ATTITUDE OF SECONDARY SCHOOL TEACHERS TOWARDS MOBILE LEARNING IN RELATION TO CERTAIN DEMOGRAPHIC VARIABLES

A DISSERTATION SUBMITTED ON PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF

MASTER OF PHILOSOPHY (M. PHIL.)

IN

EDUCATION

Submitted By

SILE HAIKAM

Roll. No. 02/2020

Under the supervision of

Dr. PRADIPTA KUMAR PATTNAIK

Associate Professor

Department of Teacher Education

Nagaland University

DEPARTMENT OF TEACHER EDUCATION

NAGALAND UNIVERSITY

KOHIMA CAMPUS, MERIEMA, NAGALAND- 797004

December, 2021

ACKNOWLEDGEMENT

I thank the Almighty for providing me the opportunity, strength, resources and helpful people in my life to aspire and complete this research work.

I express my profound gratitude to my supervisor Dr. Pradipta Kumar Pattnaik, Associate Professor, Department of Teacher Education, Nagaland University, Kohima campus, Meriema, for his constant guidance, encouragement, involvement and support. His utmost interest, initiation and guidance throughout every aspect of this study have made to visualize the success of this research work.

I am grateful to Dr. M. Rajendra Nath Babu, Dr. Neha Rawat, Asst. Prof., and Dr. Surendra Yadav, Asst. Prof., Nagaland University, for their valuable suggestions, support and encouragement that inspired me to work harder.

I am thankful to the teachers of different schools in Dimapur district for providing me all facilities needed for this research at the institution. I express my sincere thanks to the Principals, Head masters, Head Teachers and Teacher In charges as well for their encouragement in all aspect of my intellectual pursuit.

SILE HAIKAM

Roll.no. 02/2020

M. Phil Research Scholar

DECLARATION

I, SILE HAIKAM, Roll. No. 02/2020 M. Phil Research Scholar hereby declare that the dissertation entitled 'Attitude of Secondary school teachers towards mobile learning in relation to certain demographic variables' is a bonafide record of independent research work done by me under the supervision of Dr. Pradipta Kumar Pattnaik, Associate Professor, Department of Teacher Education and submitted to Nagaland University, Kohima Campus, Meriema for the award of Master of Philosophy (M. Phil.) in Education. I declare that no chapter in this manuscript has been lifted either in whole or in part and incorporated in this dissertation work for any earlier work done by me or by others.

SILE HAIKAM
Roll. No. 02/2020
M. Phil Research Scholar

NAGALAND UNIVERSITY

(A Central University Established by the Act of Parliament, 35/1989)

Department of Teacher Education

School of Humanities & Education

Kohima Campus, Meriema, Kohima- 797 004

PLAGIARISM CERTIFICATE

M. Phil. Dissertation Certificate on Plagiarism Check

TOPIC: Attitude of Secondary school teachers towards mobile learning in relation to certain demographic variables.

Name of the Research Scholar	**Sile Haikam**
Roll. No.	**02/2020**
Name of the Supervisor	**Dr. Pradipta Kumar Pattnaik**
Name of the Department	**Department of Teacher Education, NU**
Date of Submission	**25-11-2021**
Date of Plagiarism Check	**25-11-2021**
Percentage of similarity detected by the URKUND Software	**6%**

I hereby declare that the M. Phil. Dissertation submitted by me is complete in all respect, as per the guidelines of Nagaland University (NU) for the purpose. I also certify that the dissertation (soft copy) has been checked for plagiarism using **URKUND** similarity check software. It is also certified that the contents of the electronic version of the dissertation are the same hardcopy of dissertation. Copy of the report generated by **URKUND** software is also enclosed.

SILE HAIKAM
Roll. No. 02/2020
M. Phil. Research Scholar

Dr. Pradipta Kumar Pattnaik
(Supervisor)
Associate Professor
Department of Teacher Education
Nagaland University, Kohima Campus, Meriema

NAGALAND UNIVERSITY

(A Central University Established by the Act of Parliament, 35/1989)

Department of Teacher Education

School of Humanities & Education

Kohima Campus, Meriema, Kohima- 797 004

CERTIFICATE

This is to certify that SILE HAIKAM, Roll. No. 02/2020, M.Phil. Research Scholar of Teacher Education Department, Nagaland University, Kohima Campus Meriema, has worked under my supervision. Her study entitled "ATTITUDE OF SECONDARY SCHOOL TEACHERS TOWARDS MOBILE LEARNING IN RELATION TO CERTAIN DEMOGRAPHIC VARIABLES" is her genuine work. She has worked satisfactorily and the work embodied in this dissertation is her own. She has successfully completed her dissertation work within the stipulated time. The dissertation is fit for submission.

The dissertation is ready and fit for submission and may be placed before the examiners for consideration of award of Degree of Master of Philosophy (M. Phil.) in Education of this University**.**

Dr. Pradipta Kumar Pattnaik

(Supervisor)

Associate Professor

Department of Teacher Education

Nagaland University, Kohima Campus, Meriema

LIST OF TABLES

LIST OF GRAPHS

CONTENTS

CHAPTER-I: INTRODUCTION

CHAPTER-II: REVIEW OF RELATED LITERATURE

2.1 Introduction

2.2 Purpose of review of literature

2.3 Need of review of literature

2.4 International studies

2.5 National studies

2.6 Conclusion and overview of forthcoming chapter

CHAPTER-III: METHODOLOGY

3.1 Introduction

3.2 Method of study

3.2.1 Descriptive survey method

3.2.2 Steps in descriptive research

3.2.3 Characteristics of descriptive research

3.3 Population and sample of the study

3.4. Description of the tool

3.4.1 First draft of the scale

3.4.2 Second draft of the scale

3.5 Scoring system

3.6 Item analysis

3.7 Final draft

3.8 Serial number wise distribution of items

3.9 Standardization of the scale

3.9.1 Reliability

3.9.2 Validity

3.10 Norms for interpretation of the level of teachers' mobile learning attitude

3.11 Interpretation of the level of teachers' mobile learning attitude

3.12 Data collection

3.13 Statistical techniques used

3.14 Conclusion and overview of forthcoming chapter

CHAPTER-IV: ANALYSIS AND INTERPRETATION OF THE DATA

4.1 Introduction

4.2 Objectives and hypothesis wise interpretation of data

4.3 Conclusion and overview of forthcoming chapter

CHAPTER-V: SUMMARY, MAJOR FINDINGS, EDUCATIONAL IMPLICATIONS, SUGGESTIONS FOR FURTHER RESEARCH AND CONCLUSION

5.1 Introduction

5.2 Major findings

5.3 Educational implications

5.4 Suggestions for further research

5.5 Conclusion

BIBLIOGRAPHY

APPENDICES

Appendix -I Plagiarism Report

Appendix-II Sample Permission Letter

Appendix- III Personal Data Sheet

Appendix- IV Tool- Teacher Mobile Learning Attitude Scale

Appendix- V Raw Score Data

Appendix- VI Certificate of Seminar Participation

CHAPTER I
INTRODUCTION

CHAPTER I
INTRODUCTION

1.1 INTRODUCTION OF THE STUDY

Information and communication Technology (ICT) in teaching and learning is not a new concept. It may be as old as other technologies such as radios or televisions. However, with the rapid development of emerging technology, such as web technology, ICT integration has increasingly attracted the attention of teachers in the present scenario. Basically, ICT in educational context, are diverse set of technological tools and resources used to create, disseminate, store and manage information and is not particularly reserved for education; it is not a remedy for solving the educational problems either. However, it is a tool that links various teaching and learning communities together in new and different ways, teachers commonly agree that ICT has the potential to improve student learning outcomes and effectiveness if it is used wisely. Specifically, Mobile phone and tablet as an ICT tool has emerged in today's education as learning tool.

Mobile Learning is referred to as "M-learning" or "handheld learning". It is considered to be an extension of e-learning or a type of e-learning which is operated by the use of mobile devices such as cell phone, smart phone, tablet, notebook, etc. over a wireless network. Simply, M-learning can be defined as the practice and usage of mobile technologies for teaching and learning. Lan and Sie (2010) defined M- learning as "a kind of learning model allowing learners to obtain learning materials anywhere and anytime using mobile technologies and the internet". According to Laouris and Eteokleous (2005) the definition of m-learning must view the learner as the one being mobile and not his or her devices. O'Malley et al. (2005) define mobile learning more broadly as "any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies". Today, learning style has been shifted from classroom learning to E-learning and to M-learning. M-learning allow the interaction between the learner and instructor anywhere and anytime. Moreover, it simplifies access to the study materials, online classes, other classroom activities, etc. Also, it helps the teacher with access to a more personal preparation setting and develop technical skills and meet the ever-increasing needs of the education system. It is essential that the fundamentals of mobile learning are planned systematically so that mobile learning is successful and the implementation is efficient

In this study, the researcher intends to study the attitude of secondary teachers towards mobile learning with reference to Dimapur district, Nagaland.

1.2 GEOGRAPHICAL BACKGROUND OF THE STUDY

1.2.1 Nagaland

Nagaland is a state in the North East India. It borders the state of Assam in the East, Arunachal Pradesh and part of Assam to the North, Burma to the East and Manipur to the South. The state capital is Kohima. It has an area of 12,579 square kilometer with a population of 19,80,602 as per the 2011 Census of India, making it one of the smallest states of India.

Nagaland became the 16th state of India on 1 December 1963. The state is inhabited by 16 tribes- Angami, Ao, Chakhesang, Chang, Kachari, Khiamniungan, Konyak, Kuki, Lotha, Phom, Pochury, Rengma, Sangtam, Sumi, Yimchunger, and Zelaing. Each tribe is unique in character with its own distinct customs, language and dress. English is the official language of the state.

According to census 2011 Nagaland has a population of 19.79 lakhs where the number of male and female population is 10.25 and 9.45 lakhs respectively. The sex ratio is 931:1000 i.e. 931 females per 1000 male, which is below national average of 940 as per census 2011.

The literacy rate in Nagaland has seen an upward trend of 79.55% as per 2011 censes. In that, male literacy states at 82.75% while female at 70.01%.

The important natural resources of the state of Nagaland are in the form of its rivers, forest and natural resources. The four main rivers flowing through Nagaland are Dhansiri, Doyang, Dikhu and Tizu. Some of the Tributaries of the mighty Brahmaputra also flow through Nagaland before merging.

The current approach of agriculture is largely traditional jhum (shifting cultivation) practiced by majority of its inhabitants. The state lacks proper infrastructure development for modern agriculture, irrigation, marketing and networking with the rest of the country and communication in terms of road and information technology. though some dynamic initiatives are undertaken by various government departments, NGO’s, etc. to control the detrimental effects of shifting cultivation, attention is needed in various fronts including efforts of checking deforestation, control of wildfire, conservation of biodiversity, proper water harvesting, use of non-conventional energy sources, etc.

1.2.1 Dimapur

Dimapur district was inaugurated as the eighth district of Nagaland in December, 1997, through Government of Nagaland. Earlier it was a sub-division under Kohima district. Besides being referred to as a gateway of Nagaland and Manipur, main commercial activities of the State, is centered around Dimapur, the district headquarter.

Dimapur district in Nagaland is bounded by Kohima district on the south and east, Karbi Anglong district of Assam on the West, the Karbi Anglong and stretch of Golaghat District of Assam, in the west and the north. The only railhead and airport of the State is located in Dimapur, the district headquarter. The National Highway 29 connects the State capital Kohima and also connects the neighboring States of Assam, Manipur, Tripura and Mizoram. Dimapur city is distinct in its character where all the different communities have congregated, portraying a mini India. A large area of the District is in the plains with an average elevation of 260 m above sea level. The climate is hot and humid in the plains during summer (reaching a maximum of 36ºC, with humidity up 93%) while the winter months are cool and pleasant. The average annual rainfall is 1504.7 mm

1.3 SECONDARY EDUCATION IN NAGALAND

Nagaland is the smallest state in the country (India) yet reflects an impressive quality education system. It is progressing towards educational development and the government has been constantly moving towards providing education for all. The schools in Nagaland are majorly affiliated by the Nagaland Board of School Education (NBSE). There are various schemes and policies such as Sarva Shiksha Abhiyan and the Rashtriya Madhyamik Shiksha Abhiyan, Mid-Day Meal and more. These programs aim to work towards the development of education in the state by promoting basic schooling of students and providing basic educational needs in rural areas, women and more.

There are total 724 secondary schools in Nagaland state in which 292 schools are Government and 432 schools are private. (NBSE, 2021). Where, in Dimapur there are 181 secondary schools (151 Private and 30 government school) as per the record of Dimapur district portal as per census 2021, the literacy rate of Nagaland is 79.55%. Mokokchung district in Nagaland recorded the highest literacy rate of 91.62%.

Sl. No	District	Govt. Higher Secondary Schools	Govt. High Schools	Private Higher Secondary Schools	Recognized Private High Schools	Permitted Schools	Total	College (Govt. & Private)
1	Kohima	7	24	30	21	20	102	5
2	Mokokchung	5	37	11	13	6	72	-
3	Tuensang	5	24	2	5	17	53	1
4	Mon	5	18	5	2	32	62	-
5	Phek	4	35	6	12	4	61	-
6	Wokha	3	21	4	7	13	48	1
7	Zunheboto	3	22	5	14	13	57	-
8	Dimapur	7	23	50	14	87	181	8
9	Kiphre	2	15	1	2	10	30	-
10	Longleng	1	13	-	3	5	22	-
11	Peren	2	16	7	3	8	36	-
	Total	44	248	121	96	215	724	15

Table 1.1: Total number of schools in Nagaland: (district & category wise) 2021

Source: https://nbsenl.edu.in/storage/cms/general-info/3.pdf

1.4 ORIGIN OF MOBILE LEARNING

The concept of m-Learning first came into the face of education in 1970s and 1980s. The idea of m-learning was first given by Alan Kay in 1970s. He joined Xerox Corporation's Palo Alto Research Center and with the help of his colleagues they developed "Dynabook", which is a portable and hands on personal computer. It intended to let children have access to the digital world but this mission was futile due to the lack of technological support that time. In 1990s the windows PC, laptops and Personal Digital Assistants (PDAs) were developed. And in 2000s wireless PDAs were developed. From then on, technological establishments started to design "smartphones". The creation of smartphone provided the platform for mobile-learning, and current mobile device innovation pushed mobile learning to project and research status. Many schools and colleges are in support of mobile learning today. They distribute mobile phones, laptops to the students and teachers for educational purposes.

1.5 FUNDAMENTALS OF MOBILE LEARNING

Basic components of mobile learning are learner, teacher, environment, content and assessment.

i. **Learner:** Today learners are prioritized in all teaching and learning activities. Learning goals cannot be met without the growth of the learners and more importantly the teacher's competency builds teachers interests, experiences and needs. It is engaging and flexible so that learners can attain maximum learning and academic success.

ii. **Teacher:** Learning is about transfer of knowledge. Books and media elements store information and teachers convey it in traditional learning environments. On the other hand, M-learning provides a platform through which lessons may be conducted, information and study materials can be circulated via online, video or interactive group chats which ease the workload of the teachers up to great extent.

iii. **Content:** Content should be developed with the help of all stakeholders such as learners, teachers, parents etc. Otherwise teachers cannot get the desired results. Today mobile learning allows contents to be delivered in exciting and interactive way with the help of multimedia and graphics, videos, games and quizzes.

iv. **Environment:** The environment of the teacher plays a crucial role in academic success and positive learning for the learners. M-learning organizes the information systematically and creates virtual environment.

v. **Assessment:** Assessment is a crucial constituent of complete m-learning. Mobile learning platform can provide feedback in the form of grades and points. According to Behera (2011) the assessment should help the learner clear all his doubts based on the course and at the same time, learn a little bit more about the same.

1.6 CHARACTERISTICS OF MOBILE LEARNING

i. **Spontaneous:** It is this freedom in M-learning that allows the students and teachers to learn anywhere and anytime. Wireless technologies such as laptop computers and mobile phones are changing the face of education and altering the traditional classroom-based learning and teaching into anytime and anywhere education (Cavus & Ibrahim, 2009).

ii. **Portability:** M-learning tools are small and portable. Anyone can use it everywhere during their learning activities.

iii. **Blended:** Students can use smart phones for homework, projects or etc. in the education. Blended learning, which combines classroom instruction with m-learning, can maximize the benefits of both face-to-face and online methods (Bonk & Graham, 2006; Ocak, 2010).

iv. **Private:** Meaning, only one learner can learn at a time from one mobile phone for quality learning outcome.

v. **Interactive:** M-learning environments utilizes the latest technologies to bring an interactive learning environment into learning and teaching activities (Cavus & Uzunboylu, 2009). Students are actively learning and engaged with technology which is directly or indirectly developing the technical skill of the user.

vi. **Instant and up to date information:** Internet connected mobile phones delivers to us the up to date information about the nearest and farthest happenings across the globe. Using a mobile tool is all about immediacy.

1.7 MOBILE TECHNOLOGIES FOR M – LEARNING AND MOBILE APPS

Mobile technologies are very prominent and easy to manage and access to information. Mobile devices and technologies that support mobile learning contain E-Book, hand-held game consoles, individual audio players for hearing podcasts, iPod, tablet, mobile, smartphone, PDA in the classroom and outdoors, hand-held audio, and multimedia guides, in museums and galleries, etc.

Mobile applications are software that runs on a mobile device. Mobile applications are easy to use and practical. The mobile apps function suitably on almost every smartphone. Some apps are pre-installed while other desired apps have to be downloaded and installed on the phone for use, there are free and paid apps. The different categories of mobile applications as described below:

i. **Communication:** Internet browsing, email, messenger, social networking

ii. **Games:** Puzzle, brainteasers, strategy, cards, action

iii. **Multimedia**: Graphics, Image, presentations viewers, video players, audio players

iv. **Productivity:** Calendars, calculators, notepad, memo

v. **Travel:** City guide, currency converter, translators, GPS, maps, weather forecast

vi. **Utilities:** Profile manager, address book, task manager, call manager, file manager.

1.8 MOBILE APPS FOR TEACHING AND LEARNING

i. **Smart Dot:** It's an I Device-based laser pointer that functions as a remote control for PowerPoint and Keynote presentations.

ii. **Edu creations Interactive Whiteboard:** This is an easy-to-use app for drawing and diagramming in the classroom.

iii. **Attendance:** Attendance helps to keep track of the attendance of students in the classroom.

iv. **Grade Book for Professors:** This is a good app for organizing and tracking student grades. Both free and paid versions are available.

v. **Percent Calculator:** Get grades done smarter, better, faster, and stronger using this quick and easy calculator just for figuring out percentages.

vi. **Voice Recorder:** Perfect for Android users wanting to make permanent records of lectures for students who can't make it to class for whatever reason.

vii. **iTalk Recorder**: This app helps keep an audio record of the classroom discussions using the iPhone!

viii. **Blackboard Mobile Learn:** Rather than an app for a classroom, Blackboard practically provides a classroom for an app, available on almost all smartphone and tablet platforms.

ix. **Course Smart**: Subscribers to this digital textbook service enjoy unlimited access to thousands of digital reads on their phones and tablet devices.

1.9 ATTITUDE

Attitudes are learned predispositions towards aspects of our environment. They may be positively or negatively directed towards certain people, issues or institutions. An attitude may involve a prejudice, in which we prejudge an issue without giving evidence. If one is prejudiced against a person who is accused of a crime, one may regard him as guilty regardless of the evidence. One also can be prejudiced in favour of something. When the word “prejudice” is used without qualification, however, it customarily refers to a negative judgement based on inadequate grounds. An attitude usually is considered as consisting of three basic components - thinking, feeling and reacting. The first aspect pertains to belief; it involves the thoughts a person has about the topic in question. The second aspect is related to

value; here we are talking about whether the person feels attracted, repelled or is neutral regarding the topic in question. The third element is a predisposition to behaviour. According to Alloport (1985), attitude is defined as the mental status of readiness organised through experience upon the individual's response to all objects and situation with which it is related. Attitude are defined as a mental predisposition to act that is expressed by evaluating a particular entity with some degree of favour of disfavours. Attitude may be considered as hypothetical constructs in which a person's diverse thoughts, feeling and tendencies to act are arranged into a more or less coherent pattern.

According to Morgus (1934), "Attitude is literally mental postures, gender for conduct to which each new experience is referred before is made".

According to Cantrill (1934), "Attitude is more or less permanent enduring state of readiness of mental organisation which predisposes an individual to react in a characteristic way to any subject or situation with which it is related. Thus, attitude may be regarded as a readiness or preparation for response. In the words of Edwards (1969), "An attitude may be defined as learned emotional response set for or against something".

According to Anastasi, Anne (1973), "Attitude is defined as a tendency to react favourable or unfavourable towards a designated Class of stimuli such as national or racial group, a custom or an institution". According to Woods Worth (1989), "Attitude are a more or less stable set or disposition of opinion, interest or purpose, involving expectancy of a certain king of previous experience and readiness is an appropriate response". The main aim of education is to modify the behaviour of the child according to the needs and expectancy of the society behaviour is composed of so many attributes. One of these important attributes is attitude.

1.10 CHARACTERISTICS OF ATTITUDE

i. It provides for quantitative measure on a uni-dimensional scale of continuum.
ii. It uses statements from the extreme positive position to extreme negative position.
iii. It generally uses a five-point scale as: Strongly agree (SA), Agree (A), Undecided (U), Disagree (D) and strongly disagree (SD). The individual gets the score as the sum of item credits.
iv. It may require the judges to pile up the given statements and compute the scale values according to the percentage of judges who place each statement in the different categories. It gives the individual a score on the basis of the median scale values of the statements he has endorsed.

v. It is usually standardized and norms are worked out. 6. It disguises the attitude object rather than directly asking about the attitude on the subject.

1.11 FUNCTIONS OF ATTITUDES

Attitudes offer possibilities for achievement and are an important motivator of behaviour while also affecting all human values. They affect learning, besides revealing behaviour. In fact, in an educational setting dealing with the attainment of educational objectives, a favourable attitude motivates the student to do well in the particular subject of study, whereas negative attitudes can affect the degree of learning which would in turn hamper one's achievement. Crow & Crow (1964) for instance argues that a person's background of learning, his attitudes and interest exercise a potential effect upon the degree of learnability. Remmers (1954) further states that for practical reasons, attitudes and interests are identical for a loss of interest. This leads to the formation of negative attitudes towards the concerned area of learning. McGuire (1969) discusses four types of adaptive functions, which are not always mutually exclusive. Firstly, attitudes according to McGuire have utilitarian functions for they may be disposed towards objects and paths that are instrumental in achieving valued goals. 28 As instrumental functions attitudes are a means to other ends. They facilitate the achievement of goals, retrospectively on the basis of past pleasant experiences or in prospective anticipation of future awards. Attitudes besides function as ways of thinking, of understanding and as a means to relieve psychological pressure and emotional release. This function of attitude can be considered as both self-expressive and self-assertive. It is adopted to bolster or justify one's behaviour, to defend one's ego as it were. McGuire also goes on to talk of economy functions where like all categories and generalizations attitude provides a simplification of a complex world. It also provides certain guidelines as to the most appropriate behaviour in a new situation. Festinger (1957) also draws attention to the supportive function of attitude. He says that a change in attitude often follows rather than precedes a change in behaviour. Again, according to Gardener & Lambert (1977), the group specific attitude or the positive attitude towards the self, towards the native language group and the target language group leads to a high integrative motivation, which enhances proficiency. Negative attitudes, they claim lead to a decreased motivation, which in all likelihood will result in an unsuccessful attainment of proficiency. Attitudes therefore have a profound influence on the rate and ultimate level achieved in second language learning - a principal cause for more or less successful teaching and learning. The function of attitude is therefore important because from the above discussion, attitudes can to a certain point be

considered as a causative factor, which either makes a person favourably or unfavourably, inclined towards something.

1.12 DEFINITION OF KEY TERMS

i. **Attitude:** It is the positive or negative degree of effect associated with a certain subject. In the present study attitude refers to the inclination of teacher's approach towards mobile learning.

ii. **Secondary school teachers:** In the present study, the teacher refers to individuals teaching in government and private secondary schools.

iii. **Mobile learning:** It is the delivery of learning content or learning support with mobile phones, PDAs or tablets.

iv. Demographic variables:

a) Gender: Male and female

b) Types of School: Government and private secondary schools

c) Qualifications: Graduate and post graduate

d) Work experiences: In the present study less than 2 years of teaching experience are grouped in less experienced teacher, 3-4 years as experienced teacher and 5 years and above as highly experienced teacher.

1.13 JUSTIFICATION OF THE STUDY

After examining various researches that have been carried out the researcher has formulated the following justifications:

i. The attitude of teachers toward mobile learning with respect to their gender and work experience was positive and found favorable but the problems of incorporating Mobile learning in mainstream education and training were noticed. In spite of these hindrances, the teacher community is willing to accept mobile learning.

ii. Also, it was found that mobile learning is considered as an important tool in the present educational system. In the present scenario, instruction is no longer confined to the four walls of classroom and can take place anytime and anywhere.

iii. It was found that only few studies have been conducted particularly in Nagaland in relation to electronic learning and no research was carried out on mobile learning.

iv. Through this study, the attitude of secondary school teachers towards mobile learning with respect to gender, types of school, qualifications and work experiences can be brought to light.

1.14 STATEMENT OF THE PROBLEM

As use of educational technologies, electronic learning and mobile learning is the need of the hour and with the ever-increasing demand of the community, learners, parents and teachers in the teaching learning process the study intends to find the attitude of secondary school teachers towards mobile learning with respect to their gender, types of school, qualifications and their work experiences.

To precisely propose the problem, the present study is titled **"Attitude of Secondary school teachers towards mobile learning in relation to certain demographic variables".**

1.15 VARIABLES OF THE STUDY

Dependent Variables: Attitude towards mobile learning

Independent variables: Gender, Qualifications, types of school and work experiences

1.16 OBJECTIVES OF THE STUDY

The following are the objectives of the present study:

i. To determine the level of attitude of secondary school teachers towards mobile learning
ii. To study the attitude of secondary school teachers towards mobile learning with respect to gender
iii. To study the attitude of secondary school teachers towards mobile learning with respect to types of school
iv. To study the attitude of secondary school teachers towards mobile learning with respect to qualifications
v. To study the attitude of secondary school teachers towards mobile learning with respect to work experiences

1.17 HYPOTHESIS OF THE STUDY

i. There is no significant difference in the level of attitude of secondary school teachers towards mobile learning
i. There is no significant difference in the attitude of male and female secondary school teachers towards mobile learning.
ii. There is no significant difference in the attitude of government and private secondary school male teachers towards mobile learning.

iii. There is no significant difference in the attitude of government and private secondary school female teachers towards mobile learning.

iv. There is no significant difference in the attitude of graduate and post graduate secondary school male teachers towards mobile learning.

v. There is no significant difference in the attitude of graduate and post graduate secondary school female teachers towards mobile learning.

vi. There is no significant difference in the attitude of secondary school teachers towards mobile learning with respect to their work experiences

1.18 DELIMITATION OF THE STUDY

i. The study was delimited to secondary school teachers only.

ii. The study was delimited to Dimapur district of Nagaland only.

iii. The study was delimited to attitude of teachers towards mobile learning only.

1.19 Conclusion and Overview of Forthcoming Chapter

ICT is one of the developments of the twentieth century. It is an essential tool for assimilating, processing and disseminating information. Mobile learning as a powerful innovation provides powerful support for education. It provides facilities for lifelong professional and personal development. It provides capabilities required for teachers related to content, pedagogy, technical issues, social issues, networking and collaboration. It enables the students to complete their courses according to their convenience. This interactive nature of internet creates incredible interest in learning. Mobile learning has immense power to enhance personalized learning and make the students become explorers of information and self-governing worker. The internet services are beneficial to both the teachers and students at all levels of education. This study is an attempt to study the Attitude of Secondary School Teachers Towards Mobile Learning in Relation to Certain Demographic Variables and the outcome of the research would help the secondary school teachers and the Department of School Education to cope with the challenges of the 21st century. In the forthcoming chapter the reviews of related literatures will be discussed

CHAPTER II
REVIEW OF RELATED LITERATURE

CHAPTER II

REVIEW OF RELATED LITERATURE

2.1. INTRODUCTION

Being able to ascertain what is known about a subject area, and by correlating what is not known, is a significant skill of the learners and researchers. The review of literature permits the researcher to familiarize the researcher with the current and up-to-date knowledge in the area in which the research is to be carried out. It gives an understanding of the research methodology and the way one should head towards an inference of the study and also to avoid copying and make research work a perfect and unique one, it is very essential for the researcher to go through the related literature.

This chapter deals with a number of studies done by the researchers related to the usage and awareness of Information and Communication Technology in the teaching learning process. The study is reviewed in two sections, viz. studies done in abroad and studies done in India

2.2. PURPOSE OF REVIEW OF LITERATURE

The purpose of literature review is to:

i. Provide groundwork of knowledge on the topic.
ii. Allow the reader to be updated with the status of research in the area.
iii. Extend research investigative tools and to advance in research methodologies.
iv. Identify and discover the need for additional researches.

2.3. NEED OF REVIEW OF LITERATURE

The need of literature review is to:

i. To describe and limit the research.
ii. To place the study in a chronological perspective.
iii. To keep away from unnecessary replication.
iv. To evaluate and come up with potential research methods.
v. To relate the inferences to previous knowledge and suggest additional/ further research.

2.4. INTERNATIONAL STUDIES

Nachimathu & Kumari (2007) conducted a research on "Modern ICT trends in teaching technology". The result showed that most of the teacher educators are not able to use media technologies due to lack of training. He suggested that the "teachers" have to be equipped with the skills and abilities from time to time to handle the latest technology as the quality and competence of "teachers" affect instruction with a strong impact on student learning.

Özdamlı & Cavus (2011) conducted a study on basic elements of mobile learning. Mean, SD and range were calculated to gauge the level of perception. The results indicated low levels of perception. For understanding the difference in perception department wise ANOVA was applied and no significant difference was found in the perception. Similarly, t-test was applied to measure the difference in perception based on gender and again no significant difference was found in the perception of males and females. Prospective teachers gave many opinions and most of them were favourable towards mobile learning.

Lai (2011) studied on "The Influence of Adult Learners' Self-Directed Learning Readiness & Network Literacy on Online Learning Effectiveness: A Study of Civil Servants in Taiwan". pointed in his study that online Learning has become a favourite choice for providing training and development needs in government organizations because it provides a cost-effective and timely learning vehicle to meet the need of continuous education and training for the civil servants working at different locations.

Wanjala, et., al. (2011) conducted a study on "Significant Factors in Professional Staff Development for the Implementation of ICT Education in Secondary Schools" and found that few teachers are using ICTs to manage the classroom and to integrate technology into several of the content areas. Professional development options were varied. They indicated that most teachers use trial and error, learn through course work taken at colleges or universities, and support other or receive personal or expert support as significant methods of learning how to use Information Communication Technologies.

Rengarajan & Senthilnathan (2012) conducted a study on Teacher educators Attitude towards e-learning. The major objective of the study is to assess teacher educators' attitude towards e-learning. The normative study technique has been adopted and 160 teacher educators from 20 colleges have been chosen as sample through random sampling technique. A standardized questionnaire in five-point scale aimed at the assessment of e-learning attitude was administered. The collected data was analyzed through chi-square analysis. The major findings of the study were nearly 55 percent of the sample felt that e-learning does not make teaching more difficult. More than 23.13% of the teacher educators have 2 to 4 years'

experience in computer and only a very few of them 13.13% have less than one-year experience in computer. When it comes to the length of experience with the Internet, 25.62% of the teacher educators who formed the sample had no experience with the Internet. More than 60 percent of the sample held a negative view about e-learning possibility of interaction with students.

Ismail, et., al. (2013) In Malaysia, performed a case study on Malaysian teachers' mobile phone acceptance and readiness. They found that the acceptance among respondents in terms of awareness and motivation to usage of technology in education, training and courses related to technology application in the classrooms, the design of content for their training, technological support and facilities was high and positivity was observed but their readiness to use the technology was found to be at a considerably low level. However, there was a significant positive correlation between teachers' readiness for mobile learning with their awareness and motivation to use technology in education. They concluded that teachers' readiness for mobile learning would most likely increase if their awareness and motivation to use technology was also increasing.

Emran, et., al. (2016) have conducted a study entitled as "Investigating attitude towards the use of mobile learning in higher Education". Objectives of the study was to explore students and educators' attitudes towards the use of Mobile learning in higher educational universities within Oman and UAE. Their study revealed that the total average score of the students' attitudes was positive and usefulness was high. It also revealed that there are statistically significant differences among the students' attitudes with regard to their age.

Mashau (2016) conducted a survey on "Issues Affecting the Adoption and Usage of Mobile Instant Messaging (MIM) in Semi-Rural Public Schools of South Africa for Learning". The quantitative method was adopted for investigating the factors influencing the use of instant messaging in South African rural public schools. The tool used for collecting data was closed-ended questionnaire. The sample selected for the study was Grade 12 students who opted Mathematics as one subject. 202 samples were selected from grade 12 students in which 98 were male and 104 were female. The findings of this study indicate that most respondents in South African semi-rural public schools have never used MIM for learning mathematics because they have never heard about the MIM application for learning. The results indicate that there is no enough awareness of using MIM for learning

Baek (2017) studied on "Teachers Attitude toward Mobile learning in Korea" where the investigator adopted Survey Method for the study. The main objective of the study was to find out the teacher's attitude towards mobile learning in Korea. The study reveals that the

experienced teachers with more than 15 years had more attitudes when compared to that of less experienced. Female teachers have more significant attitude than that of male.

2.5. NATIONAL STUDIES

Shashaani (1997) conducted a study on "Gender differences in computer attitudes and use among college students" and found that females were less interested in computers and less confident than males and further that females lack of interest and low self-confidence regarding computers are related to some extent.

Pareek (2005) conducted a study on computer curriculum in teacher in education program. The study was a survey type in and the sample comprised of 50 college students, 5 teachers and 8 principals from each university affiliated colleges. The study revealed that teacher trainees, teachers and principals have a positive towards computer and the usage of computer related programmes. These learning programmes were not carried out for different educational activities.

Vrana (2005) conducted a study on "Analysing academic staffs and students' attitudes towards the adoption of e-learning", the study reveals the skills in e-learning and the attitude of faculty and students for e-learning and educational technologies. He found that the general positive opinion of e-learning and educational technologies, the recognition of difficulties by both groups in the use of e-learning and technologies and the expression of the need to be supported by the institution in their effort, the positive disposition of faculty to use educational technologies and the relatively good level of their aptitude in e-learning, the fact the students appear more conservative towards e-learning and educational technologies. The fact that there are no patterns of correlation between variables, faculty take firm positions because they have better knowledge, students on the other hand, lack the e-learning experience and may be less well informed about e-learning and educational technologies and therefore they hesitate to express firm opinion.

Vandana & Rajnewa (2009) conducted a study to examine the "School teacher's attitude towards ICT". "The main findings of the study were that private and secondary school "teachers" exhibited comparable attitude towards ICT. Teaching belonging to different "academic streams", viz, language, science, mathematics and social sciences exhibited comparable attitude towards ICT. They found the school "teachers" exhibited positive attitude towards ICT. Therefore, ICT must be given higher priority in teacher education curriculum. So that the future "teachers" can cope with various challenges in education system, more specifically the new roles of "teachers" in ICT based teaching learning system.

Also, in-service "teachers" must be given training to teach in ICT based instructional settings".

Sridevi (2010) conducted a study to examine the "Attitude of secondary school teacher's towards e-learning". Attitude towards e-learning scale was developed and was administered to 120 secondary school teachers. The main findings of the study are: (a) It is found that only 34% of teachers were having positive attitude towards e-learning. (b) Teachers of unaided schools showed more favorable attitude compared to Aided and Government school teachers. (c) Urban teachers have better favorable attitude compared to rural teachers. (d) With regard to the gender, male teachers have a better attitude compared to female teachers. (e) Post Graduate teachers have a better favorable attitude than trained graduate teachers. (f) It was found that science teachers have a highly favorable attitude than the arts teachers.

Kumar & Rajesh (2011) focused a study on "The attitude of teachers of higher education towards e-learning". The results of this study showed that the teachers have a favorable attitude towards e-learning as well teachers who are familiar about computer and ICT differ in their attitude towards e-learning when compared to the teachers who are not familiar with technology. Attitude, plays a vital role in using technology as a strong tool for a positive change. There must be programs at higher educational institutions which could focus on developing a positive attitude among teachers towards e-learning and ICT.

Behera (2013) has conducted a study entitled as "E- and Mobile learning: A Comparative Study." The Researcher highlights the areas of study on the concept, characteristics, advantages and disadvantages, similarities and significance of E-learning and Mobile learning.

Khan (2016) conducted a case study "Investigation of Teachers attitude in E-Learning" with 85 teachers teaching in 8 major faculties in Punjab University Chandigarh and it was found that favorable attitude of teachers was shown towards e-learning. No significant gender difference in teachers' attitude was found towards computer and E-learning.

Akaram & Pachaiyappan (2017) conducted a study on "Attitude towards Mobile learning among Prospective Teachers" with its objective to find out the attitude of prospective teachers towards mobile learning the researcher used an attitude towards mobile learning scale developed and standardized by P. Pachaiyappan (2015). The 337 sample were collected from govt. and private B.Ed. colleges in Tiruvallur district of Tamil Nadu using mean, SD, one-way ANOVA test and t-test. The research resulted that the government B.Ed. institutions have positive attitude towards mobile learning and most of the students had moderate level of

attitude towards mobile learning it was also found that male students had positive attitude compared to the counterpart.

Table 2.1: Presentation of reviews year wise

Sl. No.	Year	Author	Title of study	Findings
1	1997	Shashaani	Gender differences in computer attitudes and use among college students	**Females were less interested in computers and less confident than males and further that females lack of interest and low self-confidence regarding computers are related to some extent.**
2	2005	Pareek	A study on computer curriculum in teacher in education program	**Teacher trainees, teachers and principals have a positive towards computer and the usage of computer related programmes**
3	2005	Vrana	Analysing academic staffs and students' attitudes towards the adoption of e-learning	**He found that there was general positive opinion of e-learning and educational technologies, both groups expressed the need and support in the use of e-learning and technologies by the institution in their effort.**
4	2007	Nachimathu & Kumari	Modern ICT trends in teaching technology	**Most of the teacher educators are not able to use media technologies due to lack of training.** **Suggested that the teachers have to be equipped with the skills and abilities from time to time to handle the latest technology**
5	2009	Vandana &	School teacher's	**private and secondary school teachers**

		Rajnewa	attitude towards ICT	**exhibited comparable attitude towards ICT. School teachers exhibited positive attitude towards ICT. ICT must be given higher priority in teacher education curriculum so that the future teachers can cope with various challenges in education system**
6	2010	Sridevi	Attitude of secondary school teacher's towards e-learning.	**It is found that only 34% of teachers were having positive attitude towards e-learning, teachers of unaided schools showed more favorable attitude compared to Aided and Government school teachers, urban teachers have better favorable attitude compared to rural teachers, male teachers have a better attitude compared to female teachers. Post Graduate teachers have a better favorable attitude than trained graduate teachers. It was found that science teachers have a highly favorable attitude than the arts teachers.**
7	2011	Kumar & Rajesh	The attitude of teachers of higher education towards e-learning	**The teachers have a favorable attitude towards e-learning as well teachers who are familiar about computer and ICT differ in their attitude towards e-learning when compared to the teachers who are not familiar with technology.**
8	2011	Özdamlı & Cavus	basic elements of mobile learning.	**Prospective teachers gave many opinions and most of them were favourable towards mobile learning.**

9	2011	Lai	The Influence of Adult Learners' Self-Directed Learning Readiness & Network Literacy on Online Learning Effectiveness: A Study of Civil Servants in Taiwan	**online Learning has become a favourite choice for providing training and development needs in government organizations because it provides a cost-effective and timely learning vehicle to meet the need of continuous education and training for the civil servants**
10	2011	Wanjala, et., al.	Significant Factors in Professional Staff Development for the Implementation of ICT Education in Secondary Schools	**few teachers are using ICTs to manage the classroom and to integrate technology into several of the content areas. Professional development options were varied**
11	2012	Rengarajan & Senthilnathan	Teacher Educators Attitude towards e-learning	**More than 60 percent of the sample held a negative view about e-learning possibility of interaction with students.**
12	2013	Ismail, et., al.	A case study on Malaysian teachers' mobile phone acceptance and readiness.	**Acceptance, awareness and motivation to usage of technology in education was high and positivity was observed but their readiness to use the technology was found to be at a considerably low level. They concluded that teachers' readiness for mobile learning would most likely increase if their awareness and motivation to use**

				technology was also increasing.
13	2013	Behera	E- and Mobile learning: A Comparative Study	**The Researcher highlights the areas of study on the concept, characteristics, advantages and disadvantages, similarities and significance of E-learning and Mobile learning.**
14	2016	Khan	Investigation of Teachers attitude in E-Learning	**favorable attitude of teachers was shown towards e-learning and no significant gender difference in teachers' attitude was found towards computer and E-learning.**
15	2016	Emran, et., al.	Investigating attitude towards the use of mobile learning in higher Education	**Their study revealed that the total average score of the students' attitudes was positive and usefulness was high and there are statistically significant differences among the students' attitudes with regard to their age.**
16	2016	Mashau	Issues Affecting the Adoption and Usage of Mobile Instant Messaging (MIM) in Semi-Rural Public Schools of South Africa for Learning	**Most respondents in South African semi-rural public schools have never used MIM for learning mathematics because they have never heard about the MIM application for learning. The results indicate that there is no enough awareness of using MIM for learning**
17	2017	Baek	Teachers Attitude toward Mobile learning in Korea	**The experienced teachers with more than 15 years had more attitudes when compared to that of less experienced.**

				Female teachers have more significant attitude than that of male.
18	2017	Akaram & Pachaiyappan	Attitude towards Mobile learning among Prospective Teachers	**The research resulted that the government B.Ed. institutions have positive attitude towards mobile learning and most of the students had moderate level of attitude towards mobile learning it was also found that male students had positive attitude compared to the counterpart.**

2.6. CONCLUSION AND OVERVIEW OF FORTHCOMING CHAPTER

In this chapter, the research studies conducted in abroad and India related to Mobile learning and ICT have been reviewed for understanding the present problem. The major conclusions drawn from these studies are highlighted and the research gap of the study has been identified. The review of related literature indicates the need for investigation of research endeavors in the area of study. In the forthcoming chapter i.e. Methodology, the research plan and approach of research will be discussed in detail.

CHAPTER III
METHODOLOGY

CHAPTER III

METHODOLOGY

3.1. INTRODUCTION

Methodology is the plan, structure and approach of research envision to obtain answers to research questions and to control discrepancy. Methodology is the overall scheme of the research. Methodology furthermore, tells what type of statistical analysis to use and outlines the potential conclusions to be drawn from the statistical analysis.

The investigator has adopted the survey method of research to study the attitude of secondary school teachers towards mobile learning, selecting the sample with simple random sampling technique. This technique allows every item in the population to have an even probability and likely to be selected in the sample. Because it was fair and found suitable, the random sampling technique was selected.

3.2. METHOD OF STUDY

Descriptive research is aimed at casting light on current issues or problems through a process of data collection that enables them to describe the situation more completely than was possible without employing this method. In its essence, descriptive studies are used to describe various aspects of the phenomenon. In its popular format, descriptive research is used to describe characteristics and/or behaviour of sample population.

Descriptive survey method is used to carry out the study. This method rightly suits the character of the study carried out and it will be helpful in creating genuine descriptions of the existing situation and attitude of secondary school teachers towards Mobile learning

3.2.1 Descriptive Survey Method:

Descriptive Survey research involves questions relevant to the subject of the research. The survey questions are then distributed to the audience in hopes of receiving their honest response.

It is used by various fields for various purposes in social research, market research, health research, etc.

3.2.2 Steps involved in Descriptive Research

i. Define Objective of the Research

ii. Establish who will participate

iii. Decide how to distribute the Survey

iv. Analyze survey result

v. Report the survey

vi. Access to a wide audience with common characteristics

vii. Administer a large no. of respondents

viii. Respondents can complete the survey at their convenience

ix. Surveys can be anonymous

x. Real-time data analyses

3.2.3 Some of the characteristics of Descriptive Research

i. **Gather Quantitative Data:** The information collected is quantifiable in nature which eases the process to statistically analyze them.

ii. **Provides Qualitative Data**: It can also provide you with qualitative information to describe the research problem in depth.

iii. **No Variable Control or Manipulation:** This allows you to gather honest responses from respondents. The flow of the survey is natural.

iv. **Data for Further Research:** The data you gather from a Descriptive Survey can be analyzed and used for other related issues or research. Also, the data helps to conduct further surveys on specific subjects.

3.3. POPULATION AND SAMPLE OF THE STUDY

All teachers working in secondary schools of Nagaland is the population of the present study and the researcher took Dimapur district of Nagaland as its sample and employ simple random sampling technique for selecting the sample.

Simple random sampling is the randomized selection of a small segment of individuals or members from a whole population. It provides each individual or member of a population with an equal and fair probability of being chosen. The simple random sampling method is one of the most convenient and simple sample selection techniques.

The representative portion of the population is called a sample. A sampling frame is generally the list of sampling units from which the sample can be selected at each sampling stage (Aggarwal, 2008). There are 181 secondary schools (151 Private and 30 government school) as per the record of Dimapur district portal. Again, researcher will take proportionately 20% of schools randomly i.e. 30 private schools and 6 govt. schools. and from these school's researcher will take 200 teachers as sample for the present study.

3.4. DESCRIPTION OF THE TOOL

The researcher used Teacher Mobile Learning Attitude Scale (TMLAS) prepared by P. Pachaiyappan and S. Rajkumar (2015) which is a standardized tool for collection of data in the present study.

3.4.1 First Draft of the Scale

Initially, the constructors prepared 80 statements regarding Teachers' Mobile Learning Attitude and submitted these 80 statements to a set of 11 professors (Education, 03, Psychology, 03, Sociology, 02 and Computer Science, 03) for their scrutiny and approval. It was decided that only those statements will be retained which have 80% unanimous agreement amongst the experts.

Experts agreed unanimously on 66 statements. As such, 14 statements were rejected and 66 statements were retained.

3.4.2 Second Draft of the Scale

The second draft of the scale had 66 statements. For seeking opinion/ response/answer from the subjects, it was decided to have a Likert type Five-point alternatives, viz., Strongly Disagree, Disagree, Undecided, Agree and Strongly Agree.

This second draft of the scale was administered on a sample of 120 B.Ed. pupil teachers of Government T. T. College in Chennai and 100 teachers randomly selected from Chennai and

Thiruvallur districts of Tamil Nadu, who were working in Senior Secondary Schools and had a minimum of five years' experience.

3.5 SCORING SYSTEM

The scoring is on five-point alternatives, viz., Strongly Disagree, Disagree, Undecided, Agree and Strongly Agree

Nature of Item	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Positive	1	2	3	4	5
Negative	5	4	3	2	1

Table 3.5a Scoring system for the scale

3.6 ITEM ANALYSIS

The total sample was 220. For the purpose of Item Analysis, the answers of the 220 subjects were scored and arranged in descending order from the highest to the lowest scores. Out of this 27% from the highest scorers and 27% from the lower scorers were selected (60+60=120) of these 120 subjects, scores, item-wise item analysis was done of the 66 items.

3.7 FINAL DRAFT

The final draft of the scale had 62 items, 49 positive and 13 negative. Serial number wise distribution of the items is presented in Table 3.3.

3.8 SERIAL NUMBER WISE DISTRIBUTION OF ITEMS

Sl. No.	Type of Items	S. No. Of Items	Total
1	Positive	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 13, 14, 15, 16, 17, 18, 19, 20, 21 22, 23, 27, 28, 30, 32, 33, 34, 35 36, 37, 38, 40, 45, 46, 47, 48, 50 52, 53, 54, 55, 56, 58, 59, 60, 61 62.	49
11	Negative	24, 25, 26, 29, 31, 39, 41, 42, 43 44, 49, 51, 57.	13
		Grand Total	**62**

The scoring system remained the same as presented in the table above. For the purpose of smooth scoring, before the serial number of each item P for Positive and N for Negative type of item has been printed as prefixed. The minimum and maximum range of Score is 62-310.

3.9 STANDARDIZATION OF THE SCALE

The final draft of the Teachers' Mobile Learning Attitude Scale with 62 items was administered on the randomly selected sample of 240 B.Ed. Student-teachers of Government, Aided and Private College of Chennai and Thiruvallur districts of Tamil Nadu State and 220 Teachers working in Senior Secondary Schools with minimum 5 years' experience from Government, Aided or Private Schools of Chennai and Thiruvallur districts of Tamil Nadu State.

3.9.1 Reliability

The reliability of the scale was established by calculating Cronbach's alpha r, which was 0.940.

The second type of Reliability was calculated by Split-half (odd-even) method.

The r found was 0.86.

As such both the results are significant at 0.01 level of significance.

3.9.2 Validity

The scale's content validity was established by:

i. Experts' observation, review and unanimity on selected/rejected items.

ii. The second method adopted was of the Item Analysis which was also done on seeming large sample, and on the basis of the item analysis the final draft of the scale was selected, rejecting discriminating values. As such the scale could safely be taken as a valid tool.

3.10 INTERPRETATION OF THE LEVEL OF TEACHERS' MOBILE LEARNING ATTITUDE

Raw Score	Z Score	Raw Score	Z Score	Raw Score	Z Score	Raw Score	Z Score
151	-2.47	176	-1.24	201	-0.02	226	+1.19
152	-2.42	177	-1.19	202	+0.02	227	+1.24
153	-2.37	178	-1.14	203	+0.07	228	+1.29
154	-2.32	179	-1.10	204	+0.12	229	+1.34
155	-2.27	180	-1.05	205	+0.17	230	+1.39

156	-2.22	181	-1.00	206	+0.22	231	+1.44
157	-2.17	182	-0.95	207	+0.26	232	+1.49
158	-2.12	183	-0.90	208	+0.31	233	+1.54
159	-2.07	184	-0.85	209	+0.36	234	+1.59
160	-2.03	185	-0.80	210	+0.41	235	+1.63
161	-1.98	186	-0.75	211	+0.46	236	+1.68
162	-1.93	187	-0.70	212	+0.51	237	+1.73
163	-1.88	188	-0.66	213	+0.56	238	+1.78
164	-1.83	189	-0.61	214	+0.61	239	+1.83
165	-1.78	190	-0.56	215	+0.66	240	+1.88
166	-1.73	191	-0.51	216	+0.70	241	+1.93
167	-1.68	192	-0.46	217	+0.75	242	+1.98
168	-1.63	193	-0.41	218	+0.80	243	+2.03
169	-1.59	194	-0.36	219	+0.85	244	+2.07
170	-1.54	195	-0.31	220	+0.90	245	+2.12
171	-l .49	196	-0.26	221	+0.95	246	+2.17
172	-1.44	197	-0.22	222	+1.00	247	+2.22
173	-1.39	198	-0.17	223	+1.05	248	+2.27
174	-1.34	199	-0.12	224	+1.10	249	+2.32
175	-1.29	200	-0.07	225	+1.14	250	+2.37

3.11 NORMS FOR INTERPRETATION OF THE LEVEL OF TEACHERS' MOBILE LEARNING ATTITUDE

Sl. No.	CI	Range of z scores	Grade	Description
1	Below 160	-2.01 & below	G	Extremely Negative
2	161-175	-2.00 to -1.26	F	Highly Negative
3	176-191	-1.25 to -0.51	E	Negative
4	192-211	-0.50 to +0.50	D	Average/ Moderate Positive
5	212-227	+0.51 to +1.25	C	Above Average Positive
6	228-242	+1.26 to +2.00	B	Highly Positive
7	243 Above	+2.01 & above	A	Extremely Positive

3.12 DATA COLLECTION

Data were collected in two forms, in person visited the schools and through google form. After taking proper permission from the Principal, Head teacher, Head master and Teacher in charge of the targeted schools, the researcher went to the staff room to meet the teachers individually and introduce them with the topic and purpose of the research being carried out in detail while knowing their perspectives during the conversation. The attitude scale was handed out to the teachers and enough time was given for reflecting on their responses. Some responses were collected through google form because of covid pandemic situation during the time of carrying out research. The test was administered strictly and complete confidentiality was maintained during and after the process of data collection.

3.13 STATISTICAL TECHNIQUES USED

Appropriate statistical techniques were used to draw out inferences from the raw data collected for this study. The following techniques were used in the present study for the analysis and interpretation of data collected:

i. In the first phase, the simple descriptive statistical techniques like computation of mean, standard deviation, were used to ascertain the normality of the distribution of various scores of the concerned variables.

ii. In the second phase T-test was applied to test the significance of difference in the mean scores of variables.

$$t = (\bar{x} - \mu) / (s / \sqrt{n})$$

where,

- $\bar{x}$ = Observed Mean of the Sample
- μ = Theoretical Mean of the Population
- **s** = Standard Deviation of the Sample
- **n** = Sample Size

When two samples are to be compared, then a two-sample t-test is used, and its formula is expressed using respective sample means, sample standard deviations, and sample sizes. Mathematically, it is represented as,

$$t = (\bar{x}_1 - \bar{x}_2) / \sqrt{[(s^2_1 / n_1) + (s^2_2 / n_2)]}$$

Where,

- $\bar{x}_1$ = Observed Mean of 1st Sample
- $\bar{x}_2$ = Observed Mean of 2nd Sample
- s_1 = Standard Deviation of 1st Sample
- s_2= Standard Deviation of 2nd Sample
- n_1 = Size of 1st Sample
- n_2 = Size of 2nd Sample

iii. In the third stage, Chi-Square was used to significant difference in the level of Attitude of Secondary School Teachers Towards Mobile Learning. The Chi-Square is denoted by χ^2. The chi-square formula is:

$$\chi^2 = \sum(O_i - E_i)^2/E_i$$

where,

- O_i = observed value (actual value)
- E_i = expected value.

iv. In the fourth phase, ANOVA test was applied to test the significant difference in the mean scores of more than two samples.

v. The results were presented graphically in the form of bar diagrams.

3.14 CONCLUSION AND OVERVIEW OF FORTHCOMING CHAPTER

The methodology and research design has been discussed here. The detail structure of how the research will be carried out and what tools have been used for attaining the research questions has been discussed. In the forthcoming chapter, data will be analyzed using different statistical techniques and data will be interpreted accordingly.

CHAPTER IV

ANALYSIS AND INTERPRETATION OF DATA

CHAPTER IV

ANALYSIS AND INTERPRETATION OF DATA

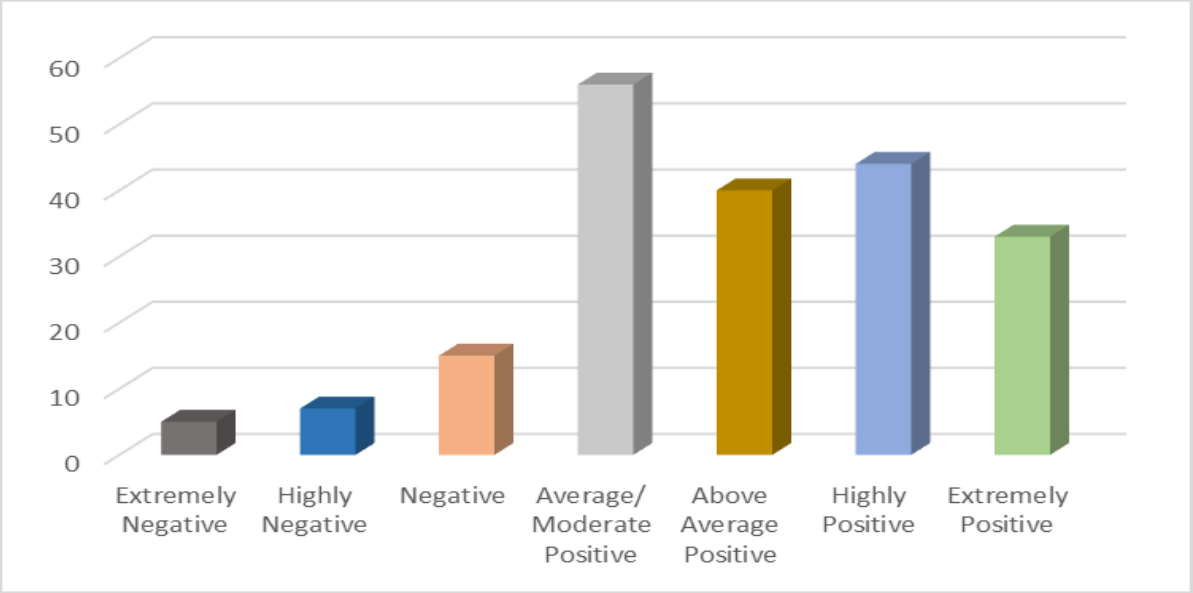
4.1. INTRODUCTION

The most important part of a research is analysis and interpretation of the collected data. This helps to get a clear picture of the raw information collected. Analysis of data is studying and tabulating the existing complex factors into simpler parts and putting the parts together in new arrangement for the purpose of interpretation. The systematic analysis and interpretation of the data in this chapter will provide information about the attitude of secondary school teachers towards mobile learning in relation to certain demographic variables.

4.2. HYPOTHESIS WISE INTERPRETATION OF DATA

To determine the level of attitude of secondary school teachers towards mobile learning

The analysis and interpretation of this objective has been done by calculating the frequency, distribution of scores and percentages in attitude of secondary school teachers towards mobile learning in relation to certain demographic variables. It is presented in table 4.a and graph A



Graph A: Graphical representation showing overall level of Attitude of Secondary School Teachers towards Mobile Learning

Level of Mobile Learning	Range	F	%
Extremely Negative	-2.01 & below	5	2.5
Highly Negative	-2.00 to -1.26	7	3.5
Negative	-1.25 to -0.51	15	7.5
Average/ Moderate Positive	-0.50 to +0.50	56	28
Above Average Positive	+0.51 to +1.25	40	20
Highly Positive	+1.26 to +2.00	44	22
Extremely Positive	+2.01 & above	33	16.5
Total (N)		**200**	

Table 4.a: Frequency scores and percentages of Attitude of Secondary School Teachers Towards Mobile Learning

As presented in the **Table 4.a and Graph A** it shows the Levels of Attitude of Secondary School Teachers towards Mobile Learning (N=200). Very low score i.e. 2.5% (5), 3.5% (7) and 7.5% (15) scores fall under -2.01 & below, -2.00 to -1.26 and -1.25 to -0.51 range of scores respectively, which is rated as "Extremely Negative", "Highly Negative" and "Negative" level of mobile learning. Also 20%, 22% and 16.5% scores fall under the range "Above Average Positive", "Highly Positive" and "Extremely Positive", respectively. The maximum number of scores i.e. 28% (56) fall under the range "Average/ Moderate Positive". Therefore, we see that the respondents or the teachers have rated their skills and abilities as having average/ moderate positive level of attitude towards mobile learning.

In order to find the difference in the level of attitude of secondary school teachers towards mobile learning, a null hypothesis is formulated as follows-

HYPOTHESIS 1: There is no significant difference in the level of attitude of secondary school teachers towards mobile learning

To test the null hypothesis for finding out the level of significant difference, the data has been analysed, interpreted using chi-square. The table value of χ (chi)= 8.22 which was checked at 0.05 level of significance with df=6 for testing the null hypothesis. It is shown in the table below:

Level	1	2	3	4	5	6	7	Total	χ^2
Frequency	5	7	15	56	40	44	33	200	8.22

Table 4.b: Level of attitude of mobile learning, frequency and χ value of mobile learning scores of secondary school teachers

From Table 4.b the result shows that the computed χ^2 value is 8.22 which is less than the table value of χ at 0.05 level of significance for 6 df which is 12.59. Hence, the null hypothesis "There is no significant difference in the level of attitude of secondary school teachers towards mobile learning" is accepted.

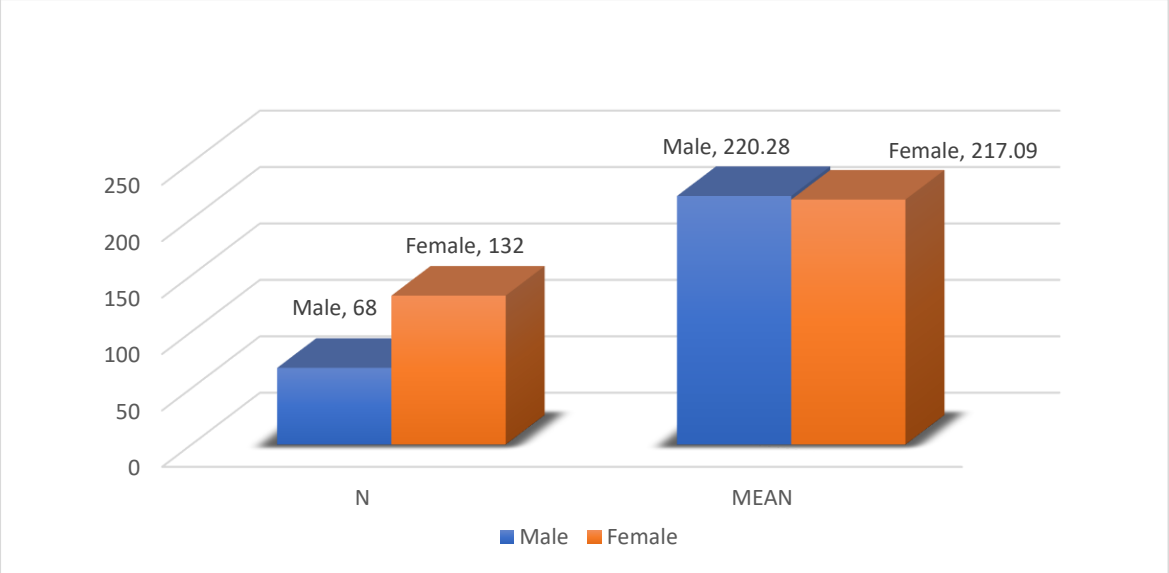
To study the attitude of secondary schools towards mobile learning with respect to gender, types of school, qualification and work experience.

HYPOTHESIS 2: There is no significant difference in the attitude of male and female secondary school teachers towards mobile learning

Sl. No.	GENDER	N	MEAN	S.D.	t	df	S/NS
1	Male	68	220.28	26.069	0.786	198	NS
2	Female	132	217.09	27.716			

***At 0.05 level of significance**

Table 4.c: Mean score, SD and t value of attitude differential between male and female secondary school teachers



Graph B: mobile learning attitude differential between male and female secondary school teachers

According to the information given in the table 4.c, the calculated t value i.e. 0.786, is less than table value for 198 df at 0.05 level of significance. Therefore, there is no significant difference between the mean scores of attitudes of male and female secondary school teachers towards mobile learning.

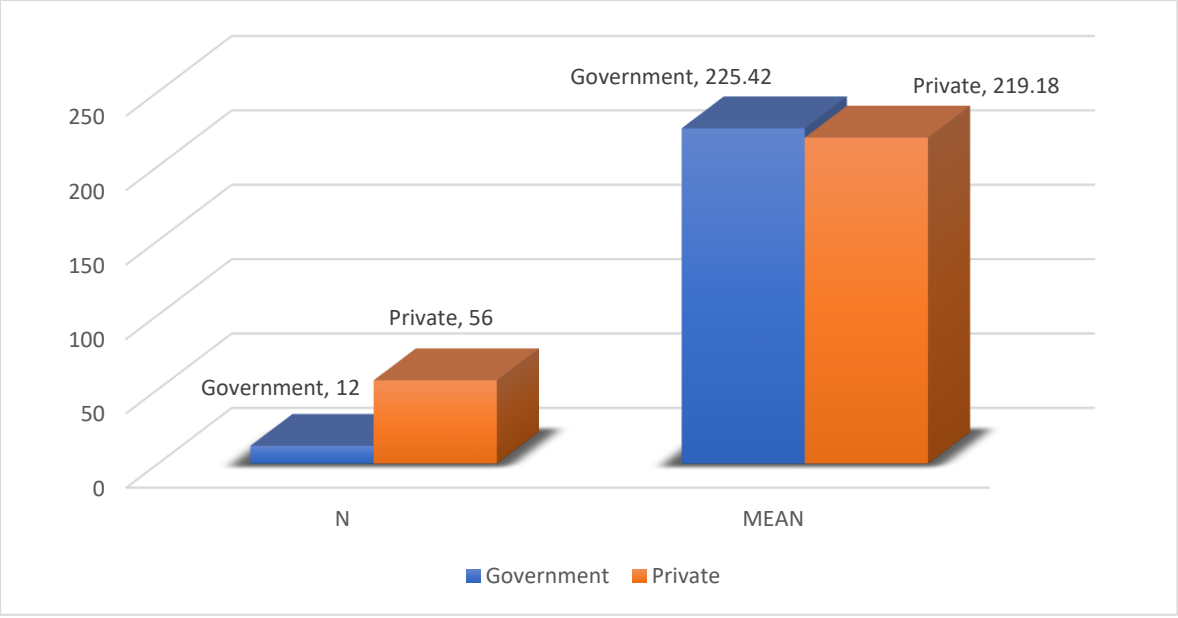
Hence, the null hypothesis, that "There is no significant difference in the attitude of male and female secondary school teachers towards mobile learning" is accepted.

HYPOTHESIS 3: There is no significant difference in the attitude of government and private secondary school male teachers towards mobile learning

Sl. No.	MALE	N	MEAN	S.D.	t	df	S/NS
1	Government	12	225.42	25.889	.750	66	NS
2	Private	56	219.18	26.208			

***At 0.05 level of significance**

Table 4.d: Mean score, SD and t value of attitude differential between government and private secondary school male teachers



Graph C: Mobile learning attitude differential between government and private secondary school male teachers

According to the information given in the table 4.d, the calculated t value i.e. 0.750, is less than table value i.e. 2.0 for 66 df at 0.05 level of significance. Therefore, there is no significant difference between the mean scores of attitudes of government and private secondary school male teachers towards mobile learning.

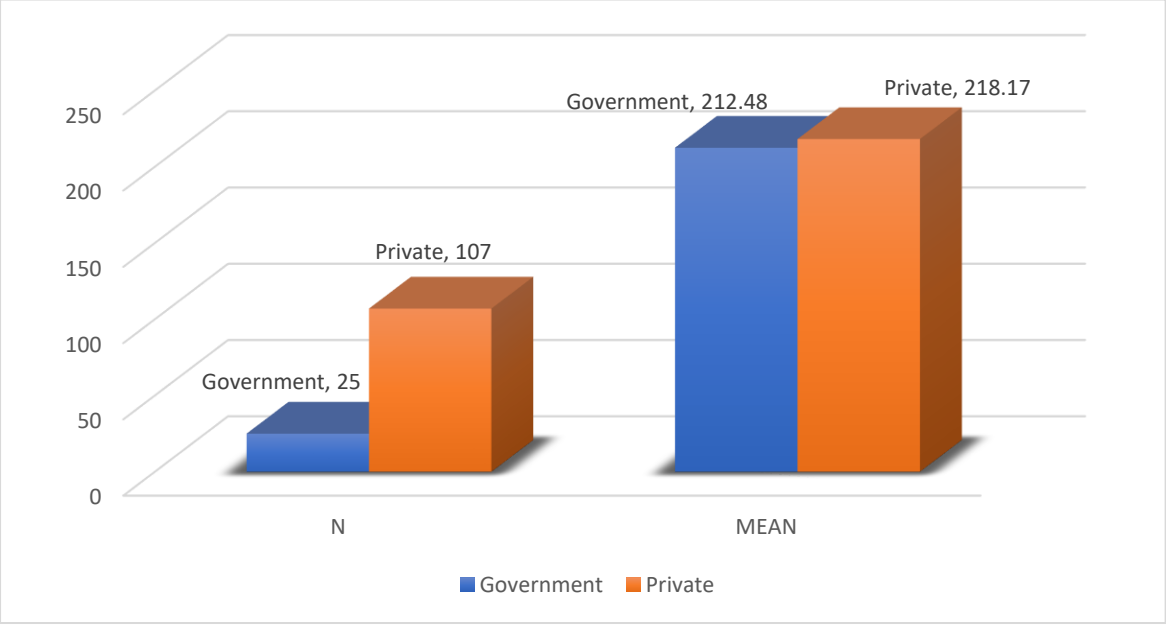
Hence, the null hypothesis, that "There is no significant difference in the attitude of government and private secondary school male teachers towards mobile learning" is accepted.

HYPOTHESIS 4: There is no significant difference in the attitude of government and private secondary school female teachers towards mobile learning

Sl. No.	FEMALE	N	MEAN	S.D.	t	df	S/NS
1	Government	25	212.48	34.349	.923	130	NS
2	Private	107	218.17	26.000			

***At 0.05 level of significance**

Table 4.e: Mean score, SD and t value of Mobile learning attitude differential between government and private secondary school female teachers



Graph D: Mobile learning attitude differential between government and private secondary school female teachers

According to the information given in the table 4.e, the calculated t value i.e. .923, is less than table value i.e. 1.98 for 130 df at 0.05 level of significance. Therefore, there is no significant difference between the mean scores of attitudes of government and private secondary school female teachers towards mobile learning.

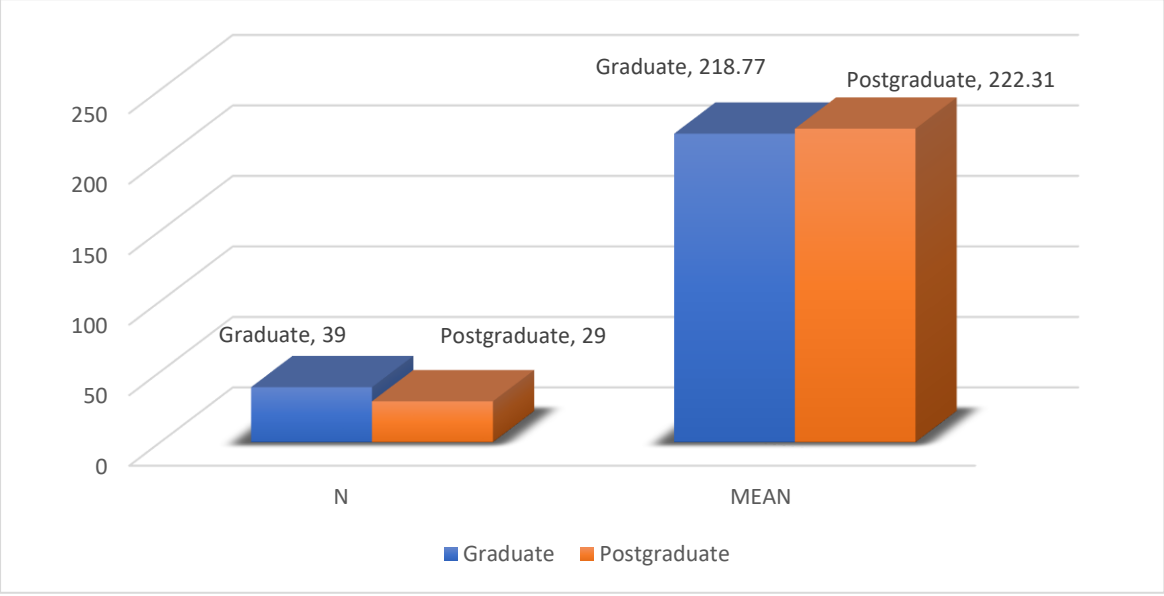
Hence, the null hypothesis, that "There is no significant difference in the attitude of government and private secondary school female teachers towards mobile learning" is accepted.

HYPOTHESIS 5: There is no significant difference in the attitude of graduate and postgraduate secondary school male teachers towards mobile learning

Sl. No	MALE	N	MEAN	S.D.	t	df	S/NS
1	Graduate	39	218.77	26.013	.551	66	NS
2	Postgraduate	29	222.31	26.466			

***At 0.05 level of significance**

Table 4.f: Mean score, SD and t value for Mobile learning attitude differential between graduate and postgraduate secondary school male teachers



Graph E: Mobile learning attitude differential between graduate and postgraduate secondary school male teachers

According to the information given in the table 4.f, the calculated t value i.e. .551, is less than table value i.e. 2.00 for 66 df at 0.05 level of significance. Therefore, there is no significant difference between the mean scores of attitudes of graduate and postgraduate secondary school male teachers towards mobile learning.

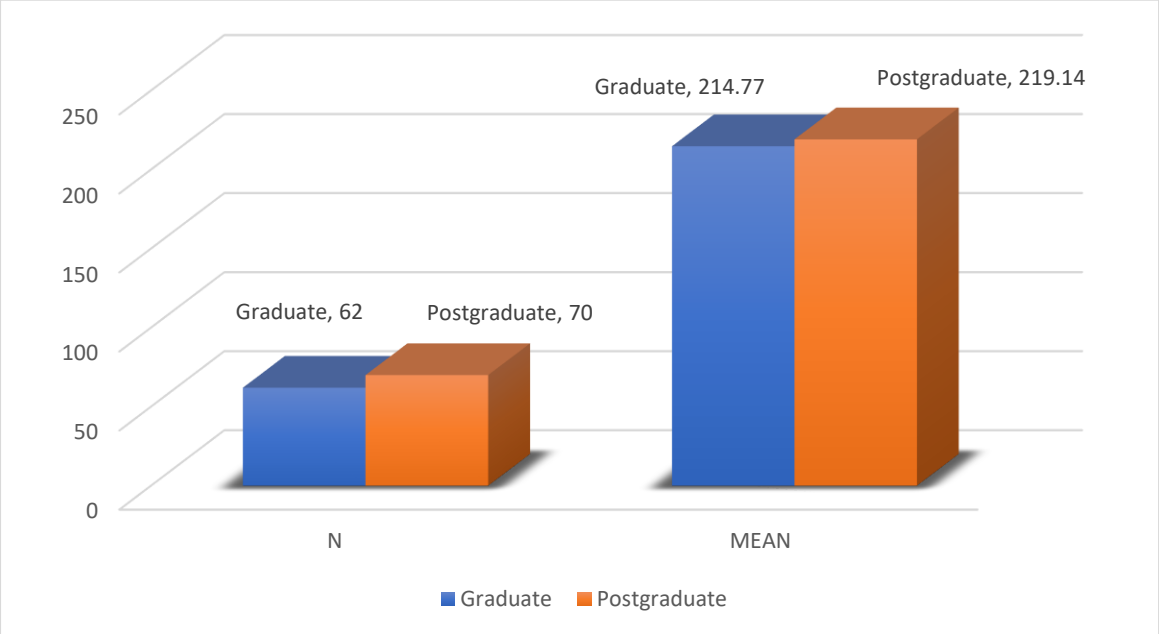
Hence, the null hypothesis, that "There is no significant difference in the attitude of graduate and postgraduate secondary school male teachers towards mobile" is accepted.

HYPOTHESIS 6: There is no significant difference in the attitude of graduate and postgraduate secondary school female teachers towards mobile learning

Sl. No	FEMALE	N	MEAN	S.D.	t	df	S/NS
1	Graduate	62	214.77	29.545	.903	130	NS
2	Postgraduate	70	219.14	26.030			

***At 0.05 level of significance**

Table 4.g: Mean score, SD and t value for Mobile learning attitude differential between graduate and postgraduate secondary school female teachers



Graph F: Mobile learning attitude differential between graduate and postgraduate secondary school female teachers

As per the information given in the table 4.g, the calculated t value i.e. .903, is less than table value i.e. 1.98 for 130 df at 0.05 level of significance. Therefore, there is no significant difference between the mean scores of attitudes of graduate and postgraduate secondary school female teachers towards mobile learning.

Hence, the null hypothesis, that "There is no significant difference in the attitude of graduate and postgraduate secondary school female teachers towards mobile learning" is accepted.

HYPOTHESIS 7: There is no significant difference in the attitude of secondary school teachers towards mobile learning with respect to their work experience

Table 4.h: SUMMARY OF ANOVA

Sl. No	**Source of Variance**	**Sum of Squares (SS)**	**df**	**Mean Sum of Squares (MS)**	**F**	**S/NS**
1	Between Groups	541.871	2	270.935	.365	NS
2	Within Groups	146077.004	197	741.508		
Total		146618.875	199			

***At 0.05 level of significance**

As per the information given in the table 4.h, the calculated F value .365 is less than 2 df at 0.05 level of significance. Therefore, there is no significant difference in the attitude of secondary school teachers towards mobile learning with respect to their work experience.

Hence, the null hypothesis, that "There is no significant difference in the attitude of secondary school teachers towards mobile learning with respect to their work experience" is accepted.

4.10. CONCLUSION AND OVERVIEW OF FORTHCOMING CHAPTER

The data has been analyzed and presented in the form of graphs and tables. The inferences and conclusion are interpreted and explained in detail from the findings of the study. In the forthcoming chapter, summary, major findings, educational implications, suggestions and conclusion of the whole research will be discussed in detail.

CHAPTER V

MAJOR FINDINGS, EDUCATIONAL IMPLICATIONS, SUGGESTIONS AND CONCLUSION

CHAPTER V
MAJOR FINDINGS, EDUCATIONAL IMPLICATIONS, SUGGESTIONS FOR FURTHER RESEARCH AND CONCLUSION

5.1. INTRODUCTION

This section of the chapter highlights the major findings of the study carried out by the investigator. Considering the responses of the respondents to the rating scale, the following results were established from the objectives of the study respectively:

5.1.1 Summary

Education plays a major role in socialization process and paves the way for enhanced awareness and originality to look for solution. It leads to a lifelong process of learning, development and exploration where these dimensions are drawn from the self and the society. Teaching as a complex activity needs systematization for useful delivery if information with the help of technology. The integration of Information and Communication Technology (ICT) and use of different educational technologies (mobile learning) in education has led to a new era influencing every sector of the society and is not only affecting teaching and teachers but also influence the teachers to be competent and techno smart to cope with any kind of class room situation and they themselves first become the explorer of knowledge and information.

Realising the importance of educational technologies, NCERT has come up with a school curriculum framework where it has emphasized on the integration of educational technologies in all areas of education. NCTE has also emphasized on the importance of educational technologies in teacher education. It is because educational technologies have massive potential for Education. Educational technologies allow a teacher to teach effectively and efficiently.

5.1.2 Justification of the study

After examining various researches that have been carried out the researcher has formulated the following justifications:

i. The attitude of teachers toward mobile learning with respect to their gender and work experience was positive and found favorable but the problems of incorporating Mobile learning in mainstream education and training were noticed. In spite of these hindrances, the teacher community is willing to accept mobile learning.
ii. Also, it was found that mobile learning is considered as an important tool in the present educational system. In the present scenario, instruction is no longer confined to the four walls of classroom and can take place anytime and anywhere.
iii. It was found that only few studies have been conducted particularly in Nagaland in relation to electronic learning and no research was carried out on mobile learning.
iv. Through this study, the attitude of secondary school teachers towards mobile learning with respect to gender, types of school, qualifications and work experiences can be brought to light.

5.1.3 Statement of the problem

As use of educational technologies, electronic learning and mobile learning is the need of the hour and with the ever-increasing demand of the community, learners, parents and teachers in the teaching learning process the study intends to find the attitude of secondary school teachers towards mobile learning with respect to their gender, types of school, qualifications and their work experiences.

To precisely propose the problem, the present study is titled **"Attitude of Secondary school teachers towards mobile learning in relation to certain demographic variables".**

5.1.4 Variables of the study

Dependent Variables: Attitude towards mobile learning

Independent variables: Gender, Qualifications, types of school and work experiences

5.1.5 Definition of key terms

i. **Attitude:** It is the positive or negative degree of effect associated with a certain subject. In the present study attitude refers to the inclination of teacher's approach towards mobile learning.
ii. **Secondary school teachers:** In the present study, the teacher refers to individuals teaching in government and private secondary schools.

iii. **Mobile learning:** It is the delivery of learning content or learning support with mobile phones, PDAs or tablets.

iv. **Demographic variables:**

a. Gender: Male and female

b. Types of School: Government and private secondary schools

c. Qualifications: Graduate and post graduate

d. Work experiences: In the present study less than 2 years of teaching experience are grouped in less experienced teacher, 3-4 years as experienced teacher and 5 years and above as highly experienced teacher.

5.1.6 Objectives of the study

The following are the objectives of the present study:

i. To determine the level of attitude of secondary school teachers towards mobile learning

ii. To study the attitude of secondary school teachers towards mobile learning with respect to gender

iii. To study the attitude of secondary school teachers towards mobile learning with respect to types of school

iv. To study the attitude of secondary school teachers towards mobile learning with respect to qualifications

v. To study the attitude of secondary school teachers towards mobile learning with respect to work experiences

5.1.7 Hypothesis of the study

ii. There is no significant difference in the level of attitude of secondary school teachers towards mobile learning

vii. There is no significant difference in the attitude of male and female secondary school teachers towards mobile learning.

viii. There is no significant difference in the attitude of government and private secondary school male teachers towards mobile learning.

ix. There is no significant difference in the attitude of government and private secondary school female teachers towards mobile learning.

x. There is no significant difference in the attitude of graduate and post graduate secondary school male teachers towards mobile learning.

xi. There is no significant difference in the attitude of graduate and post graduate secondary school female teachers towards mobile learning.

xii. There is no significant difference in the attitude of secondary school teachers towards mobile learning with respect to their work experience.

5.1.8 Delimitation of the study

i. The study was delimited to secondary school teachers only.

ii. The study was delimited to Dimapur district of Nagaland only.

iii. The study was delimited to attitude of teachers towards mobile learning only.

5.1.9 Methods of the study

Descriptive survey method was used to carry out the proposed study. This method rightly suits the character of the study carried out and it will be helpful in creating genuine descriptions of the existing situation and attitude of secondary school teachers towards Mobile learning

5.1.10 Tool used

The researcher used Teacher Mobile Learning Attitude Scale (TMLAS) prepared by P. Pachaiyappan and S. Rajkumar (2015) which is a standardized tool for collection of data in the present study.

5.1.11 Population and sample

All teachers working in secondary schools of Nagaland is the population of the present study and Dimapur district of Nagaland as its sample. Random sampling technique was employed for selecting the sample.

There are 181 secondary schools (151 Private and 30 government school) as per the record of Dimapur district portal. Proportionately 20% of schools randomly i.e. 30 private schools and 6 govt. schools. and from these school's 200 teachers were selected as sample for the present study.

5.1.12 Collection of data

Data were collected in two forms, in person visited the schools and through google form. After taking proper permission from the Principal, Head teacher, Head master and Teacher in charge of the targeted schools, the researcher went to the staff room/ teachers' common room

to meet the teachers individually and introduce them with the topic and purpose of the research being carried out in detail while knowing their perspectives during the conversation. The attitude scale was handed out to the teachers and enough time was given for reflecting on their responses. Some responses were collected through google form because of covid pandemic situation during the time of carrying out research. The test was administered strictly and complete confidentiality was maintained during and after the process of data collection

5.1.13 Statistical technique

Appropriate statistical techniques were used to draw out inferences from the raw data collected for this study. The following techniques were used in the present study for the analysis and interpretation of data collected:

i. In the first phase, the simple descriptive statistical techniques like computation of mean, standard deviation, were used to ascertain the normality of the distribution of various scores of the concerned variables.
ii. In the second phase T-test was applied to test the significance of difference in the mean scores of variables.
iii. In the fourth stage, Chi-Square was used to significant difference in the level of Attitude of Secondary School Teachers Towards Mobile Learning.
iv. In the fifth phase, ANOVA test was applied to test the significant difference in the mean scores of more than two samples.
v. The results were presented graphically in the form of bar diagrams.

5.2. MAJOR FINDINGS

Objective 1: To determine the level of attitude of secondary school teachers towards mobile learning

The levels of Attitude are Extremely Negative, Highly Negative, Negative, Average/ Moderate Positive, Above Average Positive, Highly Positive and Extremely Positive according to the manual prepared by P. Pachaiyappan and S. Rajkumar (2015)

It was found that the secondary school teachers have positive attitude towards mobile learning. Having only 2.5%, 3.5% and 7.5% respectively inclining towards negative attitude. average/ moderate positive attitude towards mobile learning is observed in the study with 28%.

It can be concluded that majority of the secondary school teachers in Dimapur district have average /moderate level of attitude (28%) towards mobile learning. Similar studies conducted across the globe carried out by Vandana and Rajnewa 2009, Sridevi 2010, KrishnaKumar and Rajesh 2011, Khan 2016, Emran, et., al 2016 and Akaram and Pachaiyappan 2017 also contributed to the findings that the teachers have positive and favorable attitude towards mobile learning.

Objective 2: To study the attitude of secondary school teachers towards mobile learning with respect to gender, types of school, qualifications and work experiences

Gender: It was found out that the mean scores of male school teachers are 220.28 with a standard deviation (SD) of 26.069 and the mean scores of female teachers are 217.09 with a standard deviation of 27.716. This indicates the difference of mean score of 3.19 which is in favour of male teachers but since the t value is less than table value, there is no significant difference in the attitude of male and female secondary school teachers towards mobile learning.

This may be because of the realization for the need and effectiveness of educational technologies and specifically mobile learning in the normal teaching learning process. Shashaani 1997 and Youngkyun Baek 2017 also carried out similar study related to computer attitude and mobile learning respectively which had a contradicting result stating that female teachers are less interested and possess low self confidence and the females in Korea have more positive attitude towards mobile learning than the male teachers.

Types of School: It was found out that the mean scores of government school is 225.42 with a standard deviation (SD) of 25.889 and the mean scores of private schools is 219.18 with a standard deviation of 26.208. This indicates the difference of mean score of is 6.24. The schools are categorized as government and private schools in the study. It was found that there is slightly higher positive attitude shown in private schools but there is no significant difference in the attitude of government and private secondary school teachers towards mobile learning.

This may be due to better awareness and better infrastructure provided in private schools compared to the government schools. Vandana and Rajnewa 2009 and Akaram and Pachaiyappan 2017 also found that the teachers of Government and private institutions have equal favorable and positive attitude towards mobile learning.

Qualifications: The qualifications of the teachers are categorized in two groups i.e. graduate and postgraduate. The mean score of graduate teachers is 218.77 with standard deviation (SD) 26.013 and mean scores of postgraduate teachers is 222.31 with standard deviation (SD) 26.466 with 3.54 as the difference in mean score but since the t value is less than table value it can be concluded that there is no significant difference in the attitude of graduate and post graduate secondary school teachers towards mobile learning was observed in the study.

This, may be due to the realization of the importance and effectiveness of use of mobile in teaching and learning process.

Work Experiences: The work experience is categorized in three groups i.e. service as teacher for less than 2 years, 3-4 years and 5 years above for the study.

It was observed that teachers with less than 2 years and 3-4 years have more positive attitude towards mobile learning but there is no notable difference in the attitude of secondary school teachers towards mobile learning with respect to their work experiences this may be due to the skill and knowledge possessed by young and fresh graduate and postgraduate teachers.

5.3. EDUCATIONAL IMPLICATIONS

Following are the main implications of this study:

i. The present study indicates that teachers with better awareness and skills of using technology will make more effective classroom delivery. Therefore, necessary arrangements and infrastructures should be made available for both teachers and students in the schools at all levels introducing trainings and courses related to use and professionalizing educational technologies.
ii. Teacher trainings should be held in order to stay updated and connected to new trends emerging continuously in the field of education.
iii. Teachers should encourage students to expand their technical awareness since the age we are living in has posed great importance to technological innovations and use.
iv. Mobile learning can help learners become more self-reliant and independent learners.
v. Teachers are more creative dealing with some problems with the use of their mobile devices.

5.4. SUGGESTIONS FOR FURTHER RESEARCH

Based on the findings, the following are suggested for further exploration of research activities in the area of study:

i. In the present study, only one aspect i.e. attitude was considered. For further research, other aspects may be included for investigation.
ii. This study is delimited to only secondary school teachers. Extended study may be conducted in college and university level. The universities have greater potentials for large scale application of mobile learning.
iii. A more comprehensive and effective study may be conducted having various states or districts.
iv. A study may be planned to find out the effectiveness of mobile learning and use of educational technologies-based programmes.

5.5. CONCLUSION

The ever-increasing dependency on mobile devices even in the field of education are catalysts for the adoption of mobile Learning in the field of education. However, with its wide-spread and acceptance of mobile devices to perform various tasks and the flexible policies that have led to its universal acceptance. Mobile Learning lends to the flexibility of learning; it gives learners the choice to learn on a mobile device, while being 'mobile', read 'on-the-go' too, rather than being stuck to a desktop or a laptop. This approach makes learning self-driven, which is in turn said to improve knowledge retention and enhance performance at the same time. The present study provides some valuable inputs to the educational system. This study has significant educational implications in context of secondary school teachers' attitude towards mobile learning and some of its key elements.

Learning with mobile or mobile learning and its attitude among the secondary school teachers of Dimapur district is concluded to be Average/Moderate Positive. There is no significant difference in the attitude of secondary school teachers towards mobile learning with respect to their gender (male and female), types of school (government and private), qualifications (graduate and postgraduate) and work experience (less than 2 years, 3-4 years and 5 years). With techno friendly education the teachers need to be enhanced and equipped with basic use of ICT, educational technologies, computer knowledge and use of Internet. Attitudinal change has to be affected among the secondary school teachers, as the attitude towards mobile learning contributes the most towards the diverse learning styles.

BIBLIOGRAPHY

BIBLIOGRAPHY

Akaram & Pachaiyappan, P. (2017). Attitude towards Mobile- Learning among Prospective Teachers. *International Education and Research Journal (IERJ*). Vol 3, issue 3, *ISSN 2454-9916.* Retrieved from **https://ierj.ac.in**

Amrit Pal Kaur., (2014). Pre-Service Science Teachers' Attitudes towards the use of selected ICT tools in Teaching: An Exploratory Study, Advancing Education

Barak, Miri., (2014). Closing the Gap between Attitudes and Perceptions about ICY Enhanced Learning among Pre-Service STEM Teachers, *Journal of Science Education and Technology,* 23(1),1-14.

Behera, S. K. (2013). E and M- Learning: A Comparative Study. *International Journal on new trends on Education and their Implications*. *Vol4, Issue3, ISSN1309- 6249*. Retrieved from https://ijonte.org

Bindu C.N., (2017). Attitude towards, and awareness of using ICT in classrooms: A case of expatriate Indian teachers in UAE, Paper presented at the *Journal of Education and Practice, India,* 8(1), 10-17.

Chaube, S.P, & Akhileshchaube., (1999). Educational psychology, Agra, *Lakshmi Narain Agarwal Educational publishers,* Fourth edition.

Chauhan, S.S., (1999). Advanced Educational Psychology, New Delhi, *Vikas Publishing House Pvt. Ltd,* sixth revised edition.

Dey, B. Saxena, K.M. & Gihar, S. (2006). ICT and Teacher Educator's. *Indian Educational Abstracts*. 6(1): 15-19.

Dixit, M. & Kaur, M. (2015). Attitude of Teachers Trainees towards ICT Teaching, *International Journal of Pure and Applied Researches. 1(1):169-174*

Emran, M, et.al. (2016). Attitude towards the use of Mobile- Learning in Higher Education. Retrieved from https://www.researchgate.net

Ismail, I, et.al. (2013). Mobile phone Acceptance and Readiness among the Teachers. *The Journal of Educators Online. Vol3, Issue 1, ISSN 1547- 500x*

Khan, A. (2016). Investigation of Teachers Attitude in E-Learning- A case study in Punjab University Chandigarh. *Gian Jyoti E Journal*. *Vol6, issue 3, ISSN 2250-348*. Retrieved from https://www.gjiimt.ac.in

Kothari, C. R. (2009). Research Methodology-Methods & Techniques. New Delhi: *New Age International Publishers.*

Kulkarni, S.S. (1996). In S.P. Ruhela (1999). Essentials of Educational Technology. New Delhi: *Indian Publishers Distributors.*

Kumar, K. & Patil, S. (2013). A Study on Teacher's Attitude towards Using New Technologies. *Indian Journal of Applied Research.* 3(2).90-91.

Kumar, R. (2011). Research Methodology. *New Delhi: SAGE PublicationIndia PVT.Ltd.*

Krishnakumar, R., Rajesh K M. (2011) Attitude of Teachers of Higher Education towards e-Learning. *Journal of Education and Practice. 2(4)*. Retrieved from www.iiste.org

Krishnaswami, O. R., & Ranganatham, M. (2016). Methodology of Research In Social Sciences. Mumbai: *Himalaya Publishing House PVT.LTD.*

Lai, H. J. (2011). The Influence of Adult Learners' Self-Directed Learning Readiness & Network Literacy on Online Learning Effectiveness: A Study of Civil Servants in Taiwan. *Educational Technology & Society, 14* (2), 98-106.

Lubna J. Mansuri., (2017). Attitude towards Information Technology: A study of secondary school teachers. Paper presented at the *Journal of Scholarly Research Journal for Interdisciplinary studies*,4(35), July – August, 6486 -6493.

Mcmillan, J. H. (1996). Educational Research Fundamentals for the consumer. *New York: Harper Collins Publisher Inc.*

Mahajan, G. (2016). Attitude toward the use of Educational Technology in Teaching. Educational Quest*: An International Journal of Education and Applied Scocial Sciences*. Retrieved from https://indpublisher.in

Mashau, N.L. (2016). Issues Affecting the Adoption and Usage of Mobile Instant Messaging in Semi-Rural Public Schools of South Africa for Learning. *Open Access Library Journal, Vol.03 No.11*.

Nachimathu.K, & Vijayakumari. G (2007). "Modern ICT Trends in Teaching Technology", *Edutracks*, February, Vol.6, (6).

Naser Jamil Al-Zaidiyeen et al., (2010). Teachers' Attitudes and Levels of Technology Use in Classrooms: The Case of Jordan Schools, *International Education Studies* 3(2), 211-218

Ozdamli, F., & Cavus, N. (2011). Basic elements of mobile learning- Social and Behavioural Sciences. Edutracks. Vol28, Issue5, Pages937-942.

Pandya, S. R. (2010). Educational Research. *Delhi: Balaji Offset.*

Rengarajan, P., & Senthilnathan. (2012). Teacher Educators Attitude towards E- Learning. *Edutracks* Vol2, Issue1, Pages 21-32.

Placidius Ndibalema., (2014). Teachers' Attitudes towards the Use of Information Communication Technology (ICT) as a Pedagogical Tool in Secondary Schools in Tanzania: The Case of Kondoa District, *International Journal of Education and Research*,2(2), 1-16.

Sharma, S. P. (2013). Techniques of Educational Research, Data Collection and Analysis. NewDelhi: *Madan Sachdeva for Kanishka Publishers.*

Sridevi, K.V. (2010). Attitude of Secondary School Teachers Towards e-Learning. Bharathidasan University of Tiruchirappalli.

Vandana Mehra & Dilli Rajnewa. (2009). "School Teachers Attitude towards Information and Communication Technology", *Edutracks*, (25-29).

Vasiliki Vrana (2005), "Analysing Academic Staff and Students' Attitudes Towards the Adoption of e-Learning", Technological Education Institute of Serres, Greece.

Wanjala Martin.M.S., Elizabeth N.Khaemba & Mukwa Chris. (2011). "Significant Factors in Professional Staff Development for the Implementation of ICT Education in Secondary Schools: A case of schools in Bungoma District, Kenya", International journal of Curriculum and Instruction Vol. April, 1(1), 30-42.

Youngkyun Baek, (2017). Teachers' Attitudes toward Mobile Learning in Korea, *The Turkish Online Journal of Educational Technology – January 2017, vol. 16(1). Pp.154-163.*

(2020). *Report on UDISE+ 2019-2020.* Government of India, Ministry of Health and Family Welfare, GOI .

http://hdl.handle.net/10603/346931

http://hdl.handle.net/10603/262085

APPENDICES

APPENDIX-I: PLAGIARISM REPORT

Document Information

Analyzed document	SILE HAIKAM-MPHIL DISSERTATION-02-2020-MOBILE LEARNING.doc (D119903065)
Submitted	2021-11-25T18:05:00.0000000
Submitted by	MURATHOTI RAJENDRA NATH BABU
Submitter email	mrajendranathbabu@nagalanduniversity.ac.in
Similarity	6%
Analysis address	mrajendranathbabu.naga@analysis.urkund.com

Sources included in the report

W	URL: https://pdfs.semanticscholar.org/6b66/fbe46f5ea71376b60ba8c8c1c89d28d7dd9c.pdf Fetched: 2021-11-25T18:07:00.0000000	1
W	URL: https://ijcrt.org/papers/IJCRT2105515.pdf Fetched: 2021-11-09T02:11:32.5200000	10
W	URL: https://zenodo.org/record/845457/files/72.pdf Fetched: 2019-11-25T09:12:08.3770000	10
W	URL: https://files.eric.ed.gov/fulltext/EJ1124925.pdf Fetched: 2021-11-25T18:07:00.0000000	5
W	URL: https://www.researchgate.net/publication/280601741_Attitudes_Towards_the_Use_of_Mobile_Learning_A_Case_Study_from_the_Gulf_Region Fetched: 2021-11-25T18:07:00.0000000	1
W	URL: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7658300/ Fetched: 2021-11-25T18:07:00.0000000	2
W	URL: https://www.scirp.org/journal/paperinformation.aspx?paperid=110868 Fetched: 2021-11-25T18:07:00.0000000	1
W	URL: https://files.eric.ed.gov/fulltext/EJ1165892.pdf Fetched: 2021-11-25T18:07:00.0000000	1
W	URL: https://jurnal.iicet.org/index.php/essr/article/download/554/516 Fetched: 2021-11-25T18:07:00.0000000	1

APPENDIX-II: SAMPLE PERMISSION LETTER

NAGALAND UNIVERSITY

DEPARTMENT OF TEACHER EDUCATION, KOHIMA CAMPUS, MERIEMA

Date:

To

The Principal

……

SUB: NU- DTE- M. Phil. Dissertation- Data Collection Permission

Respected Sir/Madam

My name is Sile Haikam and I am currently pursuing my M. Phil. From Nagaland University, Kohima Campus. I would like to inform you that I am doing my dissertation on the topic entitled **"Attitude of Secondary School Teachers Towards Mobile Learning in Relation to Certain Demographic Variables"** under the guidance of Dr. Pradipta Kumar Pattnaik, Department of Teacher Education, Nagaland University.

As mentioned above, I would like to seek your permission to collect data among your teachers. I assure you that the data collected will remain confidential and will be used for academic purposes only.

Your kind approval will be of great help for the success of this research study. Thanking you.

Yours faithfully,

Name: Sile Haikam

Roll. No. 02/2020

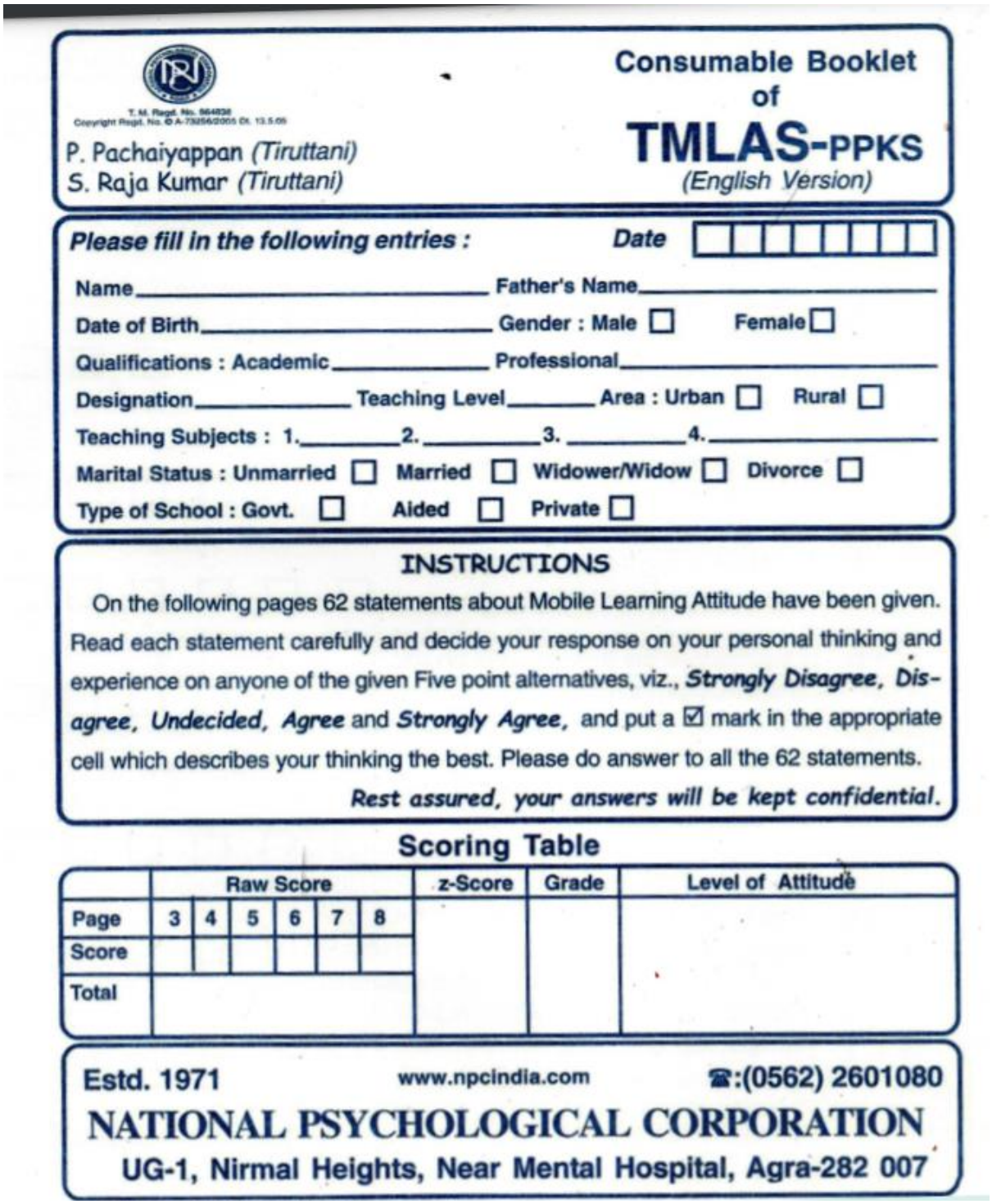
M. Phil. Research Scholar

Department of Teacher Education

APPENDIX-III: PERSONAL DATA SHEET

Sl. No.	Questions	Statement
1	Gender	Male Female
2	Type of School	Government Private
3	Qualification	Graduate Postgraduate
4	Work Experience	Less than 2 years 3-4 years Above 5 years

APPENDIX-IV: TEACHER MOBILE LEARNING ATTITUDE SCALE



T. M. Regd. No. 564838
Copyright Regd. No. © A-73256/2005 Dt. 13.5.05

P. Pachaiyappan *(Tiruttani)*
S. Raja Kumar *(Tiruttani)*

Consumable Booklet of

TMLAS-PPKS

(English Version)

Please fill in the following entries : **Date** ☐☐☐☐☐☐☐☐

Name_____ **Father's Name**_____

Date of Birth_____ **Gender : Male** ☐ **Female** ☐

Qualifications : Academic_____ **Professional**_____

Designation_____ **Teaching Level**_____ **Area : Urban** ☐ **Rural** ☐

Teaching Subjects : 1._____ **2.**_____ **3.**_____ **4.**_____

Marital Status : Unmarried ☐ **Married** ☐ **Widower/Widow** ☐ **Divorce** ☐

Type of School : Govt. ☐ **Aided** ☐ **Private** ☐

INSTRUCTIONS

On the following pages 62 statements about Mobile Learning Attitude have been given. Read each statement carefully and decide your response on your personal thinking and experience on anyone of the given Five point alternatives, viz., ***Strongly Disagree, Disagree, Undecided, Agree*** and ***Strongly Agree,*** and put a ☑ mark in the appropriate cell which describes your thinking the best. Please do answer to all the 62 statements.

Rest assured, your answers will be kept confidential.

Scoring Table

	Raw Score						z-Score	Grade	Level of Attitude
Page	3	4	5	6	7	8			
Score									
Total									

Estd. 1971 **www.npcindia.com** **☎:(0562) 2601080**

NATIONAL PSYCHOLOGICAL CORPORATION

UG-1, Nirmal Heights, Near Mental Hospital, Agra-282 007

Sr. No.	STATEMENTS	Strongly Disagree	Dis-agree	Un-decided	Agree	Strongly Agree	SCORE
1.	Mobile learning is a boon for the 21st Century teaching-learning.	☐	☐	☐	☐	☐	⬭
2.	Mobile learning increases the flexibility of my learning.	☐	☐	☐	☐	☐	⬭
3.	I feel mobile technologies can promote and foster my communication and collaborative skills.	☐	☐	☐	☐	☐	⬭
4.	Mobile devices allow differentiated instruction for diverse learners who can learn at their own pace.	☐	☐	☐	☐	☐	⬭
5.	Mobile learning helps me to raise self-esteem/self-confidence.	☐	☐	☐	☐	☐	⬭
6.	I can access the internet through my smart mobile phone.	☐	☐	☐	☐	☐	⬭
7.	I use mobile phone to connect social media, respond to a question posed by the techer, post a comment, blog, or use the device as a calculator.	☐	☐	☐	☐	☐	⬭
8.	Mobile learning helps me to improve literacy and numerical skills.	☐	☐	☐	☐	☐	⬭
9.	Mobile learning encourage me both independent and collaborative learning experiences.	☐	☐	☐	☐	☐	⬭

Total Score Page 3 ☐

Sr. No.	STATEMENTS	Strongly Disagree	Dis-agree	Un-decided	Agree	Strongly Agree	SCORE
10.	My interaction with other persons would be difficult without mobile learning.	☐	☐	☐	☐	☐	⬭
11.	I clarify my doubts using mobile internet browsing.	☐	☐	☐	☐	☐	⬭
12.	Teacher-student communications is facilitated by means of m-learning tools.	☐	☐	☐	☐	☐	⬭
13.	Global learners can access instructional websites with mobile technologies.	☐	☐	☐	☐	☐	⬭
14.	Mobile learning will save my time and energy.	☐	☐	☐	☐	☐	⬭
15.	I plan integrate mobile technologies in my future classroom teaching and learning.	☐	☐	☐	☐	☐	⬭
16.	Using mobile learning enhances my performance in online.	☐	☐	☐	☐	☐	⬭
17.	Using mobile learning enables me to download the teaching-learning materials.	☐	☐	☐	☐	☐	⬭
18.	I would like to be able to interact with teachers and classmates both inside and otuside class via smart mobile phones.	☐	☐	☐	☐	☐	⬭

Total Score Page 4 ☐

Sr. No.	STATEMENTS	Strongly Disagree	Dis-agree	Un-decided	Agree	Strongly Agree	SCORE
19.	I feel very happy through the use of mobile learning.	☐	☐	☐	☐	☐	⬭
20.	M-learning encourage my speed of learning.	☐	☐	☐	☐	☐	⬭
21.	Mobile learning allows me to evaluate my own learning performance.	☐	☐	☐	☐	☐	⬭
22.	I intend to use mobile learning to accomplish my academic works.	☐	☐	☐	☐	☐	⬭
23.	I use mobile devices for searching educational contents.	☐	☐	☐	☐	☐	⬭
24.	I do not have much knowledge about mobile learning.	☐	☐	☐	☐	☐	⬭
25.	I think mobile devices cannot be used for effective teaching-learning process.	☐	☐	☐	☐	☐	⬭
26.	M-learning decrease my learning capabilities.	☐	☐	☐	☐	☐	⬭
27.	I realized mobile applications useful for me.	☐	☐	☐	☐	☐	⬭
28.	I use m-learning technologies effectively with my existing knowledge.	☐	☐	☐	☐	☐	⬭
29.	I feel difficult to use m-learning applications in my studies.	☐	☐	☐	☐	☐	⬭

Total Score Page 5 ☐

Sr. No.	STATEMENTS	Strongly Disagree	Dis-agree	Un-decided	Agree	Strongly Agree	SCORE
30.	I can interact with my teachers with the use of mobile device.	☐	☐	☐	☐	☐	⬭
31.	I cannot learn anything without mobile device.	☐	☐	☐	☐	☐	⬭
32.	M-learning enhance my current updated knowledge's.	☐	☐	☐	☐	☐	⬭
33.	I can easily find meaning of the difficult word with the help of mobile dictionary.	☐	☐	☐	☐	☐	⬭
34.	Playing the mobile games develop my critical thinking and problem solving ability.	☐	☐	☐	☐	☐	⬭
35.	I use the mobile devices for sharing the data with help of mobile apps (Share it, Xender, Blue tooth).	☐	☐	☐	☐	☐	⬭
36.	I access the mobile devices with wifi connection for my studies.	☐	☐	☐	☐	☐	⬭
37.	I pay the exam fee through online with the help of mobile device.	☐	☐	☐	☐	☐	⬭
38.	I stored the information in online cloud computing by using mobile Phone.	☐	☐	☐	☐	☐	⬭
39.	I have not yet used a mobile device to learn new information.	☐	☐	☐	☐	☐	⬭
40.	I feel learning through mobile technologies increases my efficiency.	☐	☐	☐	☐	☐	⬭

Total Score Page 6 ☐

Sr. No.	STATEMENTS	Strongly Disagree	Dis-agree	Un-decided	Agree	Strongly Agree	SCORE
41.	I think learning via mobile phone is boring.	☐	☐	☐	☐	☐	◯
42.	I feel m-learning is not a user friendly learning.	☐	☐	☐	☐	☐	◯
43.	Using un-aware mobile apps frustrated me.	☐	☐	☐	☐	☐	◯
44.	I think m-learning courses are uncomfortable for me.	☐	☐	☐	☐	☐	◯
45.	I believe that m-learning provides me with rich resources.	☐	☐	☐	☐	☐	◯
46.	I think m-learning provides massive education for learners.	☐	☐	☐	☐	☐	◯
47.	I realize m-learning provides efficiency in teaching-learning.	☐	☐	☐	☐	☐	◯
48.	I think m-learning maximizes the cost of teaching and learning.	☐	☐	☐	☐	☐	◯
49.	M-learning is not an easiest learning method.	☐	☐	☐	☐	☐	◯
50.	M-learning device helps me access relevant information.	☐	☐	☐	☐	☐	◯
51.	M-learning is difficult to handle and therefore frustrating to use.	☐	☐	☐	☐	☐	◯

Total Score Page 7 ☐

Sr. No.	STATEMENTS	Strongly Disagree	Dis-agree	Un-decided	Agree	Strongly Agree	SCORE
52.	M-learning is useful for providing access to educational resources inside and outside the classroom.	☐	☐	☐	☐	☐	⬭
53.	M-learning is easily adoptable learning for mobile internet users.	☐	☐	☐	☐	☐	⬭
54.	I enjoy learning through mobile devices.	☐	☐	☐	☐	☐	⬭
55.	M-learning increase the pedagogic value of a course.	☐	☐	☐	☐	☐	⬭
56.	M-learning can provide quick and fast information dissemination to learners.	☐	☐	☐	☐	☐	⬭
57.	M-learning is not effective for student learning.	☐	☐	☐	☐	☐	⬭
58.	I access mobile internet for searching subject related information and update my knowledge.	☐	☐	☐	☐	☐	⬭
59.	M-learning is not increase the quality of teaching-learning.	☐	☐	☐	☐	☐	⬭
60.	I access subject related e-lectures through my mobile device.	☐	☐	☐	☐	☐	⬭
61.	M-learning facilitates any time any where learning.	☐	☐	☐	☐	☐	⬭
62.	I access the e-journals, e-books with the help of internet connected mobile devices.	☐	☐	☐	☐	☐	⬭

Total Score Page 8 ☐

APPENDIX-V: RAW SCORE DATA

SchoolType Gender Qualification WorkExperience TMLAS1 TMLAS2 TMLAS3 TMLAS4 TMLAS5 TMLAS6 TMLAS7 TMLAS8 TMLAS9 TMLAS10 TMLAS11 TMLAS12 TMLAS13 TMLAS14 TMLAS15 TMLAS16 TMLAS17 TMLAS18 TMLAS19 TMLAS20 TMLAS21 TMLAS22 TMLAS23 TMLAS24 TMLAS25 TMLAS26 TMLAS27 TMLAS28 TMLAS29 TMLAS30 TMLAS31 TMLAS32 TMLAS33 TMLAS34 TMLAS35 TMLAS36 TMLAS37 TMLAS38 TMLAS39 TMLAS40 TMLAS41 TMLAS42 TMLAS43 TMLAS44 TMLAS45 TMLAS46 TMLAS47 TMLAS48 TMLAS49 TMLAS50 TMLAS51 TMLAS52 TMLAS53 TMLAS54 TMLAS55 TMLAS56 TMLAS57 TMLAS58 TMLAS59 TMLAS60 TMLAS61 TMLAS62 totalScore 1 4 5 9 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 4 4 4 2 2 2 2 4 2 2 2 2 2 2 4 2 4 2 2 2 2 2 2 4 2 4 2 2 2 2 2 4 2 2 4 4 4 148 2 4 6 7 4 4 4 4 2 4 4 4 4 4 4 4 4 2 4 4 4 2 4 4 4 4 2 2 2 4 4 4 4 2 5 5 2 5 5 4 5 4 4 1 4 3 4 4 2 2 2 2 4 3 4 4 3 3 4 2 4 4 4 4 4 220 1 4 6 8 4 4 4 4 4 4 5 2 3 4 4 4 4 4 2 4 4 4 3 2 2 2 4 3 1 2 4 3 2 4 5 4 5 1 4 4 5 4 5 4 5 1 1 2 4 4 3 3 2 4 4 3 4 3 2 4 2 4 4 4 4 4 212 1 4 5 9 3 3 4 4 3 4 4 4 4 4 4 3 4 3 4 3 4 4 4 3 4 3 3 3 3 2 4 3 3 4 3 4 4 2 4 3 3 4 3 2 2 4 4 4 3 3 3 2 4 3 3 3 3 3 3 3 4 3 3 3 206 1 4 5 9 4 4 4 4 4 4 4 5 4 5 5 4 4 4 4 4 4 3 4 4 4 5 4 1 1 4 4 4 4 4 4 5 5 5 1 2 3 3 2 2 4 3 4 5 2 4 2 4 1 4 4 4 4 4 4 5 4 3 4 4 2 4 3 227 2 4 6 9 4 4 4 4 2 4 4 4 4 2 4 2 4 2 3 4 4 2 2 2 2 2 4 4 2 2 4 4 4 4 4 4 4 2 3 4 4 4 4 2 2 4 4 4 2 2 2 2 2 4 2 2 4 2 4 4 2 4 4 4 4 4 4 200 2 3 5 9 4 4 5 4 4 4 4 4 4 4 5 3 5 3 3 4 5 4 4 4 4 4 5 4 4 4 5 5 2 4 4 4 5 3 4 4 4 3 4 4 3 3 4 3 4 4 4 3 2 4 3 5 4 3 3 4 4 4 2 3 4 3 237 1 4 5 9 4 4 4 4 4 4 4 4 4 4 5 5 5 5 4 4 4 4 4 4 4 5 5 4 4 4 4 4 2 5 3 4 5 4 5 4 4 4 4 4 4 4 2 3 2 4 4 4 3 2 4 4 4 4 4 4 4 4 5 2 4 4 4 245 2 4 6 9 5 4 4 4 4 4 4 4 4 2 4 4 4 4 3 4 4 4 4 4 4 4 4 4 4 4 2 4 4 4 4 2 4 4 4 4 4 4 4 4 4 4 4 4 2 4 4 4 2 4 4 4 4 4 4 4 4 4 4 4 4 3 2 4 2 3 3 4 3 2 4 4 4 4 4 4 4 4 4 2 4 4 4 230 1 3 6 8 4 4 4 3 4 4 3 4 3 4 3 4 4 4 4 4 4 3 3 3 3 4 2 3 3 4 4 2 4 4 4 4 2 4 3 3 2 4 4 4 4 2 4 2 4 4 4 4 2 2 4 4 4 4 3 3 4 3 4 3 4 4 4 216 2 4 5 9 4 4 4 4 4 4 4 4 5 5 5 4 4 4 5 4 4 4 4 4 4 5 4 4 2 4 4 4 2 4 4 4 4 4 4 4 2 4 4 5 4 4 2 3 2 4 4 4 2 2 4 4 4 4 4 3 4 4 4 2 4 4 4 236 2 3 6 9 4 4 4 4 3 5 5 4 4 5 5 3 4 4 3 3 4 4 3 4 3 4 4 4 1 4 4 4 4 4 2 4 4 4 4 4 4 3 4 4 2 2 4 3 4 4 4 2 1 4 4 3 4 4 4 4 2 4 4 4 4 4 227 2 3 6 9 4 5 4 4 4 5 5 5 4 2 5 4 5 3 3 4 5 3 4 4 4 4 4 4 4 4 4 2 5 2 5 5 2 5 2 5 5 4 4 2 2 2 4 4 4 4 4 2 5 4 2 5 5 4 4 3 5 2 5 5 5 242 2 3 5 9 4 3 3 2 4 4 4 3 2 4 2 4 4 3 3 4 3 2 2 3 4 4 2 3 4 4 4 2 4 5 4 5 3 4 4 5 4 4 3 4 4 5 5 2 3 4 4 2 4 4 5 3 4 3 4 4 4 2 3 4 4 220 1 3 6 9 4 4 4 4 4 5 4 4 4 2 2 4 4 4 4 4 4 4 4 3 4 3 4 4 4 4 4 4 4 2 4 4 4 4 3 4 3 4 2 4 4 4 3 2 4 5 4 4 3 2 4 3 4 3 3 4 4 2 4 2 4 4 4 225 2 3 6 9 4 4 4 4 4 5 5 4 4 4 5 3 4 4 3 3 4 3 4 3 3 4 4 3 3 4 4 4 3 4 4 4 4 2 4 4 4 2 4 4 3 4 3 4 4 3 3 3 2 4 4 4 4 4 4 3 4 3 4 3 4 4 4 228 2 4 5 9 4 4 4 4 2 4 4 4 4 2 4 4 4 4 3 4 4 4 2 2 4 2 4 4 2 2 4 4 2 2 4 4 2 4 3 4 4 2 4 3 4 4 4 4 4 2 4 4 2 4 2 208 2 3 6 9 4 3 4 4 2 4 4 4 2 4 5 4 4 2 4 4 5 4 2 2 3 4 5 2 4 2 5 3 4 4 4 5 5 2 4 2 4 2 5 4 4 3 2 3 4 4 4 2 2 5 2 4 2 4 3 4 4 4 2 4 5 4 219 2 4 6 8 4 4 4 4 4 4 4 4 4 3 4 3 4 3 4 3 4 4 3 3 3 4 4 3 4 4 4 2 4 4 4 4 4 4 4 4 4 4 3 3 4 3 4 4 4 3 3 3 4 4 4 4 3 3 4 3 3 4 3 4 3 4 4 4 227 2 4 5 9 4 2 3 3 3 4 4 4 3 2 4 2 4 2 2 2 4 4 2 2 2 2 4 2 5 1 3 5 4 4 5 2 4 1 4 4 4 4 4 2 2 2 2 2 4 1 3 2 3 4 4 2 4 2 2 3 2 4 5 3 4 3 189 1 4 6 8 4 4 4 3 4 5 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 2 4 4 4 2 4 4 4 4 4 4 4 4 4 4 4 4 5 2 4 4 4 4 3 2 4 4 4 4 4 4 4 4 4 2 4 4 4 238 1 4 5 9 2 2 2 2 2 4 4 3 4 3 4 3 4

4 3 3 4 4 3 3 4 4 4 2 3 3 4 4 4 4 4 4 4 3 4 4 4 4 4 3 3 4 2 3 3 3 3 4 3 4 3 4 3 3 3 4 3 4 3 4 4 4 211 1 4 5 9

5 4 4 5 5 5 4 4 4 5 4 4 4 4 4 4 4 4 4 4 4 4 4 4 2 2 2 4 4 4 4 2 4 4 4 4 4 4 4 2 4 2 2 2 2 4 4 4 4 4 4 4 4 4 4 4

2 4 4 4 4 4 233 2 4 5 9 1 4 4 3 3 5 5 4 5 5 5 5 5 3 5 3 5 5 5 4 5 5 5 1 5 5 5 5 5 5 1 4 5 1 5 5 4 5 5 3 3 2 4

3 4 4 4 4 4 5 5 4 5 4 4 4 3 4 4 4 4 5 255 2 4 5 9 4 2 4 4 3 4 5 2 4 4 5 3 5 2 2 3 5 3 2 2 4 4 4 2 1 2 3 4 2 4

4 4 5 4 4 3 2 2 4 3 2 3 1 2 3 4 3 4 5 4 4 3 4 3 4 4 2 4 4 4 4 2 206 1 3 6 9 3 2 3 2 2 4 4 3 3 4 4 2 3 4 3 3 4

2 4 3 3 3 4 4 3 4 4 5 4 4 4 4 4 1 5 4 4 3 4 4 1 3 2 3 4 4 3 3 3 4 3 4 4 4 3 3 4 4 3 3 2 4 208 2 4 6 9 4 4 4 4

4 4 4 4 4 4 4 4 4 2 2 4 4 4 2 4 4 4 2 4 4 4 4 4 4 4 4 4 4 2 4 4 4 4 4 4 4 4 4 2 4 4 4 4 4 4 4 4 2 2 4 4 1 4 4 4

4 4 229 2 3 6 8 4 4 4 4 4 4 4 4 4 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 3 4 4 4 4 3 4 4 4 4 4 4 4 3 3 4 4 4 4

4 4 4 4 4 4 4 4 4 4 4 4 2 4 4 4 240 2 3 6 7 4 4 4 4 4 4 5 4 4 3 4 4 4 4 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 3

4 4 4 4 4 4 4 4 2 4 4 4 4 3 2 4 2 4 4 4 4 4 4 4 4 2 4 5 4 238 2 4 6 8 4 4 4 4 3 5 2 4 4 1 4 2 4 4 3 4 4 4 4 4 4

4 4 4 2 4 4 4 4 2 4 4 4 3 2 2 4 4 4 3 2 3 2 4 4 3 3 4 4 4 2 5 4 4 2 4 2 4 4 4 4 4 218 1 3 5 9 4 4 3 4 4 5 4 4

4 2 4 3 4 4 3 4 4 4 4 4 4 4 4 1 4 4 4 5 4 4 4 5 5 2 4 4 4 4 5 4 3 3 3 2 4 4 4 4 4 4 3 4 4 4 4 4 2 4 2 4 4 4

233 2 4 6 9 4 4 4 4 4 4 4 4 4 5 5 4 4 4 4 4 4 5 4 4 4 4 4 4 4 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 2 2 4 5 4 5 2

4 2 4 4 4 4 4 4 4 2 4 4 4 242 2 4 6 7 4 4 4 4 4 4 5 4 4 4 4 3 5 4 5 5 5 4 5 5 5 4 5 5 5 1 5 5 5 1 5 5 5 2 4 5

5 5 5 5 5 4 2 5 4 4 4 1 5 4 1 5 5 5 4 5 1 5 5 5 5 5 262 2 3 6 8 1 1 1 1 3 1 1 3 1 1 1 1 1 3 1 3 4 4 4 3 3 4 4

4 4 4 4 4 3 1 4 3 1 3 3 4 1 4 4 4 3 4 3 4 4 4 4 3 3 4 4 4 1 1 1 1 3 1 3 4 1 1 166 2 4 5 7 3 2 2 4 2 4 4 4 3 4

4 4 4 4 4 4 4 4 4 4 4 4 5 4 2 2 4 4 2 4 4 4 4 4 4 4 2 5 2 4 2 2 3 2 3 4 4 3 3 1 4 2 4 4 4 3 4 2 4 3 4 4 2 211 2

4 6 8 4 4 4 2 3 5 5 4 4 4 5 3 4 4 2 4 4 4 4 4 4 4 5 4 4 4 4 4 2 5 4 4 5 4 5 4 4 4 1 5 4 2 3 4 2 3 4 4 4 2 4 4 4 4

4 4 4 4 4 3 4 4 2 234 2 3 6 9 4 3 4 4 3 4 4 2 4 5 4 3 4 4 4 3 4 4 3 3 4 4 4 2 4 4 4 4 2 4 4 4 4 3 4 4 4 4 4 3

3 3 2 4 4 3 4 4 2 4 4 4 4 4 4 4 4 4 4 2 4 4 4 226 2 4 5 8 4 4 4 2 2 4 4 2 2 4 4 2 4 2 2 2 4 4 2 2 2 2 4 2 2 2 4

4 2 2 4 4 4 4 4 4 4 2 2 4 2 2 2 2 4 2 2 4 2 4 4 2 2 2 2 4 4 2 2 4 182 2 4 6 8 2 2 2 4 2 4 4 3 3 2 4 2 4 4

3 4 4 2 2 2 4 2 4 2 1 4 4 3 2 4 4 4 4 4 4 4 4 4 4 2 2 1 2 2 4 4 3 4 1 4 2 4 4 4 2 4 2 4 4 4 4 4 196 2 4 6 7 3

3 4 4 3 4 4 4 4 4 4 3 4 4 4 4 4 4 4 4 4 4 4 4 2 2 4 4 4 4 4 3 4 4 4 4 4 4 4 2 4 2 4 2 4 4 4 4 4 2 4 2 4 4 4 4 4 2

4 2 3 4 4 224 2 4 5 8 4 4 3 4 2 4 4 4 2 2 4 3 4 2 2 2 3 3 2 2 2 2 3 4 5 2 3 3 4 4 5 3 4 1 5 3 5 2 4 3 3 3 3 3

3 3 3 4 1 4 2 4 5 3 4 4 2 4 3 2 4 4 198 2 4 6 8 1 2 4 4 4 4 4 4 4 2 4 4 4 4 3 4 4 4 4 4 4 4 4 4 2 4 4 4 4 4 4

4 5 2 4 4 4 2 4 4 3 3 4 4 4 3 4 2 4 4 4 4 4 4 4 4 4 2 4 2 4 4 2 224 2 4 6 8 3 3 3 3 4 4 4 3 3 4 5 4 4 4 4 4 4 4

3 4 2 4 4 4 2 4 4 4 4 4 4 2 3 4 2 4 2 4 4 4 3 3 3 2 2 3 3 3 4 2 4 3 4 4 3 3 3 2 4 3 3 4 4 211 2 3 6 9 4 4 3 4 3

4 4 4 4 3 4 4 4 4 3 4 4 3 4 4 4 3 4 3 2 4 4 2 2 4 4 4 4 3 4 4 4 3 4 4 4 4 3 3 3 4 4 3 3 2 4 3 4 3 4 3 3 2 4 3 4 3

4 218 1 4 5 7 2 3 2 2 2 4 4 4 4 4 5 3 4 4 1 2 4 2 3 2 2 2 3 3 1 3 3 4 2 4 4 4 4 1 4 2 4 4 4 4 3 3 3 2 3 2 2 2

2 4 3 4 2 2 2 4 1 4 4 4 4 4 187 1 4 5 9 5 5 5 5 5 5 5 4 4 4 4 1 4 1 4 4 4 4 4 4 4 4 5 5 4 5 5 4 4 5 4 5 5 1 4

4 4 3 4 1 1 1 2 2 4 3 1 5 1 5 5 5 5 5 1 5 1 5 5 5 5 5 238 2 4 5 8 2 2 2 3 3 4 4 2 2 2 4 4 3 4 3 3 4 3 3 3 4 3

4 2 2 2 3 4 4 4 2 4 4 3 4 2 2 4 4 4 4 1 2 4 3 2 2 4 2 4 2 4 4 4 2 4 4 4 4 4 4 2 3 194 2 4 5 9 4 4 4 4 3 4 4 4 4

5 5 3 4 4 3 3 4 3 3 4 4 4 5 4 3 4 4 4 4 4 4 4 4 5 3 5 4 5 4 4 4 4 4 4 4 4 5 4 4 3 4 4 4 4 4 4 3 3 4 3 5 2 4 4 4 242

1 4 6 9 2 2 3 2 2 4 5 2 3 2 4 2 4 2 3 4 4 4 2 2 4 2 4 4 2 2 3 4 4 4 4 2 4 2 4 2 2 2 4 3 2 2 3 3 2 3 4 2 4 4 4 4

4 4 4 4 2 4 4 3 4 2 192 1 4 5 9 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 3 4 4 4 4 4 2 4 4 4 4 4 4 4 4 4 4 3 4 4 4
4 4 4 3 3 4 4 4 2 2 4 4 3 4 4 3 4 2 4 2 4 4 4 232 2 4 5 7 3 4 3 4 4 4 4 4 4 4 4 4 4 4 3 4 4 4 3 4 4 4 4 4 2 3
4 4 3 4 4 4 4 2 4 4 4 4 4 4 4 3 3 2 3 3 4 4 4 2 4 2 4 4 4 3 4 4 4 3 4 4 4 226 2 3 5 7 4 3 4 4 3 4 4 4 4 4 4 4 4
4 4 3 4 4 4 4 4 4 4 3 4 4 4 4 4 4 4 4 5 3 4 4 4 4 4 4 4 3 3 4 4 3 4 2 2 4 4 4 4 3 3 4 3 4 2 4 4 4 232 2 4 5 9
2 2 2 3 4 4 4 2 3 2 4 4 4 2 2 3 4 4 3 3 4 3 4 3 3 2 3 4 3 4 4 3 4 2 4 2 4 4 4 3 2 2 2 3 3 2 2 4 1 4 1 3 4 4 3 4
2 4 3 4 4 4 193 2 4 5 7 4 4 4 4 3 5 5 4 4 5 5 5 4 4 5 4 5 4 4 4 4 4 5 4 3 4 4 5 5 5 2 5 5 4 5 5 5 4 5 4 4 4 2
4 4 4 4 4 2 4 4 4 4 4 4 4 4 5 2 4 4 4 256 2 4 6 7 3 4 4 4 3 4 4 4 4 4 4 4 4 4 3 3 4 3 3 4 3 3 4 2 3 3 3 3 3 3
3 4 4 3 4 4 4 4 4 3 3 3 2 3 3 4 3 3 2 4 3 4 4 3 4 4 3 4 2 3 4 3 212 1 3 6 9 2 2 2 4 3 4 4 3 4 4 4 2 4 3 3 4 4
4 3 4 4 2 4 4 2 2 2 4 4 4 5 4 4 4 4 4 4 4 4 4 3 2 2 2 4 4 4 3 4 2 4 4 4 4 4 3 4 2 4 4 2 3 4 212 2 4 5 8 4 4 4 4
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 3 4 4 4 4 4 4 4 4 2 4 4 4 3 4 4 4 3 2 4 4 4 3 4 4 4 4 4 4 4 4 4 4 2 4
4 4 238 2 4 6 8 3 4 4 5 4 5 5 4 5 2 4 4 4 3 3 3 4 3 3 4 4 3 4 5 3 5 3 4 4 5 4 4 4 2 4 2 4 4 4 3 3 2 1 3 3 3 3
3 1 4 3 3 4 3 3 3 3 4 3 3 4 4 217 2 4 5 9 2 2 2 2 2 3 4 2 2 2 4 3 3 2 2 3 4 3 3 2 2 2 4 4 2 3 2 3 2 4 4 4 4 2
2 4 4 2 4 2 2 2 2 3 2 2 2 2 2 4 3 3 3 3 2 2 2 4 4 4 4 4 4 173 2 3 6 7 4 4 4 4 3 4 4 2 2 2 4 2 4 2 3 3 4 2 2 3 3
2 4 3 1 3 4 4 3 4 3 4 4 2 4 2 4 4 4 3 2 2 2 2 4 3 3 2 2 4 2 3 4 2 3 3 2 4 4 2 3 2 187 2 3 5 7 1 3 2 4 3 3 3 4
4 4 4 4 5 1 2 3 4 3 3 5 5 3 2 5 5 1 5 2 5 1 2 3 3 5 1 2 3 4 4 1 5 4 5 4 3 4 5 2 4 5 5 1 1 3 4 3 4 1 3 5 4 4
206 2 4 6 8 4 4 4 4 4 4 4 4 4 3 4 2 3 3 4 3 4 4 4 3 3 4 4 4 4 4 4 4 4 4 4 4 5 4 4 4 4 4 5 4 3 4 3 3 4 4 4 3 3
4 4 4 3 4 3 3 3 4 2 4 4 4 231 2 4 6 9 4 4 4 4 5 4 4 2 4 2 4 2 4 2 3 2 2 2 3 3 4 2 4 4 4 4 4 4 4 4 4 4 4 2 4 2
4 3 4 3 4 4 2 3 4 3 3 3 2 3 4 4 4 4 3 4 2 2 3 4 2 3 206 1 4 6 7 4 4 4 4 3 4 4 4 4 2 4 2 4 4 4 3 4 3 2 3 3 4 4
4 4 2 4 4 4 4 4 4 5 4 4 2 2 2 4 4 4 2 2 3 4 4 4 4 2 4 4 4 4 4 4 5 2 4 4 4 4 3 221 1 4 5 7 4 4 4 4 3 5 4 3 4 2
4 3 4 4 3 4 4 2 4 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 2 4 2 4 3 4 4 3 4 3 4 4 4 4 3 4 4 4 4 4 4 4 4 4 4 2 3 4 4 229 2
4 6 8 4 5 5 3 4 4 5 4 4 2 4 3 5 4 4 4 4 4 4 4 4 3 2 5 3 3 4 5 4 4 5 5 5 5 3 5 3 5 5 5 3 4 4 4 4 5 5 5 5 3 5 4 5 5
5 3 5 4 5 2 5 5 5 259 2 4 6 8 4 4 4 4 4 4 4 4 4 5 5 4 4 4 4 4 4 4 4 3 3 4 4 5 3 4 4 4 4 3 5 2 5 5 2 4 4 5 4 4 4
4 2 3 3 5 4 4 4 2 4 3 4 4 3 4 4 3 4 2 4 4 4 237 1 4 5 7 5 4 4 5 4 4 4 4 4 4 4 4 4 4 4 4 4 4 2 2 4 3 4 4 4 4 4 4
4 4 4 4 4 4 2 4 4 4 3 4 4 4 4 3 3 4 4 4 4 2 3 4 3 4 4 4 4 4 4 3 4 2 4 4 4 233 2 4 5 8 4 5 5 5 4 5 5 5 5 5 5 5 4
5 4 5 5 5 5 5 4 5 4 5 5 5 5 4 5 4 5 5 5 5 5 5 5 4 5 5 4 4 4 4 4 5 5 1 5 4 5 5 5 5 5 4 5 2 5 5 5 287 2 4 5 8 5
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 2 4 4 4 2 4 4 4 4 4 2 4 2 4 2 2 4 4 4 2 4 4 2 4 4 4 4 4 4 4 4 2 4 2
4 2 4 4 4 227 1 4 5 7 4 4 4 4 3 4 4 4 4 4 4 3 4 4 4 4 4 3 3 4 3 4 4 4 4 4 4 4 4 3 4 4 4 4 3 4 4 4 3 4 4 4 3 3 3 2
4 4 4 2 2 4 3 4 4 4 4 4 4 3 4 3 4 4 4 228 1 3 5 7 3 4 4 4 4 4 2 4 4 2 4 2 4 3 3 4 4 3 3 2 2 2 4 4 1 2 4 4 4 4 4
4 4 3 4 2 2 2 4 2 2 3 2 2 2 3 3 4 1 4 4 4 4 4 4 4 4 2 4 3 2 4 4 198 1 3 5 8 4 4 4 2 4 4 4 4 4 2 4 2 4 2 3 4 4 4
4 2 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 2 4 4 4 4 4 4 2 2 4 4 4 4 2 4 4 4 4 4 4 4 4 4 4 2 4 2 4 223 2 4 6 9 4 4 3 4 2
4 5 4 4 5 5 4 4 4 3 4 4 5 3 2 2 4 4 4 2 3 4 5 4 5 5 4 5 3 5 4 4 4 4 4 2 2 1 4 4 3 4 2 2 4 2 3 4 3 4 4 3 5 2 4 4
4 226 1 4 6 8 4 4 5 5 4 5 5 5 4 2 5 4 5 4 3 5 4 5 4 3 3 2 5 4 4 4 5 5 4 5 5 5 5 2 5 4 5 4 5 4 5 4 1 4 5 5 5 4
2 5 4 5 5 4 4 5 4 5 2 4 5 4 261 2 4 6 9 4 4 4 4 4 5 5 4 4 5 5 4 5 3 4 4 5 5 4 4 4 4 5 5 5 4 5 5 4 5 5 5 5 3 4
2 5 4 5 4 4 4 1 3 4 3 3 3 2 4 4 4 5 4 4 4 4 5 1 4 4 4 252 1 4 5 9 2 2 4 3 2 4 4 3 4 2 5 4 4 4 3 4 5 5 3 3 2 3

4 2 1 4 3 4 2 4 4 3 5 1 4 4 4 2 4 4 2 2 2 2 4 3 4 3 2 4 4 4 4 3 3 4 2 4 4 2 4 2 202 2 4 6 9 4 4 3 4 3 5 4 3 4
2 4 4 4 2 3 4 4 4 3 3 2 2 4 4 2 2 4 4 4 4 5 4 4 2 4 4 4 3 4 4 3 2 2 3 4 4 4 3 3 4 4 4 4 4 3 4 2 4 4 4 3 4 217
1 4 5 9 4 5 5 4 3 5 5 4 4 4 5 4 4 5 4 4 5 4 4 4 4 4 5 4 4 5 4 4 4 4 4 4 5 3 4 4 4 4 4 4 4 4 3 4 4 4 4 3 3 5 4 4
4 4 4 4 3 5 3 4 4 3 252 2 4 6 8 5 5 5 4 5 5 5 5 5 2 5 2 4 4 4 4 4 4 4 4 4 4 5 4 5 5 5 5 4 4 5 4 5 1 5 4 4 3 4
4 4 2 2 2 4 5 4 2 2 5 4 4 5 4 4 5 4 4 2 4 5 3 249 1 3 6 7 5 5 5 5 5 5 5 5 5 5 5 5 5 5 4 5 5 5 4 5 5 5 5 4 5 5
5 5 4 5 4 5 5 5 5 5 5 3 5 5 5 5 4 5 5 5 5 1 4 5 5 5 5 5 5 5 5 5 1 5 5 5 293 2 4 5 8 4 4 4 4 4 4 4 4 4 4 5 4 4
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 2 4 4 2 4 2 4 4 4 4 4 4 4 4 4 4 4 4 2 4 4 4 4 4 4 4 4 4 2 2 4 4 237 2 4 6 7
4 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 3 4 4 4 4 4 2 2 3 4 2 4 4 4 4 4 4 4 4 4 4 4 3 2 2 3 4 4 4 4 2 4 4 4 4 4 4
2 4 3 4 4 4 228 2 4 6 8 4 4 4 4 4 4 5 5 5 5 5 5 4 4 3 4 5 4 4 5 5 4 4 4 4 4 4 4 4 4 2 4 5 1 5 5 5 5 5 5 5 5 5
5 5 5 4 2 4 5 5 5 5 4 5 5 5 1 4 5 5 269 2 4 5 8 4 3 4 4 4 5 5 4 4 3 4 4 4 2 4 4 4 4 2 4 4 4 4 5 2 4 4 4 2 4
5 4 4 2 4 2 4 4 5 4 4 2 2 3 3 4 4 4 2 4 4 4 4 4 2 4 2 4 3 4 4 4 226 1 4 6 9 4 4 4 3 4 4 4 4 4 2 4 4 4 4 4 4 4
4 4 4 4 4 4 4 4 5 4 4 4 5 5 4 5 2 4 2 4 4 4 4 4 3 2 4 4 4 4 2 4 4 4 2 4 4 4 4 4 4 4 2 4 5 4 237 1 4 6 9 3 2 3 2
2 4 2 2 2 2 2 4 4 2 4 4 2 4 3 2 4 4 4 4 3 2 4 2 3 4 2 4 4 5 4 4 4 4 2 4 2 2 3 4 2 3 3 4 1 4 4 4 4 2 3 3 3 3 3 3
3 4 193 2 3 5 9 4 4 4 4 3 4 5 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 5 4 4 4 4 4 4 4 4 3 4 4 4 4
4 2 4 4 4 4 4 3 4 4 4 2 4 4 4 243 2 4 6 8 4 4 4 4 4 4 4 5 4 5 4 4 4 4 3 3 4 4 4 4 4 4 4 2 3 4 4 4 4 4 4 4 5 5 3
4 2 4 4 4 4 3 4 2 4 4 4 4 2 2 4 4 5 4 4 4 4 2 4 2 4 4 4 234 2 3 5 7 4 4 4 4 4 4 3 4 4 4 4 2 3 4 3 5 4 5 4 4 4
3 5 4 2 4 3 4 3 2 3 4 5 1 2 2 4 2 4 4 2 4 2 2 2 4 2 3 2 4 2 3 4 4 2 4 3 4 2 4 4 4 209 2 4 6 7 4 4 4 4 4 4 5 4
4 3 5 4 4 3 3 4 4 4 4 3 4 4 4 4 4 4 4 5 5 5 5 5 4 5 4 5 1 5 4 5 4 4 3 4 4 4 4 4 2 2 4 4 4 4 4 4 4 4 3 4 2 4 4 4
244 2 4 6 8 3 3 3 4 2 4 5 4 3 2 4 3 4 4 3 4 4 4 2 3 4 2 4 2 2 3 4 4 4 4 3 4 5 4 5 2 5 2 4 4 3 3 1 2 3 3 3 3 2
4 2 4 4 3 3 3 3 4 3 4 4 4 207 2 4 6 9 4 4 3 3 4 5 5 4 4 4 5 4 4 5 4 4 4 4 4 4 4 4 5 4 4 4 5 4 4 4 4 4 5 4 5 4
5 4 5 4 4 4 4 4 4 4 4 2 2 4 4 5 5 4 3 4 4 4 2 4 4 5 252 2 4 6 8 4 4 4 2 2 5 5 3 4 4 4 5 4 3 2 2 4 4 3 4 3 4 5
4 4 4 4 4 4 4 5 4 4 3 2 4 4 2 5 3 4 4 2 4 4 4 3 3 2 4 4 4 1 4 3 4 4 1 3 2 3 4 219 1 4 6 8 4 4 4 3 3 4 4 3 4 4
4 3 4 3 3 3 4 4 2 2 4 2 4 3 3 4 4 4 2 4 5 4 4 3 4 4 2 4 4 3 3 3 2 3 4 4 2 2 2 4 3 4 3 4 3 4 4 4 3 3 3 4 211 2
4 6 7 4 4 4 4 2 4 4 4 4 2 4 4 4 4 4 4 4 4 4 2 3 2 4 4 4 4 4 4 4 4 5 4 4 5 2 5 4 2 4 4 4 3 4 4 4 4 4 4 2 2 4 4 4 5
3 2 4 3 4 4 4 4 4 230 2 4 6 8 4 4 4 4 4 4 5 4 4 4 4 4 4 4 3 4 4 2 4 4 4 2 4 4 2 4 4 4 4 4 5 4 4 4 4 4 4 4 5 4
4 4 4 4 4 4 4 4 2 4 4 2 4 4 4 4 3 5 2 4 4 4 238 2 4 6 9 3 3 3 4 3 4 4 3 4 3 4 4 4 4 3 4 4 4 3 3 3 3 4 4 2 3 4
4 4 4 4 4 4 2 4 4 4 4 4 4 3 3 4 2 3 4 4 4 3 3 2 4 3 4 4 4 3 4 3 4 3 4 4 4 4 219 2 4 6 8 4 3 4 4 4 5 4 4 4 3 5 3 4 4
2 3 4 4 2 3 3 2 4 3 3 2 4 3 4 3 5 3 4 2 2 2 4 4 4 3 2 2 2 3 3 3 1 3 2 4 3 4 4 3 2 4 2 4 4 3 4 3 202 2 4 5 7 4
4 4 4 4 4 4 4 4 5 4 4 4 4 4 4 4 4 4 4 4 4 4 4 2 4 4 4 4 4 4 4 5 3 4 2 2 2 4 4 2 3 3 4 4 4 4 2 2 4 4 4 4 4 4 4 3
4 2 4 4 2 228 2 4 5 7 3 3 3 4 4 3 4 3 4 4 4 3 4 4 2 4 4 4 4 4 4 4 2 4 2 2 3 2 2 2 4 3 4 4 2 4 3 4 3 3 4 2 3 3 2
3 4 3 3 2 3 3 3 4 3 3 3 1 4 4 3 4 3 199 1 4 6 9 4 4 4 4 3 3 4 3 4 3 4 2 4 3 3 4 4 4 3 3 4 4 4 2 4 3 3 4 2 2 4
4 4 2 2 4 4 2 4 4 2 3 2 3 4 3 2 3 2 4 2 4 4 2 2 4 2 4 3 4 3 4 202 2 4 5 9 4 5 4 4 5 5 5 4 4 5 5 5 4 5 4 5 5 5
4 5 4 4 5 4 5 4 4 4 5 4 4 4 5 4 4 5 4 4 5 4 4 4 4 5 4 4 4 2 4 4 4 5 5 5 4 4 4 4 2 4 4 4 266 1 4 5 7 1 1 1 4 1
1 4 4 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 2 1 5 5 5 5 5 5 5 4 5 5 5 5 3 5 1 3 1 2 5 5 5 5 1 4 1 5 5 5 5 5 2 5 5 4 5

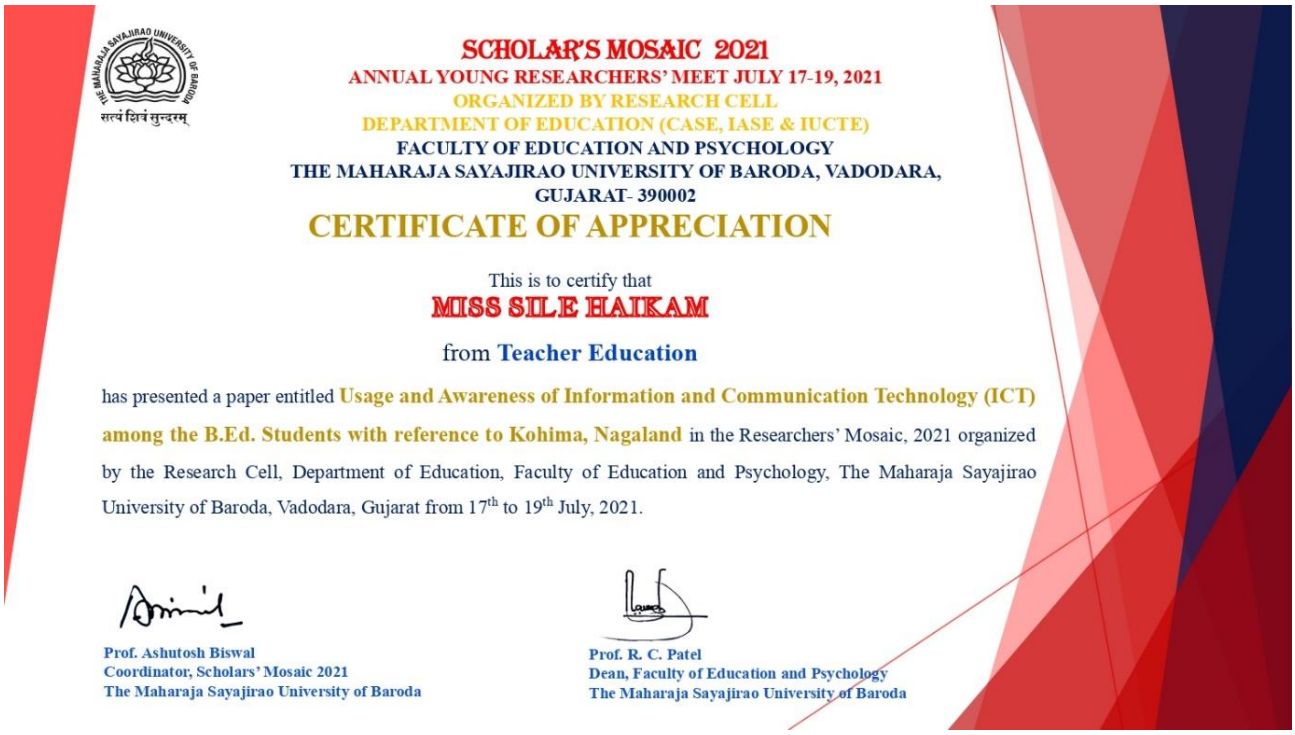
5 249 1 4 5 7 5 5 1 1 1 5 5 5 5 5 5 5 5 4 5 5 5 5 5 5 5 1 1 1 5 5 1 5 5 5 5 5 5 5 5 1 5 1 1 1 1 5 5 5 5
1 5 1 5 5 5 5 5 1 5 5 5 5 5 249 1 4 5 7 5 5 4 1 5 4 2 3 2 3 4 1 2 2 5 3 4 4 4 2 1 3 2 3 1 4 5 2 1 2 5 4 5 1 5
2 5 5 1 5 1 1 2 2 4 3 4 4 3 3 1 4 5 5 5 5 1 4 4 5 5 5 203 1 4 6 9 5 5 4 4 4 5 5 4 4 4 5 5 5 4 5 5 5 5 5 4 5 4
5 5 5 5 5 4 5 5 5 5 5 4 5 5 5 4 5 5 4 4 4 4 5 5 5 2 2 5 4 5 5 4 4 5 2 4 2 4 4 5 276 2 4 6 7 4 4 4 4 4 4 4 4 4
4 4 4 4 4 4 4 4 3 3 4 3 4 4 2 2 3 4 4 2 4 3 4 4 4 4 3 4 4 3 4 3 3 3 3 4 3 4 4 3 4 3 4 4 4 4 4 3 4 3 4 4 4 226
1 3 6 8 4 4 4 5 4 4 5 4 4 4 4 3 4 5 3 5 5 4 3 4 3 4 4 2 1 2 3 4 3 4 4 4 5 2 5 3 2 4 4 4 3 3 2 1 3 3 3 2 2 4 3 4
4 3 3 4 2 4 4 2 4 4 216 1 4 6 9 3 3 4 3 4 4 4 4 3 3 4 3 3 4 3 3 4 4 3 3 4 4 4 3 1 3 4 3 3 4 2 4 4 4 2 4 5 4 3
4 3 3 3 3 3 3 3 3 3 4 3 4 4 4 3 4 2 4 4 4 4 3 212 2 3 6 7 3 1 1 1 1 1 1 1 1 1 1 3 1 3 3 1 1 1 1 1 1 1 4 4 4
1 1 4 1 4 1 1 2 1 1 1 4 1 4 4 4 4 2 1 1 1 4 1 5 1 1 1 1 1 5 1 1 1 1 1 113 2 4 5 9 4 4 5 4 5 5 5 4 4 5 5 4 5
2 4 5 5 5 4 2 4 4 5 4 2 2 4 4 4 5 4 5 5 4 4 5 5 4 5 5 1 2 5 1 4 4 1 2 1 4 1 4 4 4 1 4 1 5 4 4 4 4 235 2 4 6 7
1 4 5 4 4 5 2 2 5 4 5 4 5 5 3 5 5 5 4 3 4 4 5 5 5 5 5 4 5 5 5 5 5 1 5 5 2 5 4 4 4 2 2 4 4 4 4 4 1 5 4 4 4 4 4 5
4 4 2 4 4 5 250 2 4 5 8 4 3 3 4 4 4 4 4 3 4 4 4 3 3 2 2 3 4 2 2 3 3 4 2 2 2 2 4 2 4 2 4 4 2 4 3 4 3 3 3 2 2 2
1 3 4 3 3 1 4 1 4 4 1 2 5 1 4 5 3 4 3 188 1 3 5 9 4 4 2 5 4 5 4 4 4 4 5 3 5 5 4 5 5 2 3 4 4 4 4 4 1 1 4 5 3 4
4 4 5 3 5 5 5 5 4 4 2 2 2 3 4 4 5 5 2 5 4 5 5 5 5 5 1 5 4 5 5 5 247 2 4 6 8 1 1 1 2 2 5 5 3 2 2 4 2 3 2 2 3 3
2 2 2 2 2 4 2 2 2 3 3 2 4 4 3 4 2 4 2 4 3 4 3 2 3 3 4 2 2 4 2 2 4 3 2 3 2 2 4 2 4 4 4 3 2 171 1 4 5 9 4 4 4 5
5 5 4 4 5 4 5 3 5 5 5 5 5 4 5 5 5 3 5 2 2 4 5 5 2 4 4 5 5 3 5 4 4 4 4 4 4 3 2 2 4 4 4 5 1 5 4 5 5 4 4 4 4 5 2 4
4 4 253 2 4 5 8 2 2 1 4 1 3 2 2 1 4 5 3 4 3 1 1 1 4 2 2 5 5 5 2 1 1 4 4 2 4 1 5 5 1 5 1 4 4 4 4 2 3 2 2 4 5 4
2 2 4 2 4 4 2 4 4 2 5 4 4 5 2 187 1 4 5 8 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 1 5 5 5 5 5 5 5 5 5
5 3 4 4 5 5 5 5 5 5 5 5 5 1 4 5 5 5 5 5 5 5 5 5 1 5 5 4 292 2 4 6 7 4 2 2 2 4 4 4 2 2 5 4 4 4 4 4 5 2 4 4 4 4
3 4 4 1 2 4 4 4 4 4 4 5 3 5 4 5 4 1 4 4 4 5 5 4 2 3 4 4 5 5 4 5 4 3 4 4 4 4 4 5 3 232 2 3 5 9 3 4 4 4 4 4 4
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 3 4 4 4 4 4 4 4 4 3 4 4 4 4 4 4 4 3 2 3 4 4 4 4 2 4 3 4 4 4 4 4 3 4 2 4 4 4
235 2 4 6 9 2 2 2 2 2 4 4 2 2 2 4 2 2 2 2 2 2 2 2 2 2 2 4 2 2 2 2 2 2 4 4 4 4 2 4 4 4 4 4 2 2 2 2 2 2 2 2 2 2
2 2 2 2 2 2 2 2 2 4 4 2 4 156 2 4 6 7 3 3 2 4 2 5 5 4 4 2 5 3 4 3 3 4 5 4 3 3 3 4 4 3 2 3 4 4 4 5 4 4 5 4 5 4
5 4 5 4 4 3 2 4 4 4 4 4 4 2 4 3 4 4 3 3 4 4 4 2 4 4 4 229 2 3 5 9 5 5 4 4 4 4 4 4 5 4 5 4 4 4 4 4 5 5 4 4 4 4 5
4 4 2 5 5 2 4 2 4 4 2 4 4 3 4 4 4 4 4 4 4 4 2 4 4 5 4 4 4 4 4 4 4 4 4 2 4 4 4 245 1 3 6 9 5 4 4 4 3 5 5 2 4 2
5 4 5 4 4 3 5 4 2 2 4 3 4 4 2 4 5 4 4 5 4 4 5 4 4 4 4 4 4 4 4 4 4 1 4 5 3 4 2 3 4 4 4 5 4 3 4 3 4 2 4 5 4 236 1
3 5 9 4 3 4 4 2 4 4 2 3 2 4 4 4 4 3 2 4 4 3 4 4 3 4 2 2 2 4 3 2 4 4 3 4 2 4 4 2 2 4 2 2 2 2 4 3 2 3 3 2 4 3 4 4
4 3 3 2 4 4 3 4 4 198 2 3 5 8 4 4 3 4 2 4 1 2 4 2 2 1 4 2 2 2 2 1 1 2 1 1 1 4 1 1 1 1 3 1 5 4 4 1 1 1 4 1 5 1
2 2 2 2 2 2 2 2 2 4 4 2 4 2 2 4 1 4 5 1 4 4 150 2 4 5 7 2 2 2 4 2 4 4 1 1 2 2 1 2 1 1 1 2 1 1 2 1 2 2 2 2 2 1
4 4 2 1 4 4 1 4 4 4 1 4 1 1 2 1 1 2 2 2 4 2 2 1 4 4 2 2 4 2 4 5 2 4 4 145 2 3 5 9 3 4 2 4 2 4 4 2 3 2 4 4 4 4
3 2 4 4 3 3 3 3 3 2 2 4 4 4 2 4 4 4 5 2 5 4 2 2 2 3 2 3 1 1 4 4 4 4 2 4 2 4 4 4 3 3 2 4 4 2 4 2 196 2 4 6 8 4
4 5 4 4 5 4 4 5 5 5 4 4 5 5 4 5 4 3 4 4 5 5 2 2 1 4 4 2 4 3 4 5 1 4 5 5 4 4 3 4 5 2 2 4 4 4 2 2 4 2 4 4 3 4 4 2
4 5 5 5 5 238 2 3 5 8 4 4 4 4 4 4 4 3 3 2 2 2 4 2 2 2 4 2 2 2 4 2 2 2 1 2 2 2 2 3 4 2 4 2 3 3 4 2 2 2 2 3 2 2
2 2 2 2 2 4 2 4 4 2 4 4 4 4 2 2 4 3 172 2 3 5 8 2 2 2 4 2 4 4 2 4 2 4 4 3 2 4 2 2 2 2 2 4 3 1 2 2 4 4 4 2 2 4

4 4 2 3 3 4 2 4 2 3 3 2 4 2 3 2 2 2 4 4 2 4 2 2 4 3 4 4 2 4 3 180 2 4 5 8 4 4 4 4 4 4 4 4 4 4 2 4 3 4 4 3 4 4 3
3 3 3 4 5 2 3 2 4 4 2 4 5 3 4 3 4 5 3 4 4 3 2 3 1 3 4 3 3 3 3 5 2 4 4 4 3 2 1 3 2 3 4 3 209 1 4 6 8 4 4 4 4 4
4 4 4 4 2 4 3 4 4 3 4 4 3 3 3 3 4 5 2 2 3 5 4 3 4 3 4 4 4 4 2 3 3 2 3 2 1 3 2 3 3 3 4 1 4 3 4 3 4 3 2 3 4 3 4 5
4 208 1 4 6 8 4 4 4 4 4 4 4 4 4 4 2 4 3 4 4 3 4 4 3 3 3 3 4 5 2 2 3 5 4 3 4 3 4 4 4 4 2 3 3 2 3 2 1 3 2 3 3 3 4
1 4 3 4 3 4 3 2 3 4 3 4 5 4 208 1 4 5 8 4 4 4 4 4 4 4 4 4 3 4 3 4 4 3 4 4 3 3 3 3 4 5 2 2 3 5 4 3 4 3 4 4 4 4
2 3 3 2 3 2 1 3 2 3 3 3 4 1 4 3 4 3 4 3 2 3 4 3 4 5 4 209 1 4 5 9 4 4 4 4 4 4 4 4 4 2 4 3 4 4 3 4 4 3 3 3 3 4
5 2 2 3 5 4 3 4 3 4 4 4 4 2 3 3 2 3 2 1 3 2 3 3 3 4 1 4 3 4 3 4 3 2 3 4 3 4 5 4 208 1 4 5 9 4 4 4 4 4 4 4 4 4
2 4 3 4 4 3 4 4 3 3 3 3 4 5 2 2 3 5 4 3 4 3 4 4 4 4 2 3 3 2 3 2 1 3 2 3 3 3 4 1 4 3 4 3 4 3 2 3 4 3 4 5 4 208
1 4 5 7 4 4 4 4 4 4 4 4 4 2 4 3 4 4 3 4 4 3 3 3 3 4 5 2 2 3 5 4 3 4 3 4 4 4 4 2 3 3 2 3 2 1 3 2 3 3 3 4 1 4 3 4
3 4 3 2 3 4 3 4 5 4 208 1 4 5 8 4 4 4 4 4 4 4 4 4 3 4 3 4 4 3 4 4 3 3 3 3 4 5 2 2 3 5 4 3 4 3 4 4 4 4 2 3 3 2
3 2 1 3 2 3 3 3 4 1 4 3 4 3 4 3 2 3 4 3 4 5 4 209 1 4 6 8 4 4 4 4 4 4 4 4 4 2 4 3 4 4 3 4 4 3 3 3 3 4 5 2 2 3
5 4 3 4 3 4 4 4 4 2 3 3 2 3 2 1 3 2 3 3 3 4 1 4 3 4 3 4 3 2 3 4 3 4 5 4 208 1 4 5 9 4 4 4 4 4 4 4 4 4 2 4 3 4
4 3 4 4 3 3 3 3 4 5 2 2 3 5 4 3 4 3 4 4 4 4 2 3 3 2 3 2 1 3 2 3 3 3 4 1 4 3 4 3 4 3 2 3 4 3 4 5 4 208 1 4 5 8
4 4 4 4 4 4 4 4 4 2 4 3 4 4 3 4 4 3 3 3 3 4 5 2 2 3 5 4 3 4 3 4 4 4 4 2 3 3 2 3 2 1 3 2 3 3 3 4 1 4 3 4 3 4 3 2
3 4 3 4 5 4 208 1 4 5 8 4 4 4 4 4 4 4 4 4 2 4 3 4 4 3 4 4 3 3 3 3 4 5 2 2 3 5 4 3 4 3 4 4 4 4 2 3 3 2 3 2 1 3
2 3 3 3 4 1 4 3 4 3 4 3 2 3 4 3 4 5 4 208 2 4 5 8 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 5 2 2 2 4 4 2 4
1 4 4 4 5 4 4 4 4 4 2 2 2 2 4 4 4 4 2 4 2 4 4 4 4 4 2 4 2 4 5 4 224 2 4 6 9 4 4 4 4 4 4 4 4 4 4 4 3 4 4 4 4 4
4 4 4 4 5 4 2 2 2 4 4 2 4 2 4 4 5 4 4 4 2 2 4 2 2 2 2 4 4 4 4 2 4 2 4 4 4 4 4 2 4 2 4 4 3 218 2 4 6 8 4 4 4 4
4 4 4 4 4 4 4 4 3 4 4 4 4 4 4 4 4 4 4 4 5 2 2 2 4 4 2 4 2 4 4 4 5 4 4 4 4 4 2 2 2 2 4 4 4 4 2 4 2 4 4 4 4 4 2 4 2 4
4 3 222 2 4 6 9 2 2 3 3 2 4 4 3 3 3 4 4 4 3 3 3 4 3 3 3 3 3 5 3 4 3 4 3 3 4 1 3 4 2 5 4 4 2 4 2 4 4 2 4 4 2 2
2 3 4 1 2 4 4 2 3 1 5 2 4 5 3 196 2 4 5 9 2 2 3 3 2 4 4 3 3 3 4 4 3 4 3 4 3 3 3 3 5 3 4 3 2 3 3 2 2 3 4 2 5
4 2 2 2 4 2 2 4 2 4 4 2 2 2 3 4 2 2 4 4 2 3 2 4 2 4 5 3 189 2 4 6 9 2 2 3 3 2 4 4 3 3 3 4 3 4 3 3 3 4 3 3 3 3
3 3 4 4 3 4 3 3 4 5 3 4 2 5 4 2 2 4 2 4 4 2 4 4 2 2 2 3 4 5 2 4 4 2 3 1 5 2 4 5 4 201 2 4 6 9 2 2 2 3 3 4 4 2
3 2 4 4 4 3 3 2 4 2 2 2 3 2 3 4 4 4 4 3 4 4 4 3 4 2 4 4 2 2 4 2 4 4 4 2 2 2 2 3 2 5 4 4 4 2 3 5 1 2 4 4 4 4
194 1 4 5 7 4 4 4 5 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 2 2 2 4 4 2 4 2 4 4 4 4 4 4 4 2 4 2 2 2 2 4 4 4 4 2
4 2 4 4 4 4 4 2 4 4 4 4 4 223 2 4 6 7 2 2 2 3 3 4 4 2 3 2 4 4 4 3 3 2 4 2 2 2 3 2 3 4 4 4 4 3 4 4 4 3 4 4 5 4
2 2 4 2 4 4 2 4 4 2 2 2 3 4 2 2 4 4 2 3 2 5 2 4 5 4 196 2 3 6 9 5 5 4 5 5 5 5 5 4 5 5 5 5 5 5 5 5 5 4 5 5 5
1 1 2 4 5 2 5 1 5 5 5 5 4 5 5 2 5 5 1 1 1 4 5 5 4 1 5 1 5 5 5 5 5 1 5 4 5 5 5 257 1 4 6 9 2 2 2 2 2 2 2 2 2 2
2 2 2 2 2 2 2 2 2 2 2 2 2 2 4 1 2 4 5 2 4 1 5 3 3 5 5 4 4 1 5 4 1 2 1 4 5 5 3 3 4 2 3 3 5 2 2 4 5 5 5 4 2 178 2
4 6 7 2 2 2 3 3 4 4 2 4 2 4 4 4 3 3 2 4 2 2 2 3 2 2 4 4 4 4 2 4 4 4 3 4 2 4 4 2 2 4 4 4 4 2 4 4 2 2 2 3 4 2 2 4
4 2 3 2 5 2 4 5 4 194 2 4 6 7 4 4 3 4 2 4 4 3 4 3 4 3 4 3 3 2 4 3 3 3 3 3 5 3 4 3 4 3 2 4 4 4 4 2 4 4 4 4 4 3
4 4 2 2 4 4 4 4 3 4 2 2 4 4 2 3 1 4 3 4 5 3 210 2 4 5 7 1 1 4 4 2 3 2 3 5 5 2 3 1 5 4 1 4 4 2 5 3 3 3 1 5 1 5
5 4 2 3 4 3 3 1 1 1 1 5 1 1 2 3 2 5 5 3 3 3 3 4 3 5 4 4 3 3 1 2 5 5 4 189 2 4 5 8 4 4 4 4 4 5 5 3 4 4 5 4 5 4
4 4 4 4 4 3 3 3 4 4 3 4 5 4 4 5 4 4 4 3 5 4 5 4 4 4 4 3 1 3 4 5 4 2 2 4 4 4 5 4 3 2 2 4 2 4 5 4 237 2 4 5 7 4

4 4 4 4 4 4 3 4 3 4 3 4 3 3 3 4 4 3 3 4 4 4 2 2 2 5 2 2 4 1 4 4 4 4 4 4 2 2 4 2 2 2 2 4 4 4 4 2 5 2 4 4 4 4 4 2
4 5 3 4 4 211 2 4 5 7 4 4 4 4 4 4 4 4 3 3 4 3 4 4 3 3 4 4 3 3 3 3 5 2 2 3 4 3 2 4 2 4 4 4 4 4 4 4 2 4 2 2 2 2
4 4 4 4 2 4 2 4 4 4 4 5 2 4 4 4 4 3 214 2 4 5 7 2 2 3 3 2 4 4 2 3 2 4 3 4 3 3 2 4 2 2 2 3 2 5 3 4 4 2 2 2 4 3
4 2 4 4 2 2 2 4 2 4 2 2 4 2 2 3 4 2 4 2 4 2 3 4 4 3 2 4 4 3 3 183 2 4 5 8 2 2 2 3 3 4 4 2 3 3 4 3 4 3 3 3 4 3
2 3 3 3 4 3 4 3 4 2 4 4 2 3 3 2 4 4 4 2 4 2 4 4 2 4 4 2 2 2 2 4 2 4 4 2 3 4 2 2 4 3 3 2 189 2 4 5 8 4 4 4 4 4
4 5 3 4 4 5 4 4 4 4 4 4 4 3 3 3 4 5 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 2 2 2 4 4 2 2 4 4 4 2 4 2 2 4 4 4 4 2 3 4 3 4
3 226 2 4 5 8 4 4 4 4 4 4 4 5 3 4 4 5 4 4 4 4 4 4 4 3 3 3 4 5 4 4 4 4 4 4 4 4 4 4 4 3 4 4 4 3 4 3 3 3 2 3 4 4 4 3
3 4 3 4 4 4 4 4 4 2 4 3 4 4 4 233 2 4 5 8 4 4 4 4 4 4 5 4 4 5 5 4 5 5 4 4 4 5 4 4 4 4 5 4 4 4 5 2 4 5 5 4 5 4 4
2 4 4 4 4 4 4 4 2 4 5 4 4 4 2 4 4 4 4 4 3 4 3 5 3 4 4 4 250 2 4 5 9 4 4 4 4 4 4 5 4 4 5 5 4 5 5 4 4 4 5 4 4 4 4
5 4 4 4 5 4 4 5 5 4 5 4 4 2 4 4 4 4 4 4 4 2 4 5 4 4 4 2 4 4 4 4 4 4 4 4 2 5 2 4 4 4 251 2 4 5 9 4 4 4 4 4 4 5 3 4
4 5 4 4 4 4 4 4 4 3 3 3 4 5 4 4 4 4 4 4 4 4 4 4 4 3 4 4 4 3 4 3 3 3 2 3 4 4 3 3 3 4 3 3 4 3 3 4 3 4 3 4 4 3 229
2 4 5 9 4 4 4 4 4 4 5 4 4 5 5 4 5 5 4 4 4 5 4 4 4 4 5 4 4 4 5 2 4 5 5 4 5 4 4 2 4 4 4 4 4 4 2 3 5 4 4 3 3 4 3 3
4 3 3 4 3 4 3 3 4 3 243 1 4 6 7 4 4 4 4 4 4 5 3 4 4 5 4 4 4 4 4 4 4 3 3 3 4 5 4 4 4 4 2 2 2 4 4 4 4 4 4 4 4 2 2
2 4 2 4 2 4 4 4 4 2 2 2 4 4 4 4 4 2 4 4 4 4 4 223 1 4 6 7 4 4 4 4 4 4 5 3 4 4 5 4 4 4 4 4 4 4 3 3 3 4 5 3 4 4
2 4 2 2 2 2 4 4 3 4 4 4 3 2 3 3 3 2 3 4 4 3 3 3 2 3 3 4 3 3 2 3 4 3 3 4 212 1 4 6 8 5 5 5 4 4 4 5 4 4 5 5 4 5
5 4 4 4 5 4 4 4 4 5 4 4 4 5 4 4 5 5 4 5 4 4 2 4 4 4 4 4 4 2 4 5 4 4 4 2 4 4 4 4 4 4 4 2 5 2 4 4 4 254 1 4 6 8
5 5 5 4 4 4 5 4 4 5 5 4 5 5 4 4 4 5 4 4 4 4 5 4 4 4 5 4 4 5 5 4 5 4 4 2 4 4 5 4 4 4 2 3 5 4 4 3 2 2 2 4 4 4 3 4
3 5 2 3 4 5 249 1 4 6 8 2 2 2 4 2 4 4 2 3 3 4 2 4 2 3 2 3 4 2 2 2 2 4 2 1 2 4 4 4 4 2 2 2 4 2 4 2 2 4 3 4 2 2
1 4 3 3 2 2 5 2 4 4 4 2 3 3 4 4 4 2 2 178 1 4 5 9 2 2 2 4 2 4 4 2 3 3 4 2 4 2 3 2 3 4 2 2 2 2 4 1 2 2 4 2 2 4
2 2 2 3 3 4 2 2 4 3 4 3 3 1 5 3 3 2 2 5 3 4 3 3 3 3 3 4 4 2 3 2 176 1 4 5 9 3 3 3 4 2 4 4 3 3 4 4 3 4 4 3 3 4
4 3 3 3 2 4 3 2 2 4 3 2 4 4 4 4 2 4 2 4 3 4 2 4 4 2 3 3 4 3 4 2 4 2 4 4 4 4 4 2 4 3 4 4 3 205 1 4 5 9 3 3 3 4
2 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 3 3 2 3 2 3 4 3 3 2 2 3 4 3 3 3 3 2 3 3 3 2 3 4 3 3 2 4 3 3 3 3 4 3 4 3 3
3 3 193 1 4 5 9 3 3 3 4 2 4 4 3 3 4 4 3 4 4 3 3 4 4 3 3 3 3 4 3 3 2 4 3 2 4 4 3 4 3 4 4 4 3 3 3 2 4 3 1 3 3 3 3
4 2 3 3 3 4 3 4 4 3 3 3 4 4 3 202 1 4 5 9 5 5 5 4 4 4 5 4 4 5 5 4 5 5 4 4 4 5 4 4 4 4 5 4 4 4 5 4 4 5 5 4 5 4
4 2 4 4 5 4 4 4 2 3 5 4 4 3 3 4 4 4 4 4 3 4 3 4 3 4 5 4 255 2 4 5 8 4 4 4 4 4 4 5 3 4 4 5 4 4 4 4 4 4 4 3 3 3
4 5 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 2 4 4 4 4 4 2 4 4 4 4 4 4 4 4 2 4 4 4 4 4 3 240 1 4 6 9 4 4 4 4 4 4 5 3
4 4 5 4 4 4 4 4 4 4 3 3 3 4 5 4 4 4 4 4 4 4 4 4 4 4 4 3 4 4 4 4 4 4 4 4 4 2 3 4 4 4 3 2 4 3 4 4 4 4 4 2 4 4 4 4 4
237 2 4 6 9 4 4 4 4 4 4 5 3 4 4 5 4 4 4 4 4 4 4 3 3 3 4 5 4 4 4 4 4 4 4 4 4 4 4 3 4 4 4 4 4 4 4 4 2 3 4 4 4 3 2
4 3 4 4 4 4 4 2 4 4 4 4 3 236 2 4 5 9 5 5 5 4 4 4 5 4 4 5 5 4 5 5 4 4 4 5 4 4 4 4 5 4 4 4 5 4 4 5 1 4 5 4 4 2
4 4 5 4 4 4 2 4 5 4 4 4 2 2 2 4 4 4 4 4 4 1 2 4 5 4 4 246 2 4 5 8 2 2 2 4 2 4 4 2 3 3 4 2 4 2 3 2 3 4 2 2 2 2 4
1 2 2 4 2 2 4 4 2 4 3 4 2 2 2 3 2 2 2 1 2 3 3 2 4 1 4 2 4 4 2 3 4 1 4 4 2 4 2 169 2 4 5 9 5 5 5 4 4 4 5 4 4 5
5 4 5 5 4 4 4 5 4 4 4 4 5 4 4 4 5 4 4 5 1 4 5 4 4 2 4 4 5 4 2 2 2 2 5 4 4 4 2 4 4 4 4 4 3 4 3 4 3 4 5 4 246 2
4 5 9 2 2 2 4 2 4 4 2 3 3 4 2 4 2 3 2 3 4 2 2 2 3 4 1 2 2 4 2 2 4 4 2 3 2 3 2 2 2 3 2 3 3 1 1 2 4 2 4 2 3 3 3 3
3 3 3 2 3 4 2 3 2 166 2 4 5 9 3 3 3 4 2 4 4 3 3 4 4 3 4 4 3 3 4 4 3 3 3 4 3 2 2 2 2 3 2 2 2 4 3 3 4 4 4 3 3 2

4 2 2 1 4 4 3 3 2 4 2 4 4 4 4 4 2 4 4 4 4 4 198 2 4 6 8 3 3 3 4 2 4 4 3 3 4 4 3 4 4 3 4 3 4 4 3 3 3 2 2 3 2 4
4 4 3 2 2 3 4 3 3 3 3 3 2 3 3 4 2 3 3 4 2 3 4 3 3 3 3 2 3 3 3 3 3 3 3 193 2 4 6 8 2 2 2 4 2 4 4 2 3 3 4 2 4 2
3 2 3 4 2 2 2 2 4 1 2 2 4 2 2 4 4 2 4 3 4 2 2 2 3 2 2 2 1 2 3 3 2 4 1 4 2 4 4 2 3 4 1 4 4 4 2 2 169 1 4 5 9 3
3 3 4 2 4 4 3 3 4 4 3 4 4 3 3 4 4 3 3 3 2 4 3 2 2 4 2 3 4 4 4 4 3 3 3 3 3 4 3 3 3 2 3 3 3 4 3 2 3 3 3 3 3 3 3
3 3 3 3 3 196 1 4 6 8 5 5 5 4 4 4 4 5 4 4 5 5 4 5 5 4 4 4 5 4 4 4 4 1 4 4 2 5 2 2 1 5 4 5 4 4 2 4 2 5 2 4 4 2
2 5 4 4 2 4 2 2 4 4 4 4 2 4 5 2 4 4 231 2 4 5 9 4 4 4 4 4 4 5 3 4 4 5 4 4 4 4 4 4 4 3 3 3 4 5 4 4 4 4 4 4 4 4
4 4 3 4 4 4 4 4 4 4 4 2 3 4 4 4 3 2 4 3 4 4 4 4 4 2 4 4 4 4 4 237 2 4 6 8 3 3 3 4 2 4 4 3 3 4 4 3 4 4 3 3 4 4
3 3 3 3 4 2 2 3 3 4 3 4 2 2 4 4 2 4 4 4 3 3 4 4 2 1 4 4 3 3 2 4 2 4 4 4 4 4 2 4 4 4 4 2 204 2 3 6 9 4 3 4 4 3
4 4 2 4 5 4 3 4 4 4 3 4 4 3 3 4 4 4 2 4 4 4 4 2 4 4 4 4 3 4 4 4 4 4 3 3 3 2 4 4 3 4 4 2 4 4 4 4 4 4 4 4 4 2 4 4
4 226 2 4 5 8 4 4 4 2 2 4 4 2 2 4 4 2 4 2 2 2 4 4 2 2 2 2 4 2 2 2 4 4 2 2 4 4 4 4 4 4 4 2 2 4 2 2 2 2 4 2 2 4
2 4 2 4 4 2 2 2 2 4 4 2 2 4 182 2 4 6 8 2 2 2 4 2 4 4 3 3 2 4 2 4 4 3 4 4 2 2 2 4 2 4 2 1 4 4 3 2 4 4 4 4 4 4
4 4 4 4 2 2 1 2 2 4 4 3 4 1 4 2 4 4 4 2 4 2 4 4 4 4 4 196 2 4 6 7 3 3 4 4 3 4 4 4 4 4 4 3 4 4 4 4 4 4 4 4 4 4
4 2 2 4 4 4 4 4 3 4 4 4 4 4 4 4 2 4 2 4 2 4 4 4 4 4 2 4 2 4 4 4 4 4 2 4 2 3 4 4 224 2 4 5 8 4 4 3 4 2 4 4 4 2
2 4 3 4 2 2 2 3 3 2 2 2 2 3 4 5 2 3 3 4 4 5 3 4 1 5 3 5 2 4 3 3 3 3 3 3 3 4 1 4 2 4 5 3 4 4 2 4 3 2 4 4 198
2 4 6 8 1 2 4 4 4 4 4 4 4 2 4 4 4 4 3 4 4 4 4 4 4 4 4 4 2 4 4 4 4 4 4 4 5 2 4 4 4 2 4 4 3 3 4 4 4 3 4 2 4 4 4 4
4 4 4 4 2 4 2 4 4 2 224 2 4 6 8 3 3 3 3 4 4 4 3 3 4 5 4 4 4 4 4 4 4 4 3 4 2 4 4 4 2 4 4 4 2 4 2 3 4 2 4 2 4 4 4
3 3 3 2 2 3 3 3 4 2 4 3 4 4 3 3 3 2 4 3 3 4 4 209

APPENDIX- VI CERTIFICATE OF SEMINAR PARTICIPATION



SCHOLAR'S MOSAIC 2021
ANNUAL YOUNG RESEARCHERS' MEET JULY 17-19, 2021
ORGANIZED BY RESEARCH CELL
DEPARTMENT OF EDUCATION (CASE, IASE & IUCTE)
FACULTY OF EDUCATION AND PSYCHOLOGY
THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA, VADODARA, GUJARAT- 390002

CERTIFICATE OF APPRECIATION

This is to certify that

MISS SILE HAIKAM

from **Teacher Education**

has presented a paper entitled **Usage and Awareness of Information and Communication Technology (ICT) among the B.Ed. Students with reference to Kohima, Nagaland** in the Researchers' Mosaic, 2021 organized by the Research Cell, Department of Education, Faculty of Education and Psychology, The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat from 17th to 19th July, 2021.

Prof. Ashutosh Biswal
Coordinator, Scholars' Mosaic 2021
The Maharaja Sayajirao University of Baroda

Prof. R. C. Patel
Dean, Faculty of Education and Psychology
The Maharaja Sayajirao University of Baroda