in the teaching learning process ( )

    c) Powerpoint presentation does not help in the teaching learning process   ( )

4. According to your perception, which of the following online tools are most popularly used by teachers of your college for communicating with the students for educational purpose: Assign no.1 to the most popularly used, No.2 to the second most popularly used and so on:

a) Electronic Mail (E-Mail)   ( )

b) Facebook   ( )

c) Whatsapp Messenger   ( )

d) Instagram   ( )

e) Telegram   ( )

f) Any others:_____

PART: B

The Problems Faced by Students in the Use of ICT in Learning

1. What problems do you have with regard to availability of computer and related resources in your college? Specify whether they are severe or mild.

	Severe	Mild
a) Insufficient number of Computers	( )	( )
b) Insufficient number of Laptops	( )	( )
c) Insufficient number of LCD Projector	( )	( )
d) Insufficient number of Printers and Scanners	( )	( )

2. What are your problems relating to the use of powerpoint presentation in classrooms by the teachers of your college? Specify whether they are severe or mild.

		Severe	Mild
a)	Non availability of LCD projectors in the classrooms	( )	( )
b)	Non availability of laptops for use in the classrooms	( )	( )
c)	Lack of technical knowledge on the preparation of slides	( )	( )
d)	Irregularity of power supply	( )	( )
e)	Non-functional projectors	( )	( )
f)	Non-functional electric wiring/sockets	( )	( )
g)	Any others: _____		

3. What are your problems relating to the use of softwares for learning? Specify whether they are severe or mild.

		Severe	Mild
a)	Slow speed wifi in the campus	( )	( )
b)	Lack of knowledge on how to browse internet	( )	( )
c)	Inability to give enough time for internet	( )	( )
d)	Not expert in computer typing	( )	( )
e)	Any others:_____		

Thank you for your kind cooperation

MIZORAM UNIVERSITY (A Central University)

M.Phil Dissertation Certificate of Plagiarism Check

Name of the Research Scholar/Student	VANLALRUATI	
M.Phil. Registration Number	MZU/M.Phil/507 of 08.05.2019	
M.Phil dissertation	ICT in Teaching Learning Process of Government Colleges in Aizawl City : Status and Problems	
Name & Institutional Address of the Supervisor/Joint Supervisor	MIZORAM UNIVERSITY	
Name of the Department and School	DEPARTMENT OF EDUCATION AND SCHOOL OF EDUCATION AND HUMANITIES	
Date of Submission	31.01.2020	
Date of plagiarism check	27.01.2020	
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APPENDIX-E

Plagiarism Verification Certificate

(This certificate should be submitted to the Examination Department at the time of submission of the Thesis/Dissertation)

This is to certify that the plagiarism check has been performed for M.Phil. Dissertation **ICT in Teaching-Learning Process of Government Colleges in Aizawl City : Status and Problems** submitted by Mr./Ms. **VANLALRUATI,** under the Supervision of **Prof. Lalhmasai Chuaungo** Department of Education, School of Education and Humanities, Mizoram University. The check performed by the Scholar/Student is found correct/adheres to MZU regulations and authentic software **Urkund** has been used for the similarity check

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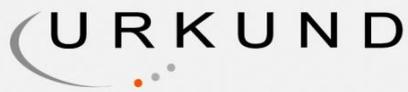
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Urkund Analysis Result

Analysed Document:	Vanlalruati - CORE for URKUND.docx (D63027713)
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Submitted By:	ctluanga@yahoo.co.in
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URKUND

Urkund Analysis Result

Analysed Document:	Vanlalruati - NONCORE for URKUND.docx (D63027714)
Submitted:	1/27/2020 7:01:00 AM
Submitted By:	ctluanga@yahoo.co.in
Significance:	7 %

ICT IN TEACHING- LEARNING PROCESS OF GOVERNMENT COLLEGES IN AIZAWL CITY: STATUS AND PROBLEMS

ABSTRACT

VANLALRUATI

DEPARTMENT OF EDUCATION

MIZORAM UNIVERSITY

ICT IN TEACHING- LEARNING PROCESS OF GOVERNMENT

COLLEGES IN AIZAWL CITY: STATUS AND PROBLEMS

ABSTRACT

BY

VANLALRUATI

DEPARTMENT OF EDUCATION

MIZORAM UNIVERSITY

Submitted

In partial fulfillment of the requirement of the Degree of Master of Philosophy

in Education of Mizoram University, Aizawl.

Introduction

With the advancement in information and communication technology, the world today has become a world of digital communication. Everybody, young or old, educated or uneducated, is affected positively or negatively by digital communication technology. ICT is a boon or a bane depending upon the way it is used. There are many instances when children, youths, adults, students and teachers misuse ICT or do not use it as it should be. It is, thus, necessary to make everybody aware of the negative effects of the misuse of ICT as well as the positive effects of proper use of it. Both teachers and students need to be made aware of various information technologies and their uses in the field of education. In this regard, teachers' responsibility is higher than that of the students. It is the teachers' responsibility to update their knowledge and skills in using ICT to make the fullest utilization of recent technological advancements and resources available. With changing teaching methods in curriculum transactions, teachers need to leave their apprehensions behind technology-mediated instruction and need to employ new technologies. Policy makers and educational administrators are responsible to redesign and reconstruct their views and ideas upon the educational systems, based on the new educational paradigms in this digital age. Most countries around the world are focusing on approaches to integrate ICT in teaching-learning to improve the quality of education by emphasizing competencies such as critical thinking, decision-making, and handling of dynamic situations, working as a member of a team and communicating effectively (Anderson & Weert, 2002). (Padmavathi, 2013).

Rationale of the Study

The UGC in its 532nd meeting held on 24.5.2018 approved the objectives set for improving the quality in higher education institutions (HEIs) through its Notices-166 on '*Quality Mandate for improving quality in higher education*' which was published in the UGC website on 4.6.2018. All HEIs shall strive to achieve the objectives by 2022 in which initiatives shall be undertaken to pursuit the use of ICT-based learning tools for an effective teaching-learning process (Ramganesh, 2011).

The traditional approaches and methods of teaching-learning have witnessed a reformative transformation and its place is occupied by ICT tools such as online smart-boards, projectors, laptops, android systems, PCs, online lectures, tablets, cellular phones, e-readers, web resources and, other software and hardware devices. Education satellites have made its stake in the process of teaching-learning and evaluation. The use of ICT tools and resources is highly increased in recent years (Sawant, 2015).

As the world is progressing fastly in the integration of ICT in education, what is the position of Mizoram is a question that comes to the mind of the present investigator. Some more issues that need to be addressed are:

1. ICT resources and facilities that are made available in government colleges in Aizawl city, the capital of Mizoram state.

2. The extent to which ICT resources available in government colleges in Aizawl city are utilized for teaching-learning purpose.

3. Teachers' and students' perceptions about the use of ICT in teaching-learning process of government colleges in Aizawl city.

4. Problems faced by teachers and students of government colleges in Aizawl city in the use of ICT in teaching-learning process.

To address the issues raised above, undertaking a research is felt necessary. Thus, an attempt has been made to conduct a study in the area of ICT in education at higher education level.

Statement of the Problem

The present study focuses on the ICT resources available in government colleges in Aizawl city, the capital of Mizoram and the utilization of those resources by teachers in imparting education. To validate the study, perceptions of the teachers and students of the colleges about the use of those resources in education are also covered. The study also explores the problems encountered by the teachers and students in this regard. The problem of the present study is thus stated as "ICT in Teaching-Learning Process of Government Colleges in Aizawl City: Status and Problems".

Operational Definitions of Key Terms Used

The key terms used in the title of the present study are operationally defined as follow:

ICT: In the present study, ICT stands for Information and Communication Technology and refers to technological tools and resources used to create, store, manage, disseminate and communicate information to the learners and that are used in teaching-learning process.

Teaching-Learning Process: The term 'Teaching - Learning Process' in the present study implies a process of delivery and dissemination of information to the learners in an educational setting to bring about desired changes in the students.

Government Colleges in Aizawl City: The term 'Government Colleges in Aizawl City' refers to colleges run and managed by the Government of Mizoram located in Aizawl city, the capital of Mizoram and offering general undergraduate courses of studies such as arts, science and commerce.

Objectives of the Study

Objectives of the present study are as under:

1) To find out the ICT resources available in government colleges in Aizawl city.

2) To study the extent to which ICT resources are used in teaching-learning process of government colleges in Aizawl city.

3) To study the perception of teachers about the use of ICT in teaching-learning process of government colleges in Aizawl city.

4) To study the perception of students about the use of ICT in teaching-learning process of government colleges in Aizawl city.

5) To study the problems faced by teachers of government colleges in Aizawl city in the use of ICT in teaching-learning process.

6) To study the problems faced by students of government colleges in Aizawl city in the use of ICT in teaching-learning process.

7) To suggest some measures for improvement in the use of ICT in teaching - learning process of government colleges in Aizawl city.

Research Approach

The present study adopted a descriptive research as it had to describe the status and problems related to ICT in teaching-learning process of government colleges in Aizawl city. For analysis of data collected for the present study, both qualitative and quantitative approaches were followed.

Population and Sample

Three types of population and sample were involved for the present study. These are:

i) *Population and Sample of Government Colleges in Aizawl City*: All the government colleges in Aizawl city offering arts, science and commerce streams of studies formed population of the present study. The number of such colleges as in March, 2019 was 8 (eight). Sample selection was not done as the number of the colleges was small. Thus, all the 8 government colleges offering arts, science and commerce located in Aizawl city were covered in the study.

ii) *Population and Sample of Teachers*: All the arts, science and commerce teachers of government colleges in Aizawl city constituted the second group of population for the present study. There were 350 teachers (as per college office records as on 27th March.2019) which formed the population. A sample of 176 teachers comprising 50.29 per cent of the teachers in each college representing arts, science and commerce streams were selected by following random sampling method.

iii) *Population and Sample of Students*:   Population of students for the present study comprised of all the students of government colleges in Aizawl city. There were 8523 students (enrolled as on 5th September. 2019) in government colleges in Aizawl city. In the first stage, purposive sampling technique was followed and that selection of sample students was restricted to 5th Semester as students at this stage were experienced enough to give proper judgement on whether their teachers properly use ICT in teaching-learning process or not. Thus, out of 2188 students of 5th Semester, a sample of 180 students comprising of 60 each from arts, science and commerce streams was selected by following random sampling method.

Population and sample distribution are presented in the following tables:

Table 3.1.0

Population of Government Colleges in Aizawl City Offering General Courses, Teachers and Students Therein

Sl. No	Name of Colleges	No. of Teachers (including part time and contract teachers)	Students enrolment	5th semester students
1	Govt. Aizawl College	55	1236	343
2	Govt. Aizawl West College	37	804	220
3	Govt. Aizawl North College	34	1227	334
4	Govt. Hrangbana College	65	1810	493
5	Govt. Johnson College	27	990	184
6	Govt. J. Thankima College	32	590	153
7	Govt. T. Romana College	36	1226	292
8	Govt. Zirtiri Residential Science College	64	640	169
	Total	350	8523	2188 (Arts: 1909 Science: 169 Commerce: 110)

Sample Distribution for the Study

Stream of Studies	Sample Teachers	Sample Students
Arts	135	60
Science	26	60
Commerce	15	60
TOTAL	176	180

Tools Used

The following tools constructed by the investigator were used for the present study:

1. Observation cum Interview Schedule for Principals for studying ICT resources available in government colleges in Aizawl city.

2. Questionnaire for Teachers for studying:

    a) The extent to which ICT resources are used in teaching - learning process

    b) Their perception about the use of ICT in teaching - learning process.

    c) The problems faced by them in the use of ICT in teaching-learning process.

3. Questionnaire for Students for studying:

    a) Students perception about the use of ICT in teaching - learning process.

    b) The problems faced by them in the use of ICT in teaching-learning process.

Collection of Data

Data were collected from 8 Principals, 176 teachers and 180 students of 8 government colleges in Aizawl city offering general courses of studies by administering the questionnaires meant from them.

Statistical Treatment of Data

The data obtained were tabulated in terms of frequencies and percentages. Then, the results obtained were analysed both quantitatively and qualitatively. For quantitative analysis, simple statistical techniques such as frequencies and percentages were applied.

Major Findings and Conclusions

Major findings and conclusion of the study are arranged based on the objectives of the study under the following heads:

Major Findings and Conclusions on the ICT Resources Available in Government Colleges in Aizawl City

1. Background Information of Government Colleges in Aizawl City in Terms of Email and Website Provision

   All the government colleges in Aizawl city had email addresses and websites. The websites were monitored by IT Cell of the colleges and IQAC of the colleges in 2 colleges respectively; ICT cell, ICT Committee and Website Committee of the colleges, and ICT department, Government of Mizoram in the case of one college respectively.

2. Computers and Laptops Available and the Purpose of Their Use in Government Colleges in Aizawl City

   a) All the government colleges in Aizawl city had their own computers and laptops. Computers and laptops were used mainly for Office Work, Teaching – Learning, Library, Language Lab, NIELIT Centre, IGNOU Centre, Geography lab, Psychology Lab, and SU office, science lab and BCA programme.

   b) In terms of the number of computers owned by them, Govt. Hrangbana College stood first with 108 computers seconded by Govt. Aizawl West College with 70 computers followed by Govt. Aizawl College with 66 computers. The number of computers available in most of the colleges ranged from 46 to 108.

   c) All the government colleges in Aizawl city used laptops for the purpose of Lecture presentation/ power-point presentation. Apart from this, Govt. Zirtiri Residential Science College used laptops for Web-browsing collecting study materials. The number of laptops available in most of the colleges ranged from 4 to 28.

3. ICT/Computer Centres in Government Colleges in Aizawl City

   a) No college in Aizawl city had separate building for ICT/computer centre.

   b) All the government colleges in Aizawl city received fund from UGC, RUSA and NEDP for computer centres. The largest amount Rs.15 lakhs was received by Govt. Hrangbana College, the lowest amount Rs.8 lakhs by Govt. Aizawl North College and Rs.10 lakhs by rest of the colleges.

c) Only two colleges i.e., Govt. Johnson College and Govt. Zirtiri Residential Science College did not provide room for NIELIT to run computer centre and the rest government colleges in Aizawl city provided rooms for NIELIT to run computer centres in collaboration with the colleges. NIELIT offered CCC+ Certificate Course for Students in the rest government colleges in Aizawl city.

d) Sizes of the rooms provided for computer centre ranged from 15 X 20 ft. provided by Govt. Aizawl North College, Govt.T.Romana College and Govt. Zirtiri Residential Science College to 24 X 28 ft provided by Govt. Aizawl West College.

e) Seating capacity and number of computers in the centres as reported by the colleges was 30 each in Govt. Aizawl College, Govt. Hrangbana College and Govt. J. Thankima College, 25 in Govt. T. Romana College and 20 in Govt. Aizawl West College and Govt. Aizawl North College. Govt. Zirtiri Residential Science College had 18 seating capacity but 20 computers.

4. ICT Facilities in the Classrooms of Government Colleges in Aizawl City

a) The number of Ceiling Mount LCD Projector available in government colleges in Aizawl city ranged from 7-18. Govt. Hrangbana College had the largest number i.e. 18 followed by Govt. Aizawl West College and Govt. Aizawl College which had 17 and 16 projectors respectively. Govt. Aizawl North College had the least i.e., 7 followed by Govt. J. Thankima College which had 10 Ceiling Mount LCD projectors.

b) Govt. J. Thankima College had the largest number of portable LCD Projector i.e., 6 whereas Govt. Aizawl College and Govt. Zirtiri Residential Science College had the least number i.e., 1.

c) Govt. Hrangbana College had the largest number of Laptop for use in the classroom i.e., 28 followed by Govt. Johnson College which had 27 Laptop. A college which had the least number of Laptop for use in the classroom (i.e. 4) was Govt. Aizawl North College.

5. Wifi and E-Resources Available in Government Colleges in Aizawl City

a) All the government colleges in Aizawl city were provided campus with free wifi.

b) The UGC N-List was subscribed by Govt. Hrangbana College, Govt. J. Thankima College and Govt. T. Romana College to access e-journals. Govt. Hrangbana College had 75 titles of e-books and 55+ journals. The number of e-books and e-journals available in Govt. Zirtiri Residential Science College was 5000 and 700 respectively. Rest of the colleges did not have any e- resources, e-books and e-journals.

c) SOUL 2.0 software was available in all the government colleges in Aizawl city and OPAC system was also used by all.

6. Internet Facilities Provided to Government Colleges in Aizawl City

Govt. Aizawl College, Govt. Aizawl West College, Govt. Hrangbana College, Govt. T. Romana College and Govt. Zirtiri Residential Science College subscribed BSNL Broadband and JIO Server for internet. Govt. Aizawl North College was the only college which subscribed ZIPRO. National Infomatics Centre, Aizawl provided internet facilities to Govt. Johnson College. Since the campus cannot be reached by BSNL Broadband, Govt. J. Thankima College subscribes JIO Server and NETSURF.

7. ICT Instructor and Training on ICT in Government Colleges in Aizawl City

Only Govt. Aizawl College and Govt. J. Thankima College engaged computer instructors/technicians from their own resources. NIELIT provided ICT instructors to 4 government colleges namely, Govt. Aizawl West College, Govt. Aizawl North College, Govt. Hrangbana College, and Govt. T. Romana College. All the government colleges in Aizawl city had conducted training on ICT in collaboration with NIELIT.

Major Findings and Conclusions on the Extent to which ICT Resources are Used in Teaching - Learning Process of Government Colleges in Aizawl City

1. ICT Resources of Colleges Used by College Teachers for Preparation of Lectures

   a) Majority of teachers of government colleges in Aizawl city (65.50%) rarely or never used ICT resources such as desktop computers, e-resources (e-books, e-journals etc), wifi in the campus, photocopier,

laptop Computer, printer/scanner and pendrive of the college. Among the ICT resources of the colleges, printer/scanner and pendrive had equal percentages of highest frequent users (i.e., 46.02% of teachers).

b) Among teachers of different streams of study, science teachers were best users of ICT resources of colleges for preparation of lectures followed by commerce teachers and then by arts teachers as the percentages of frequent users are 52.75, 35.24 and 29.63 for science, commerce and arts teachers respectively.

c) The percentages of arts teachers who frequently use ICT resources of colleges were quite low that they ranged from 16.29 to 38.52 per cent. Thus, majority of them rarely or never used the resources.

2. Personal ICT Resources Used by College Teachers for Preparation of Lectures

a) Majority (59.98%) of teachers of government colleges in Aizawl city rarely or never used their personal ICT resources namely tablet, desktop computer, cellphone, pendrive, scanner, printer and laptop computer. Laptop computer has the highest percentage of frequent users (58.52%) followed by printer having 52.27 per cent and scanner 50.56 per cent. The percentages of teachers who frequently use tablet, desktop computer, cellphone, pendrive, printer, scanner and laptop computer ranged from 10.23 to 58.52 per cent.

b) Again, science teachers are the best users of personal ICT resources for preparation of lectures among teachers of different streams. The

percentages of frequent users are 50.55 per cent of science teachers, 48.57 per cent of commerce teachers and 37.04 per cent of arts teachers.

3. Softwares Used by College Teachers for Preparation of Teaching Materials

   a) Majority (66.67%) of teachers of government colleges in Aizawl city rarely or never used softwares namely, CDs/DVDs, graphic charts, spreadsheets (excel etc), presentation software (powerpoint etc.), websites, search engines (google, yahoo etc), internet and word processors (word etc) for preparation of teaching materials. Word processors (word etc.) had the highest frequent users (68.18%). The percentages of teachers who frequently used CDs/DVDs, graphic charts, videos, spreadsheets (excel etc.), presentation software (powerpoint etc.), websites, search engines (google, yahoo etc) and internet ranged from 1.14 per cent to 63.07 per cent.

   b) Commerce teachers are the best frequent users of softwares for preparation of teaching materials followed by science teachers and then again by arts teachers the percentages of which are 49.63,44.87 and 29.30 respectively.

4. ICT resources Used by College Teachers for Classroom Teaching-Learning Process

   a) Majority (77.50%) of teachers of government colleges in Aizawl city rarely or never used ICT resources in classroom teaching-learning process. Among the resources, laptop computer had highest percentage

(44.32%) of frequent users followed by LCD projector for powerpoint presentation.

b) Among the teachers of different streams, commerce teachers were best followed by science teachers as the percentages of frequent users of ICT resources are 42.67 and 33.85 per cent respectively whereas it is 18.07 percent only in the case of arts teachers.

c) Whereas 80 per cent and 65.38 per cent of commerce and science teachers respectively frequently used laptop, 63.71 per cent of arts teachers rarely or never used it.

d) While 66.67 per cent of commerce teachers and 50 per cent of science teachers were frequent users of LCD projector for powerpoint presentation, only 22.22 per cent of arts teachers frequently used the projector.

5. ICT Resources Used by College Teachers for Teaching-Learning Process Outside the Classrooms

a) Large majority (97.16%) of teachers of government colleges in Aizawl city rarely or never used language laboratory for outside classroom teaching-learning process. The only small percentage of teachers who used the laboratory were formed by arts teachers.

b) There were 26.92 per cent of science teachers who rarely or never used science laboratory.

6. ICT Resources (online tools/instant messengers) Used by College Teachers for Maintaining Informal Teaching, Tutorial and Communication with Students

   a) Majority (83.66%) of teachers of government colleges in Aizawl city rarely or never used online tools/instant messengers such as e-mail, facebook, instagram and telegram for maintaining informal teaching, tutorial and communication with students.

   b) Whatsapp messenger was the only online tools which majority (62.5%) of teachers frequently used for such purpose.

   c) The percentage of teachers who rarely or never used online tools for maintaining informal teaching, tutorial and communication with students was highest in science stream followed by arts and commerce stream.

Major Findings and Conclusions on the Perception of Teachers about the Use of ICT in Teaching - Learning Process of Government Colleges in Aizawl City

1. Perception of College Teachers about the Utilization of ICT Resources of Colleges by the Teachers in Teaching - Learning Process

   a) Majority of teachers of government colleges in Aizawl city which constituted 51.14 per cent perceived that some teachers utilized ICT resources of the college. The perception that most teachers utilize ICT resources of the college was held by only 34.09 per cent whereas only 8.52 per cent and 6.25 per cent found all teachers and few teachers respectively as utilizing the resources. There was not a single teacher

who perceived that none of the teachers utilize ICT resources of the colleges.

b) Among arts teachers, the percentage of them who perceived that some teachers utilized ICT resources of the college was highest i.e. 52.59 per cent.

c) While 42.31 per cent of science teachers perceived that most teachers utilized ICT resources of the colleges, another 42.31 per cent found only some teachers as utilizing the resources in teaching – learning process.

d) Majority of commerce teachers i.e. 53.33 per cent found some teachers as utilizing ICT resources of the colleges. Another 46.67 per cent also perceived most teachers as utilizing ICT resources of the colleges in teaching – learning process.

2. Perception of College Teachers about the Utilization of Personal ICT Resources by the Teachers in Teaching - Learning process

a) Equal percentages of teachers of government colleges in Aizawl city i.e. 40.34 each perceived that most and some teachers utilized personal ICT resources in teaching-learning process. Again, equal percentages of teachers i.e. 9.66 found all and few teachers utilized personal ICT resources. There was no teacher who perceived that none of the teachers utilized personal ICT resources.

b) The largest number of arts teachers which constituted 43.71 per cent perceived that some teachers utilized personal ICT resources.

c) Majority of science teachers i.e. 65.38 per cent perceived that most teachers utilized personal ICT resources.

d) Majority of commerce teachers i.e. 60 per cent perceived that some teachers utilized personal ICT resources.

3. Perception of College Teachers about the Use of Powerpoint Presentation by the Teachers for Classroom Teaching

a) Majority of teachers of government colleges in Aizawl city which constituted 53.98 per cent perceived that some teachers used powerpoint presentation for classroom teaching. The perception that all teachers used powerpoint presentation for classroom teaching was held only by 1.70 per cent whereas 32.39 and 11.93 per cent found most and few teachers as using powerpoint presentation for classroom. There was not a single teacher who perceived that none of the teachers used powerpoint presentation for classroom teaching.

b) Among arts teachers, those who perceived that some teachers used powerpoint presentation for classroom teaching was largest in number which constituted 61.48 per cent.

c) Majority of science teachers which constituted 69.23 per cent perceived that most teachers used powerpoint presentation for classroom teaching.

d) The perception that most teachers used powerpoint presentation for classroom teaching was held by majority of commerce teachers i.e. 53.33 per cent.

4. Perception of College Teachers about the Benefits of Powerpoint Presentation for Classroom Teaching

a) Large majority of teachers of government colleges in Aizawl city which constituted 89.21 per cent perceived that powerpoint presentation helps a lot for classroom teaching. The perception that powerpoint presentation was of little help in the teaching-learning process was found by only 10.79 per cent. There was no single teacher who perceived that powerpoint presentation does not help in the teaching-learning process.

b) Large majority of arts teachers i.e. 89.63 per cent, science teachers i.e. 88.46 per cent, commerce teachers i.e. 86.67 per cent perceived that powerpoint presentation in the classroom helps a lot in the teaching-learning process. Thus, majority of teachers of government colleges in Aizawl city found powerpoint presentation as helping a lot in the teaching-learning process.

5. Perception of College Teachers about Online Tools Most Popularly Used by College Teachers for Communicating with the Students for Educational Purpose

a) As many as 96.02 per cent of teachers of government colleges in Aizawl city perceived that whatsapp messenger was the most popularly used tool for communicating with the students for educational purpose.

b) Only 3.98 per cent of the teachers perceived e-mail as popularly used by the teachers for the said purpose.

c) There was no teacher who perceived facebook, instagram and telegram as popularly used by the teachers themselves for educational purpose.

d) The percentages of arts, science and commerce teachers who perceived whatsapp messenger as the most popularly used online tool for communicating with the students for educational purpose were very high that the range was from 92.31 to 97.04 per cent.

Major Findings and Conclusions on the Perception of Students about the Use of ICT in Teaching - Learning Process of Government Colleges in Aizawl City

1. Perception of College Students about the Utilization of ICT Resources of Colleges by the Teachers in Teaching - Learning Process

   a) The perception that some teachers utilize ICT resources of the college was held by the highest percentage of students (i.e.43.33%). The second highest percentage of (i.e.36.11%) students perceived teachers as utilizing ICT resources of the college in teaching-learning process.

   b) The highest percentage of arts and commerce students (46.67% and 45% respectively) had the perception that some teachers utilized ICT resources of the college in teaching-learning process. While this was so, the highest percentage (45%) of science students perceived most teachers as utilizing ICT resources of the college in teaching-learning process.

   c) There was no student who held the perception that none of the teachers utilized ICT resources of the college in teaching-learning process.

2. Perception of College Students about the Use of Powerpoint Presentation Done by the Teachers for Classroom Teaching

   a) The perception that most teachers use powerpoint presentation for classroom teaching was held by the highest percentage of students (46.11%).

   b) While 41.67 per cent of arts students held the perception that most teachers used powerpoint presentation in classroom teaching; another 41.67 per cent of them perceived some teachers as using powerpoint presentation in classroom teaching.

   c) There was not a single student who perceived that few or none of the teachers used powerpoint presentation.

   d) Among science students, the percentage of them who perceived that all teachers used powerpoint presentation in classroom teaching was highest which constituted 48.33 per cent.

   e) Majority of commerce students i.e.71.67 per cent found that most teachers used powerpoint presentation for classroom teaching.

3. Perception of College Students about the Benefits of Powerpoint Presentation by the Teachers for Classroom Teaching

   a) Majority of students of government colleges in Aizawl city which constituted 79.44 per cent perceived that powerpoint presentation helped a lot in the teaching-learning process.

   b) There was not a single student who perceived that powerpoint presentation did not help in the teaching-learning process.

c) The percentages of arts, science and commerce students who perceived powerpoint presentation as helping a lot in the teaching-learning process are as high as 71.67, 83.33 and 83.33 respectively.

4. Perception of College Students about Online Tools Most Popularly Used by College Teachers for Communicating with the Students for Educational Purpose

   a) Large majority of students of government colleges in Aizawl city which constituted 93.33 per cent perceived that whatsapp messenger was the most popular online tools used by the teachers for communicating with them. The percentage of students who perceived the teachers as using electronic mail (e-mail) for that purpose was only 6.67. There was not a single student who perceived that teachers use online tools i.e. facebook, instagram and telegram for communicating with the students.

   b) The percentage of students who perceived whatsapp messenger as the most popular online tool used by their teachers for communicating with them was highest (100%) among commerce students, second highest (95%) among arts students and third highest (85%) among science students.

Major Findings and Conclusions on the Problems Faced by Teachers of Government Colleges in Aizawl City in the Use of ICT in Teaching - Learning Process

1. The Problems Faced by Government College Teachers with Regard to Availability of Computer and Related Resources in Colleges

   a) All the government college teachers in Aizawl city had the problems of insufficient number of computer and related resources in colleges. However, these problems were not severe for most of them.

   b) Among the various streams of study, commerce stream had the largest percentage of teachers who took insufficient number of computers and related resources in colleges as severe problem. Insufficient number of computers was a severe problem for majority of them i.e., 80 % and insufficient number of laptops for 53.33 per cent.

   c) Among arts and science teachers, majority of them took insufficient number of computers and related resources as mild problems.

2. The Problems Faced by College Teachers Relating to the Use of Powerpoint Presentation in Classrooms

   a) All the government college teachers in Aizawl city had the problems related to the use of powerpoint presentation in classrooms teaching-learning process while these problems were not severe for most of the teachers. Non availability of laptops for use in the classrooms was considered as severe problem by 19.89 per cent, irregularity of power supply by 13.64 per cent, lack of technical knowledge on the preparation

of slides by 12.5 per cent, non availability of LCD projectors in the classrooms by 7.39 per cent, non-functional projectors by 6.25 per cent and non-functional electric wiring/sockets by 4.54 per cent.

b) The percentage of teachers who considered the problems related to powerpoint presentation in classroom as mild was highest (90.49%) among arts teachers followed by commerce teachers (87.78%) and then by science teachers (83.97%).

3. The Problems Faced by College Teachers Relating to the Use of Softwares for Preparation of Lectures and Actual Teaching

a) All the government college teachers in Aizawl city faced software and its related problems for preparation of lectures and actual teaching. Slow speed wifi in the campus was a severe problem for majority of teachers (57.39%), inability to give enough time for internet for 10.79 per cent, not expert in computer typing for 7.38 per cent and lack of knowledge on how to browse internet for 1.71 per cent.

b) The percentage of teachers who took the problems relating to use of softwares for preparation of lectures and actual teaching as mild problems was highest among science teachers (84.62%), second highest among arts teachers (81.11%) and lowest among commerce teachers (70%).

Major Findings and Conclusions on the Problems Faced by Students of Government Colleges in Aizawl City in the Use of ICT in Teaching - Learning Process

1. The Problems Faced by College Students with regard to Availability of Computer and Related Resources for Teaching – Learning in Colleges

   a) All the government college students in Aizawl city had problems of insufficient number of computers and related resources for teaching-learning in colleges. However, these problems were not severe for most of them. Insufficient number of computers was considered as severe problem by 36.11 per cent, insufficient number of laptops by 34.44 per cent, insufficient number of printers and scanners by 31.67 and insufficient number of LCD projector by 16.11 per cent.

   b) Among the different streams of study, commerce stream had the highest percentage of student (42.50%) who took insufficient number of computer and related ICT facilities as severe problem.

   c) Insufficient number of laptops was considered as a severe problem by majority (63.33%) of commerce students.

   d) The percentages of students who took insufficient number of computer and related facilities as mild problems was highest among science students (78.33%), second highest among arts students (75.42%) and lowest among commerce students (57.70%).

2. The Problems Faced by College Students Relating to the use of Powerpoint Presentation in Classrooms by the teachers

   a) All the government college students in Aizawl city faced the problems related to the use of powerpoint presentation in classrooms by the teachers while these problems were not severe for most of them. Non availability of laptops for use in the classrooms was considered as severe problem by 32.22 per cent, irregularity of power supply by 20.56 per cent, non availability of LCD projectors in the classrooms by 19.44 per cent, non-functional projectors by 17.22 per cent, lack of technical knowledge on the preparation of slides by 15 per cent and non-functional electric wiring/sockets by 8.33 per cent.

   b) Students who considered the problems related to the use of powerpoint presentation in classrooms by the teachers as mild were more among science students than arts and commerce streams. They constituted 87.22 per cent of science, 84.17 per cent of arts and 72.22 per cent of commerce students.

3. The Problems Faced by College Students Relating to the Use of Softwares for Learning

   a) All the government college students in Aizawl city faced problems relating to the use of softwares for learning. Slow speed wifi in the campus was a severe problem for majority of students i.e. 69.44 per cent, not expert in computer typing for 27.78 per cent and lack of knowledge on how to browse internet for 10 per cent.

b) Majority of government college students in Aizawl city considered the problems relating to the use of softwares for learning as mild problems.

c) Again, science stream had the largest percentage of students (72.50%) who took the problems of softwares for learning as mild problems. It was followed by arts stream which has 69.58 per cent of students who considered the problems as not severe but mild.

Recommendations for Improvement of ICT in Teaching- Learning Process of Government Colleges in Aizawl City

The following suggestions are given for improvement of the status of ICT in teaching-learning process of government colleges in Aizawl city in particular and in Mizoram in general:

1. Websites of the colleges should be carefully and regularly monitored so that up-to-date information about the colleges can be accessed by the public.

2. All the classrooms should be equipped with ceiling mount LCD projectors and laptops and all the teachers of the colleges should be efficient in using these facilities for teaching. Lectures should be accompanied and/or supported by power-point presentation to make teaching more interesting and effective.

3. All the colleges should educate their students on how to utilize free wifi provided in the campus for educational purposes.

4. Colleges should make efforts to subscribe good numbers of e-books and e-journals and should make them accessible to their students.

5. Government of Mizoram, Department of Higher and Technical Education should provide government colleges with all the required ICT infrastructures and facilities for effective use of ICT in teaching learning process. The colleges also should try their best to utilize the facilities in the best possible manner.

6. Colleges should ensure that their teachers are educated in the use of ICT for classroom teaching learning process. They may hire or engage ICT experts to give proper training on the effective use of ICT for teaching-learning process to both the teachers and students.

7. Colleges may start maintenance of ICT register of their own for recording the utilization of ICT resources of the colleges by the teachers.

8. Colleges should make efforts to provide adequate number of laptops and projectors for use in the classrooms.

9. Portable voice amplifiers may be made available to college teachers for use in classrooms where and when needed.

10. All the colleges should try to solve the problems faced by them in a systematic way.

Discussion of Findings and Their Implications

The present study found that all the government colleges in Aizawl city had email addresses and websites monitored by their respective IT or ICT cell or Committee which implies that the basic requirement for communicating with the students and public at large through ICT has been met in the colleges.

There was one college which had only 4 laptops and another two colleges having only 8 and 9 laptops. In view of the number of classes running simultaneously in the colleges, it may not be possible for these colleges to make laptops accessible to the teachers for every class. The number of laptops for use in the classrooms available in colleges ranged from 4 to 28. While that was so, non-availability of laptops for use in the classrooms was reported as severe problem by 19.89 per cent of the teachers and insufficient number of laptops by 34.44 per cent of the students. These findings confirm the inaccessibility of the available laptops in the colleges for classroom use by the teachers. This is in agreement with the finding of Gulbahar and Guven (2008) who studied ICT usage of social studies teachers in Turkey, according to which although teachers wanted to use ICT resources, they were faced with problems in relation to accessibility to ICT resources.

All the government colleges in Aizawl city reported that they used laptops for the purpose of lecture presentation/ power-point presentation. The intensity of their utilization however, does not appear to be high as the highest percentage of the teachers (51.14 %) and students (43.33%) perceived that some teachers utilized ICT resources of the college in teaching-learning process. This may indicate that there are a number of teachers who do not utilize them for teaching. This has the support of Makura (2014) in whose study in South African university, students reported that most lecturers did not use ICT for teaching.

It is good to find that all the campuses of government colleges in Aizawl city have been provided with free wifi. However, findings on how this provision has been utilized for teaching and learning are not welcoming since large majority of both arts and commerce teachers rarely or never utilized the wifi provided in the college

campuses for preparation of lectures. Findings on problems of the teachers and students reveal that both the teachers and students considered slow speed wifi in the campus as severe problem while rest of the problems were taken as mild problems only. This indicates that free wifi provided in the college campuses in Aizawl city are quite slow that they could not be utilized for serious and important tasks.

The position of government colleges in Aizawl city with regard to e-resources is not satisfactory as all of them except Government Hrangbana College are without the facility of e-books and e-journals. However, it is delightful to find that SOUL 2.0 software and OPAC system were made available in libraries of the colleges. Again it is good to find that training on ICT has been conducted by all the colleges in collaboration with NIELIT.

The present study found that ICT resources of the colleges were not properly utilized by the teachers in teaching-learning process. There were some teachers who utilized their personal ICT resources for preparation of lectures; however, the proportion of teachers frequently utilizing them was lower than those who rarely or never utilized them. Among the resources, laptop is the one most frequently utilized by the teachers for this purpose. The percentage of frequent utilizers was highest amongst science teachers, second highest among commerce teachers followed by arts teachers.

The findings that college teachers considered insufficient number of computers, laptops, LCD projector, printer and scanner as mild problems only may imply that most colleges had sufficient number of ICT resources or facilities or their expectations on the availability of ICT resources were very low due to unawareness of their importance in modern teaching-learning process. This is in contrast with the

finding of Qablan, Abuloum and Jamal (2009) who, in a study in Jordanian school, found most in-service teachers, students, principals and computer lab supervisors expressing frustration at the lack of ICT tools.

All the government college teachers in Aizawl city had the problem of insufficient number of computer and related resources in colleges although the problem was not considered as severe by them. Shortage of resources was reported as one of the barriers to technology implementation by Gebremedhin and Fenta (2015) also.

While majority of arts and science teachers took insufficient number of computers and related resources as mild problems, commerce teachers considered this as severe problem. This may imply that commerce teachers are the ones who have the highest expectations from colleges with regard to ICT resources.

Suggestions for Further Research

The present study reveals ICT resources available in government colleges in Aizawl city, the extent to which ICT resources are used by the teachers in teaching – learning process, teachers' and students' perception about the use of ICT in teaching - learning and the problems faced by them. The following are suggested for further study:

1. A comprehensive study on ICT in teaching- learning process of colleges in Mizoram.

2. A study on teachers and students attitude towards the use of ICT in teaching- learning process of Mizoram.

3. A comparative study on the usages of ICTs by science teacher, commerce teachers and humanities teachers in teaching-learning process.

4. A study of availability of ICT facilities for integrating technology in the teaching learning process at different levels of education in Mizoram.

5. An evaluative study of the effectiveness of ICT in teaching –learning process of colleges in Mizoram.

6. A study on implementation of ICT programmes in secondary schools in Mizoram.//