METACOGNITIVE ABILITY OF SECONDARY SCHOOL STUDENTS IN RELATION TO USAGE OF MOBILE PHONE IN DIMAPUR DISTRICT

A Dissertation submitted on partial fulfillment of the requirement for the award of the degree of Master of Philosophy (M.Phil) in Education

Submitted by

I.AZUNGLA IMSONG

Roll no.05/2021

Registration no.89/2022

Under the supervision of

Dr Rashmi

Assistant Professor

Department of Teacher Education

Nagaland University

DEPARTMENT OF TEACHER EDUCATION

NAGALAND UNIVERSITY

KOHIMA CAMPUS, MERIEMA, NAGALAND-797004

OCTOBER, 2023

ACKNOWLEDGEMENT

First, I would like to thank the Almighty God for his blessings, enduring grace, guidance, and protection bestowed upon me during the research project.

It is my humble pleasure to express my sincere gratitude to my supervisor, Dr. Rashmi, Assistant professor, for her immense knowledge and expertise. Her unwavering support, patience, and guidance helped me complete my thesis.

I thank Dr. Pradipta Kumar Pattnaik (HoD), all the teaching faculty members, and non-teaching staff in the Department of Teacher Education for their valuable and timely suggestions, encouragement, and constant support.

I would like to acknowledge and thank the Principal, Administrator, and teaching faculty and non-teaching staff of Unity College, Dimapur for the endless amount of support, love and encouragement through this journey.

I sincerely appreciate and thank all the schools that I have visited in Dimapur District for your humble permission, open-mindedness, and cooperation in equipping data for my study. I thank all the students of the schools who has participated and produced their data without which my thesis could have never completed.

I want to thank my fellow research scholars for their encouragement and support.
A special thanks to my family, relatives, and friends for endless prayers, continuous encouragement and support throughout this academic journey.

Lastly, thanks goes to all those who have supported me in completing the research work directly or directly.

Place:
Date:

I. Azungla Imsong
Roll no. 05/2021
Registration no. 89/2022
M.Phil Research Scholar

DECLARATION

I, I.AZUNGLA IMSONG, hereby declare that the dissertation entitled 'Metacognitive Ability of Secondary School Students in relation to Usage of Mobile Phone in Dimapur District' is a bonafide record of independent research work done by me under the supervision of Dr.Rashmi, Assistant Professor and submitted to Nagaland University, Kohima Campus, Meriema for the award of Master of Philosophy in Education (M.Phil). 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.

Place : Kohima

Dated :

I.AZUNGLA IMSONG

Roll No. 05/2021

Registration No.89/2022

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- 797004

PLAGIARISM CERTIFICATE

M.Phil. Dissertation Certificate on Plagiarism Check

Topic: Metacognitive Ability of Secondary School Students in relation to Usage of Mobile Phone in Dimapur District'

Name of the Research Scholar	I.AZUNGLA IMSONG
Roll no	05/2021
Reg.No	89/2022
Name of the Supervisor	Dr. Rashmi
Name of the Department	Department of Teacher Education, NU
Date of Submission	29/09/2023
Date of Plagiarism Check	29/09/2023
Percentage of similarity detected by the URKUND Software	0 %

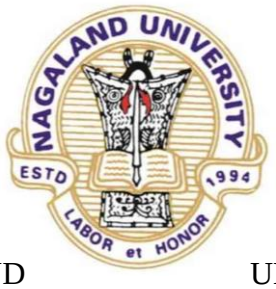
I hereby declare that the M.Phil. Dissertation submitted by me is complete in all respects as per the guidelines of Nagaland University (NU) on partial fulfilment of the requirement for M.Phil Degree. I also certify that the dissertation (soft copy) has been checked for plagiarism using **URKUND** similarity check software. It is also certified that the contents of the electronic versions of the dissertation are the same hard copy of the dissertation. A copy of the report generated by **URKUND** software is also enclosed.

Place:

Date:

I.AZUNGLA IMSONG
Reg. No. 89/2022
M.Phil. Research Scholar

Dr. RASHMI
(Supervisor)
Assistant 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 797004

CERTIFICATE

This is to certify that I.AZUNGLA IMSONG, Reg. No. 89/2022 M.Phil Research Scholar of Teacher Education Department, Nagaland University, Kohima Campus Meriema, has worked under my supervision. Her study entitled "METACOGNITIVE ABILITY OF SECONDARY SCHOOL STUDENTS IN RELATION TO USAGE OF MOBILE PHONE IN DIMAPUR DISTRICT" 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 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.

Place:

Date:

Dr. RASHMI

(Supervisor)

Assistant Professor

Department of Teacher Education

Nagaland University, Kohima Campus, Meriema

LIST OF FIGURES

LIST OF TABLES

CONTENTS

CHAPTER-II: REVIEW OF LITERATURE

CHAPTER-III: METHODOLOGY

CHAPTER-IV: ANALYSIS AND INTREPRETATION OF THE DATA

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

CHAPTER-1 INTRODUCTION

CHAPTER-1 INTRODUCTION

CHAPTER -1

INTRODUCTION

1.1 CONCEPTUAL BACKGROUND

Metacognition has been widely accepted in psychology and is essential in learning. According to Flavell, 'Metacognition is an individual's knowledge of their cognitive processes and ability to control them by organizing, monitoring and modifying them as a function of learning.' "Metacognition refers to knowledge concerning one's cognitive processes or anything related." It will enable an individual to understand themselves and develop new skills. Individuals can revise their learning experience daily to evaluate the outcome. Metacognitive activities include planning, approaching a given learning task, monitoring comprehension, and assessing progress toward completing a task. Cognitive strategies promote learning and task completion, whereas Metacognitive strategies monitor the process.

Now, owning and using mobile phones has become integral to our lives. We use a mobile or smart phone for sending text messages, communicating with others, sharing various information, using social media, and for educational purposes. On the contrary to its utility, Davey and Davey (2014) stated that mobile phone addiction is considered one of the forms of compulsive use of "a mobile phone" by adolescents worldwide. A new kind of health disorder in this category among adolescents, smartphone addiction/misuse, is now considered challenging health policymakers globally to think about this rapidly emerging issue. It has become a global issue, especially amongst the youngsters. Many people connect to the internet and social media from their mobile phones. Students are also connected to the internet via mobile phones in their extracurricular time and courses. While using mobile phones for educational purposes is encouraged by a lot of research, most students use them for leisure as entertainment. This phenomenon, which turns to addiction after a specific period, adversely affects the students' academic performance. An alternate way of solving this can be to divert the usage of mobile phones in learning activities and raise awareness of the defects of overusing mobile phones.

It has been revealed that mobile smartphones have been increasing among school students in Manokwari but have yet to be used well in learning (Damopoli & Kurniadi, 2019). Metacognitive awareness is essential for successful learning because it enables students to manage their cognitive skills better, perform better than unaware learners, and be more strategic in constructing new cognitive skills. Sonowal and Kalita (2019) revealed a positive correlation between metacognitive awareness and academic achievement. One of the studies by Sudiatama et al. (2023) mentioned the efficacy of mobile-assisted language approval in improving students' reading skills in the teaching-learning process. So, the teacher can design learning that integrates the use of mobile smartphones as mobile learning and can used in terms of positive outcomes in education. Borkowski and Muthukrishna (1992) have argued that metacognitive theory has considerable potential for aiding teachers in their efforts to construct classroom environments that focus on flexible and creative strategic learning that are advocating the importance of metacognitive activity within educational contexts have resulted in placing metacognition high on the scholarly research field.

Therefore, what needs to be done first by the teacher is to integrate mobile devices in learning in the form of mobile learning and to use them to train students' Metacognitive skills. Developing students' metacognitive ability has become significant in monitoring, awareness, planning, and evaluating their cognitive activities for better academic performance. Metacognition is a complex but valuable skill that can nurture students' learning and their self-awareness of the learning process (Athira & Chacko, 2020). Noushad (2008) also stated that metacognitive strategies are indispensable for the twenty-first century because they may encourage students to successfully cope with new situations and the challenges of lifelong learning. Consequently, metacognitive awareness can benefit young students by purposefully applying learning strategies, developing effective habits, and assessing their performance in the learning process.

1.2 BACKGROUND OF NAGALAND

The official state portal, the Government of Nagaland, has mentioned that on 1 December 1963, Nagaland became a fully-fledged state, the 16th State of India. At the time of the formation of Nagaland State, there were three districts, namely Kohima, Mokokchung, and Tuensang. Assam bounds it in the West, Myanmar (Burma) on the east, Arunachal Pradesh and part of Assam on the North, and Manipur in the South. The

State consists of 16 (Sixteen) Administrative Districts inhabited by 17 major tribes and other sub-tribes. The major tribes are Angami 2. Ao 3. Chakhesang 4. Chang 5. Khiamniungan 6. Kuki 7. Konyak 8. Kachari 9. Lotha 10. Phom 11. Pochury 12. Rengma 13. Sumi 14. Sangtam 15. Tikhir 16. Yimkhiung 17. Zeliang. Each tribe is distinct in terms of customs, language, and dress. Nagaland is considered a land of festivals. Most of these festivals revolve around agriculture, the main-stay of Naga society. Over 85% of the population of Nagaland is directly dependent on agriculture. All the tribes celebrate their different festivals with pageantry of color and a feast of music. English has become the State language, while Nagamese has become the common lingua for inhabitants of Nagaland (source: https://nagaland.gov.in/).

Figure 1.1 Map of Nagaland

▲ Indicates Map of Dimapur district

1.2.1 BACKGROUND OF DIMAPUR DISTRICT

In Nagaland, Dimapur district was inaugurated as the eighth district of Nagaland in December 1997 through a Government of Nagaland, Home Department notification no. GAB-5/29/78(pt) dated 02-12-1997 (Government of Nagaland, District Dimapur, n.d.). Besides being referred to as a gateway of Nagaland and Manipur, the main commercial activities of the State revolved around Dimapur, the District headquarters. On 18th

December 2021, Niuland and Chumukedima districts were carved out of Dimapur district, becoming Nagaland's 14th and 15th districts, respectively. According to the 2011 census, the Schedule Tribe population of the district and its percentage of the total population is 59.1% (223989).The Position of the District in terms of literacy rate is 5th place (84.8 %) in Nagaland (Government of Nagaland, District Dimapur, n.d.). The only railhead and airport of the State is located in Dimapur, the district headquarters. The National Highway 29 connects the State capital, Kohima, and the neighboring States of Manipur, Tripura, and Mizoram. Dimapur city, the district headquarters, is distinct; all the different communities have congregated, portraying a mini India.

1.3 BACKGROUND OF SECONDARY SCHOOL IN NAGALAND

Secondary education is an important part of the Indian education system. It is the bridge that connects primary education with higher education and world of work. At present as per the NEP1986, 10+2+3 structures are implemented in most of the state in India. Regarding the further break-up of the first 10 years, elementary system comprising 5 years (class 1-5) of primary education and 3 years (class 6-8) of upper primary, followed by 2 years (class 9 & 10) of High School.

National Education Policy 2020 (NEP) envisions a massive transformation in education, making India a global knowledge superpower. The NEP 2020 is founded on the five guiding pillars of Access, Equity, Quality, Affordability, and Accountability. In school education, the National Education Policy 2020 stresses the core values and principle that education must develop cognitive skills and social and emotional skills. The Policy aims and aspires to universalize pre-primary education with particular emphasis on attaining foundational literacy/numeracy in primary school and beyond by 2025. It recommends a plethora of reforms at all levels of school education which seek to ensure the quality of schools, transformation of the curriculum including pedagogy with 5+3+3+4 design covering children in the age group 3-18 years, reform in the current exams and assessment system, strengthening of teacher training, and restructuring the education regulatory framework. It seeks to increase public investment in education, enhance the use of technology, and increase focus on vocational and adult education, among others. It recommends that the curriculum load in each subject should be reduced to its ‘core essential’ content by making space for holistic, discussion, and analysis-based learning (Ministry of Education, Government of India).

In Nagaland, schools are run by the state, central government, or private organizations. The overall literacy rate of Nagaland is 80.1 percent. Nagaland Board of School Education (NBSE) covers the state's secondary and higher secondary education. The NBSE was set up through an Act passed by the Nagaland Legislative Assembly. Functioning from the 1st October 1974, the Board held its first High School Leaving Certificate Examination, at 6 (six) centers, in March 1975. After two decades in 1990, an Amendment in the Act empowered the Board to conduct the higher secondary school leaving certificate examination under the three streams of science, arts and commerce. Nagaland Board of Secondary Education (NBSE) is managed and run by private and government, a state-level board of education. The Board prepares the curriculum & syllabus and prescribes textbooks for secondary and higher secondary and conducts the examinations. It organizes teachers development programmes and conducts workshops, seminars and training of teachers on matters related to academic and examination issues. For the past 3 years, the Board have been carrying out in–service teachers training under RMSA programme. Under Dimapur district, there are 186 Secondary schools affiliated to NBSE board run by both Government and Private Management (NBSE).

The Central Board of Secondary Education (CBSE) is also managed and run by private and government, a national-level board of education. Under Dimapur district, there are 12 schools affiliated to CBSE board run by both Government and Private Management. The Central government of the country holds control of CBSE. Over 20,000 schools under CBSE in India aim to provide excellent education to the future generation on its motto “Committed to Equity and Excellence to Education”. The curriculum provided by CBSE is based on National Curriculum Framework-2005 and seeks to provide opportunities for students to achieve excellence in learning. To ensure education for all, government schools under CBSE are also offering free education to students of economically weaker sections (Government of India, Central Board of School Education).

GLIMPSE OF NUMBER OF SCHOOLS OF NBSE AND CBSE RUN IN NAGALAND (TABLE NO. 1.1 AND 1.2)

Table No. 1.1: Number of NBSE schools in Nagaland 2022 (District and category-wise)

Sl. no	District	Government Higher Secondary Schools	Government High schools	Private Higher secondary schools	Recognized Private high schools	Permitted school	Total
1	KOHIMA	8	16	30	18	19	91
2	MOKOKCHUNG	5	37	13	11	5	71
3	TUENSANG	4	23	2	5	14	48
4	MON	6	17	5	2	32	62
5	PHEK	4	35	6	12	4	61
6	WOKHA	4	21	4	7	14	50
7	ZUNHEBOTO	5	21	5	14	12	57
8	***DIMAPUR**	**7**	**25**	**53**	**14**	**87**	**186**
9	KIPHIRI	2	15	1	2	10	30
10	LONGLENG	1	15	-	3	5	24
11	PEREN	4	16	7	3	8	38
12	NOKLAK	1	4	-	1	2	8
13	CHUMKEDIMA						
14	NUILAND						
15	TSEMINYU	1	6	1	2	2	12
16	SHAMATOR						
	TOTAL	52	251	127	94	214	738

Source: https://nbsenl.edu.in/general-information

Table no. 1.2.: Number of CBSE schools in Nagaland 2023 (District and category-wise)

Sl. no	District	Government	Private	Total
1	KOHIMA	4	1	5
2	MOKOKCHUNG	4	1	5
3	TUENSANG	1	-	1
4	MON	2	-	2
5	PHEK	2	-	2
6	WOKHA	2	-	2
7	ZUNHEBOTO	4	-	4
8	***DIMAPUR**	**6**	**6**	**12**
9	CHUMUKEDIMA	1	5	6
10	NUILAND	1	-	1
9	KIPHIRI	1	-	1
10	LONGLENG	1	-	1
11	PEREN	3	-	3
12	NOKLAK	-	-	-
15	TSEMINYU	-	-	-
16	SHAMATOR	-	-	-
	TOTAL	32	13	45

Source: https://cbseit.in/cbse/cbse_maps/udiselocatecbse

1.4 CONCEPT OF METACOGNITION

Metacognition is derived from the Greek root word "meta" meaning "beyond" and the Latin word "Cognoscere" meaning "getting to know" refers to a student's ability to be aware of what they are thinking about and choose a helpful thought process. It captures a student's ability to analyze how they think; Have high self-awareness and control of their thoughts, and chooses an appropriate and helpful strategy for the task at hand. The American Psychological Association defines Metacognition as "awareness of one's own cognitive processes, often involving a conscious attempt to control them."

DEFINITIONS OF METACOGNITION

Flavell, 1976 defined metacognition as "remembering to remember, and then monitoring and updating knowledge" (Noushad, 2008).

Flavell, 1979 has defined metacognition as ''thinking about thinking' or 'cognition about cognition' (Noushad, 2008).

Schraw and Dennison, 1994 defined metacognition as the ability to reflect upon, understand, and control one's learning" (Salari, 2013).

CHARACTERISTICS OF METACOGNITION

Niwlikar (2022) has mentioned the following characteristics are identified:

i) Metacognition is intentional in nature. It begins before cognition takes place.

ii) It is both conscious as well as unconscious. Although Flavell understood it as a conscious activity of human cognition, but later on some researchers discovered that it could take place in unconscious stage of human mind.

iii) It is purposeful and foresighted. Metacognitive activity begins in the human mind with the purpose of learning.

iv) It is directed towards achieving a learning outcome.

vi) Metacognition can take place while learning both cognitive and affective learning tasks.

vii) It also involves active monitoring and self-regulation. Hence, learner continuously monitors his/her progress through the learning task.

Metacognition is one of the buzzwords in educational psychology. Livingston (2003) mentioned that Metacognition refers to higher-order thinking that involves active control over the cognitive processes engaged in learning. Metacognition plays a critical role in successful education; studying metacognitive activity and development is essential to determine how students can apply their cognitive resources through metacognitive control. It stated that metacognitive theory is a theory of knowledge interested in how humans can actively monitor and regulate their thought processes. The metacognitive theory is widely prevalent among educational and developmental psychologists. It can effectively explain how people regulate their thinking to develop their efficiency in learning.

Despite its popularity, it criticized that it's unclear whether meta-thought is entirely conscious or unconscious. Flavell argued that it could be both conscious and unconscious, whereas others believe it is only a deliberate process. The American Psychological Association defines Metacognition as "awareness of one's cognitive processes, often involving a conscious attempt to control them" (Niwlikar,2022). Educational institutions encourage their teachers to use appropriate pedagogical skills to promote metacognitive abilities in the learners. This notion was evident in the works of Jean Piaget, who worked on human cognition. In addition, Lev Vygotsky's also worked on social constructivism. John Flavell was the first psychologist who coined the term 'metacognition' in 1976 (Niwlikar,2022). Flavell refer metacognition as knowledge as concerning one's cognitive processes or anything related. Broadly, it refers to "cognition about cognition or knowing about knowing" He was also greatly influenced by the works of Piaget on human cognition. Further, he says: "A metacognitive approach instruction can help students learn to take control of their learning by defining learning goals and monitoring their progress in achieving them."

Flavell (1976) also identified three “metas” that children gradually acquire in the context of information storage and retrieval. These were: (a) The child learns to identify situations in which intentional, conscious storage of certain information may be useful at some time in the future; (b) the child learns to keep current any information which may be related to active problem-solving, and have it ready to retrieve as needed; and (c) the child learns how to make deliberate systematic searches for information which may be helpful in solving a problem, even when the need for it has not been foreseen (Flavell, n.d.).

Flavell used the term metamemory concerning an individual's ability to manage and monitor the input, storage, search, and retrieval of the contents of his memory. Later he stated that Metacognition is intentional, conscious, foresighted, purposeful, and directed at accomplishing a goal (Flavell & Wellman, 1975). Flavell work acknowledged the explosion of interest and work in areas related to metacognition, such as oral communication skills, persuasion and comprehension, reading, writing, language acquisition, memory, attention, problem-solving, social cognition, affective monitoring, and self-instruction. Developing metacognitive skills in childhood. Drew (2023) has mentioned that Flavell identified three stages of Metacognition in early childhood:

Stage 1: Storage. Young children intentionally and consciously use basic strategies such as repetition and focus on ensuring information is store in their minds for future use.

Stage 2: Recall. Children learn strategies that help them store information in their working memory to recall it shortly. They can remember information when they predict it will be helpful, such as in a game of 'memory.'

Stage 3: Systematic Strategies. Children use systematic strategies to recall information even when they do not predict it will be required. They use active recall strategies such as self-questioning, thinking aloud, and mnemonic aids so they can recall the information from longer-term memory.

In 1979, Flavell proposed four different classes of Metacognition. These categories form a framework for the theory (Drew, 2023):

1. Metacognitive knowledge: Metacognitive knowledge (MK) is a person's beliefs about how they can affect cognition. A person who believes they can control their cognitive processes may be understood to have an 'internal locus of control.' This person is likely more motivated to try to control their thought processes than someone who does not believe in their ability to control their thoughts. People who do not think they can control their cognitive processes have an 'external locus of control,' meaning they believe control over their thinking is outside their grasp.

2. Metacognitive experiences: Metacognitive experiences (ME) are a person's own 'in the moment' subjective applications of their meta-thinking to achieve tasks. Flavell suggested that this is a "stream of consciousness" process. Examples include connecting one current event to a past event. Provide personal feedback throughout a task to ensure you use the right thought processes to succeed. It differs from metacognitive knowledge because your experiences are how you apply meta strategies, while knowledge is your awareness of your ability to control your cognition.

3. Tasks or goals: Your tasks or goals are the outcomes you want to achieve when thinking about your thinking. Examples include Comprehension, Memorization, Creating something, solving a problem, writing a paragraph, and improving your knowledge. You use your goals to shape which cognitive strategies you plan to use to achieve success.

4. **Strategies or activities.** 'Metacognitive strategies' are all you can use to achieve your cognitive goals. These can include:

●**Self-questioning (internal talk):** The ability to ask yourself questions throughout your work to ensure you do it to the best of your ability.

●**Meditation:** By pausing and clearing your mind, you can flush out all the extra chatter and focus more on the task.

●**Reflection:** As you work, reflect on what you're doing and think about ways to do it better. Awareness of Learning Styles: Knowing which learning methods best suit your skills. Learning styles are known as 'learning modalities' and include verbal, aural, kinesthetic, and tactile.

●**Use of Mnemonic Aids:** Using rhymes, patterns, and associations to remember things. For example, when you meet someone new, you bank the knowledge in your mind by cognitively linking that person to another person with the same name

Metacognitive theory has significantly contributed to psychology and education by enhancing our understanding of how individuals think about and regulate their cognitive processes. It allows individuals to understand their thought processes better, make adjustments when necessary, and help them develop effective learning strategies. By understanding their strengths and weaknesses in learning, individuals can employ plans tailored to their needs. It also aids in recognizing and correcting cognitive biases and errors in judgment. Metacognitive strategies have been linked to improved academic performance. Students taught to use metacognitive techniques tend to perform better in exams, retain information longer, and exhibit a deeper understanding of the material. The metacognitive theory has given an account of how individuals think, learn, and regulate their cognitive processes, which positively impact learning, problem-solving, and decision-making in practical applications in education, psychology, and other fields.

1.5 BACKGROUND OF MOBILE PHONE

Technically Mobile phone has been term as a wireless handheld device that allows users to make and receive calls. While the earliest generation of mobile phones could only make and receive calls, today's mobile phones do a lot more, accommodating web browsers, games, cameras, video players and navigational systems. We depend on mobile phones to communicate with each other and access the ever-changing educational resources online. India had 1.2 billion mobile subscribers in 2021, of which

about 750 million are Smartphone users. It is poised to be the second-largest Smartphone manufacturer in the next five years.

Mobile phone has been become very important in one's life. Mobile learning has also emerged as a new technological achievement and educational trend that provides both educators and learners with ample opportunities (Ilci, 2014). People use social networking sites or applications due to the expectation of certain gratifications. The person using the technology finds at least partial gratification after usage. For example, using the application to chat with friends or to find new information (Bhatnagar & Sabharwal, 2021).Wilmer et al. (2017) in their study found that the research concerning the potential cognitive impacts of smartphone technology is growing, the results remain contradictory and inconclusive. Contradictory findings suggest that not all smartphones use is created equal; certain apps, approaches to multitasking, or notification settings may moderate the relation between overall smartphone use and various cognitive skills. It mentioned that media headlines encourage a public perception that the findings are conclusive and that smartphones have a definite and negative impact on cognitive functioning.

IMPACT OF USAGE OF MOBILE PHONE

Technology has made our life easy and accessible. We use mobile phones to communicate, inform and entertain, and also as companions. Gadgets, like mobile phones, are a boon for human beings; on the other side are the bane of our lives. It makes us inactive but also harms our physical and mental well-being. Most of the time, we see children spending leisure time on their phones, scrolling through social media, and instead doing productive work or any outdoor activities. Children, especially, have become victims of smartphones, and if we don't take steps soon, these smart gadgets will ultimately ruin their lives. Nomophobia is an abbreviated form of "no-mobile-phone phobia." The term was first coined in a 2008 study that was commissioned by the UK Postal Office. In a sample of more than 2,100 adults, the study indicated that 53% of participants experienced nomophobia. The condition is characterized by feelings of anxiety when people lose their phones, run out of battery life, or have no cellular coverage (Cherry, 2023).

Through smartphones, students can explore new things rather than going through whole books to find the desired information within a limited time frame. Moreover, they can access any book or educational site within seconds and at any time. Students can also use websites to acquire study material and applications that assist them with their assignments or homework. For example, students can benefit from the online learning material to enhance learning outcomes. It has become a must for students who are studying in schools to have mobile phones nowadays because of the new world pandemic, as their academic curricula are to be started or continued online, not everyone can afford a laptop or a computer, so a mobile being a cheaper alternative takes the space for the computer in the online lecture. Students have an advantage when they have the convenience of a mobile device, not just for online courses. They can also use it for entertainment, like movies, games, social media, etc. Due to the increase in mobile phone users in the younger generation, companies have started to develop their portable version as a more user-friendly application that lets people stick to the app longer, increasing the media used by the students. The mobile phone is beneficial for young students looking to get an education, as the online lectures conducted by schools, colleges, and coaching classes can be quickly attended on the mobile phone. The mobile phone has made learning easy for the masses as it fits in their hands, and students can attend lectures wherever they are located with a good network. With its advantage, there is a negative side to the excessive use of mobile phones, which can act as a barrier to quality interactions, conversations, and student health-related issues. Mobile devices are portable electronic devices designed for communication, entertainment, productivity, and other purposes. Mobile devices have been characterized by their ability to connect to wireless networks, such as cellular networks or Wi-Fi, allowing users to access the internet and communicate with others from virtually anywhere. Mobile devices like smartphones have revolutionized how people communicate, access information, and conduct business. Mobile devices have become an integral part of modern life, providing convenience and connectivity for personal and professional purposes. However, while there are many advantages to mobile devices, several disadvantages must be considered.

SMART PHONE: ITS ADVANTAGES AND DISADVANTAGES

Mobile devices like smartphones have changed how people communicate, access information, and conduct business. There are many advantages and disadvantages of mobile devices.

Advantages of Mobile Devices:

a) Convenience: Mobile devices allow users to access information and communicate with others from anywhere in the world, making it easier to stay connected and get things done efficiently. It offers accessibility features such as screen readers, voice commands, and text-to-speech capabilities to assist individuals with disabilities.

b) Camera and Multimedia: Most modern mobile phones have high-quality cameras, allowing users to capture photos and videos. They can used for video conferencing and multimedia playback.

c) Efficiency: Mobile devices have made it easier for businesses to streamline operations and communicate with customers and employees more efficiently.

d) Entertainment: Mobile devices with internet facilities provide access to a range of entertainment options like music, movies, and games, which can help to reduce stress, improve mood, and engage during their leisure time if used productively and responsibly.

e) Education: Mobile devices provide access to educational resources, such as online courses and educational apps, which can help to improve knowledge and skills and understand the concepts better by referring to different sources of information

Disadvantages of Mobile Devices:

a) Health risks: Overusing mobile devices may lead to physical health issues such as eye strain, neck pain, insomnia, fatigue, and addiction.

b) Distractions: Mobile devices may be a source of distraction, impacting productivity and affecting a student's ability to focus and learn in their studies instead of focusing on other outdoor activities.

c) Social isolation: Mobile devices provide access to communication. They can also contribute to social isolation and reduced face-to-face interactions, negatively impacting their mental health.

d) Risk-taking behavior: Access to the internet and social media can expose young individuals to risky behaviors, such as accessing inappropriate content or participating in dangerous online challenges.

d) Sleep Disruption and Addiction: The blue light emitted by mobile phone screens can interfere with sleep patterns, making it difficult for teenagers to get enough restorative sleep. Some young individual may develop an addiction to their mobile phones, constantly checking for notifications and feeling anxious when separated from their devices.

1.6 AWARENESS OF USAGE OF MOBILE PHONE

Awareness of mobile usage refers to an individual's understanding of how they use their mobile device, including the amount of time spent on it. Being aware of mobile usage for maintaining digital well-being has been considered crucial. It also contains an understanding of mobile device usage's potential benefits and drawbacks. Mobile devices are powerful tools for work and productivity but can also be distracting. Awareness helps individuals identify time-wasting activities and prioritize tasks, improving productivity.

In contrast, excessive mobile device usage, especially on social media, can negatively impact the students' mental health, and excessive screen time can lead to physical health issues like eye strain, sleep disturbances, and addiction, making the students less socially interactive in the social environment. Rekha (2017) mentioned that the average level of awareness of the health hazards of mobile phones is high among the group. Mandal and Mete (2023) found negative aspects of using social media and negatively impact students' research ability and thinking capacity and hamper their writing quality among the students.

Importance of Awareness of usage of mobile phone

Mobile phone can serve as powerful educational tools, and they can access educational apps, e-books, and online resources to supplement their learning, which help them understand complex concepts, improve their research skills, and stay updated with the latest information. They can quickly contact their teachers to ask questions or seek clarification on assignments beneficial for projects and tasks. With the growth of online education after the post-COVID-19 pandemic 19, mobile phones have become essential for accessing virtual classrooms, attending webinars, and participating in online discussions. They allow students to continue their education from anywhere with an internet connection. Mobile phone technology has played a significant function in the development of education in both negative and positive aspects. Overuse of mobile phone can lead to distractions, reduced physical activity, and negative impacts on mental health. Therefore, awareness of mobile phones is crucial, and students need guidance on responsible and mindful use. The parents and educators play a vital role in making them understand the pros and cons, which will impact positively and negatively among the students.

Thus, Mobile phones serve many important functions. Digital literacy is a critical aspect of young people's schooling and research shows mobile phones can play a role in supporting such learning. It is significant that students learn with these devices so they can effectively participate in the workforce in terms of learning activities. Also, these phones provide a link between students and their parents, which has an important role to play in ensuring their safety and making sure that students are responsible enough in using mobile phone.

1.7 SIGNIFICANCE OF THE STUDY

Metacognition has been an area of interest to educational researchers for more than 50 years. A large body of literature exists on this topic, both theoretical and empirical. Metacognition plays an important role in education because it helps learner to be capable to develop a plan, monitor and evaluate how much it is effective, that means Metacognition helps the learner to be more involved in learning process. A lot of studies report that there is difference in the Metacognition of effective learners and ineffective learners. The effective users of metacognition are more strategic. Metacognitive ability varies from person to person.

To the investigator's knowledge, some researches or empirical evidence could be found in the existing literature in India and abroad to understand the relationship between Metacognitive awareness, social competence, study habits, academic achievement, mobile learning and usage of mobile phone. But no studies have examined the Metacognitive ability of secondary school students in relation to usage of mobile phone. Therefore, it becomes an imperative to study Metacognitive ability related to these relevant variables. That is why the present study is designed. With the criteria in mind, the present study was felt to be the need of the hour and was chosen by the researcher to find out Metacognitive ability in relation to the usage of mobile phone.

1.8 STATEMENT OF THE PROBLEM

Many studies revealed the connection between mobile phone usage and the academic success. Research also mentioned that academic success depends upon the metacognitive ability. So, it is become imperative to investigate the relationship between usage of mobile phone and metacognitive ability. The present study is designed to study Metacognitive ability in relation to the usage of mobile phone. The present study is entitled as: ***"Metacognitive Ability of Secondary School Students in Relation to Usage of Mobile Phone in Dimapur district."***

1.9 OPERATIONAL DEFINITIONS

1. Metacognitive ability- Metacognitive ability refers to those abilities such as thinking, reasoning, comprehension, processing speed, attention, memory, visual discrimination which plan, aware, monitor, and evaluate their own cognitive activities independently.

2. Usage of Mobile phone- It refers to the extent to which a person uses a mobile phone.

3. Awareness of Mobile phone-It refers to an individual's consciousness or knowledge about their mobile phone use.

4. Secondary School students- It refers to the students of 9^{th} and 10^{th} standard in both government and private schools in Dimapur district, affiliated to Nagaland Board of School Education (NBSE) and Central Board of school Education (CBSE).

1.10 VARIABLES OF THE STUDY

Following are the dependent and dependent variables for the present study:

1. Dependent variable: Metacognitive ability

2. Independent variable: Usage of mobile phone and awareness of mobile phone.

3. Demographic variables: Gender (Boy and Girl), Type of School Management (Government and Private), Class (9^{th} and 10^{th}), and Board (NBSE and CBSE).

1.11 OBJECTIVES OF THE STUDY

The present study is designed to attain the following objectives:

1. To study the level of metacognitive ability of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class and board.
2. To study the status of usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class and board.
3. To study the status of awareness about the usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class and board.
4. To study the significant influence of usage of mobile phone and awareness of usage of mobile phone on Metacognitive ability for secondary school students in Dimapur district of Nagaland.

1.12 RESEARCH QUESTIONS

For Metacognitive ability

1. What is the level of metacognitive ability of secondary school students in Dimapur district of Nagaland?

Dimension wise Research questions:

1.1 What is the level of knowledge of cognition of secondary school students in Dimapur district of Nagaland?

1.2 What is the level of Regulation of cognition of secondary school students in Dimapur district of Nagaland?

1.3 What is the level of Metacognitive experiences of secondary school students in Dimapur district of Nagaland?

For Usage of Mobile phone

2. What is the status of usage of mobile phone of secondary school students in Dimapur district of Nagaland?

Dimension wise Research questions:

2.1 What is the level of interest in the usage of mobile phone of secondary school students in the Dimapur district of Nagaland?

2.2 What is the status of time spent on the mobile phone of secondary school students in the Dimapur district of Nagaland?

2.3 What is the status of the usage of mobile phone for entertainment purposes of secondary school students in Dimapur district of Nagaland?

2.4 How much time do the students spend on mobile phone daily?

2.5 For what purpose most of the students are using mobile phone?

2.6 At what age did the students open their social media account?

2.7 How much time daily do the students spend on social media?

2.8 What do the students prefer to do in their leisure time?

2.9 Does the students play games on their mobile phone?

2.10 How many mobile games App the students have on their mobile?

2.11 How much time do the students spend daily playing games on mobile phone?

2.12 With whom do the students usually play mobile game?

2.13 For what purpose the students are using YouTube?

2.14 How much time does the students spend daily watching videos/ movies on the mobile phone?

2.15 How often do the students check their mobile phone?

For Awareness of Mobile phone

3. What is the level of awareness about usage of mobile phone of secondary school students in Dimapur district of Nagaland?

Dimension wise Research questions:

3.1 What is the level of awareness of mobile phone usage for the educational purpose of secondary school students in the Dimapur district of Nagaland?

3.2 What is the level of awareness of mobile phone usage in relation to health problems of secondary school students in the Dimapur district of Nagaland?

3.3 What is the level of awareness about age restrictions to use social media of secondary school students in the Dimapur district of Nagaland?

3.4 What health problems do secondary school students face due to excessive mobile phone usage in the Dimapur district of Nagaland?

1.13 NULL HYPOTHESES OF THE STUDY

The hypotheses for the present study are stated as null hypothesis:

1. There is no significant difference in metacognitive ability of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

   1.1 There is no significant difference in knowledge of cognition of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

   1.2. There is no significant difference in regulation of cognition of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

   1.3. There is no significant difference in metacognitive experience of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

2. There is no significant difference in the usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

   2.1. There is no significant difference in interest for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

   2.2. There is no significant difference in the time spent for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

   2.3. There is no significant difference in the usage of mobile phone for entertainment purpose of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

3. There is no significant difference in the awareness about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

   3.1. There is no significant difference in the awareness (educational purpose) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

   3.2. There is no significant difference in the awareness (health problem) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

3.3. There is no significant difference in the awareness (age restriction) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board of school.

4. There is no significant influence of usage of mobile phone, awareness of usage of mobile phone on metacognitive ability.

1.14 DELIMITATIONS OF THE STUDY

- The study will be delimited to the secondary school students of class IX and X in Dimapur district.
- The study will be delimited to those students which are affiliated to the Nagaland Board of School Education (NBSE) and Central Board of School Education (CBSE).

CHAPTER-II REVIEW OF LITERATURE

CHAPTER-II REVIEW OF LITERATURE

2.1 Introduction

2.2 Studies done in India

2.3 Studies done abroad

2.4 Summary of literature review

2.5 Research gap

CHAPTER-II
REVIEW OF LITERATURE

2.1 INTRODUCTION

A review of related literature is one of the essential components of any research work. Koul (2021) mentioned that a review of literature is a careful survey of research journals, books, dissertations, theses, and other sources which help the investigator gain knowledge on the work that others have done as a result of constant human endeavor. It gives the researcher a basis for judging the study from various sources, like journals, articles, and dissertations of online and offline resources.

In this chapter, the investigator has attempted to review some of the studies related to the survey undertaken review of literature done in India and abroad associated with Metacognitive ability and usage of mobile phones is as follows-

2.2 STUDIES DONE IN INDIA

Gupta & Bamel (2023) mentioned in their study that metacognition is positively associated to critical thinking. Their findings have established the need to provide management professionals with tools to develop metacognition as it promotes critical thinking prowess in the context of e-learning.

Putchavayala et al. (2023) found smart phone excessive usage is significantly and negatively associated with mindfulness and mindfulness is negatively correlated with basic psychological needs and frustration among the excessive usage of smart phone group.

Mandal & Mete (2023) found negative aspects of using social media and negatively impact students' research ability, and thinking capacity and hamper their writing quality.

Songa & Kamal (2023) studied "Effect of mobile phone tower radiation a different selected plant species. It revealed that exposure to mobile phone tower radiation had a significant effect on the growth of the selected plant species and exposure to mobile phone tower radiation can lead to oxidative stress and affect plant growth and health, and provides valuable insights into the potential impact of mobile phone tower radiation on plant growth and health.

Biswas & Bhadra (2022) studied "Usage patterns of mobile phone and internet among marginalized college students: a case study in Malda district, West Bengal." It was found that majority of students have already got formal training on the internet, but many of

them still don't get any kind of formal training and the majority of students use the internet to listen to music, chat, watch internet TV, read, use social networking sites, and play games.

Rajesh (2021) investigated "Meta cognition of secondary school students in relation to few variables" sand found that the secondary school girls had higher ability in meta-cognition than the other boys, and private unaided schools had higher ability in meta-cognition than the secondary school students from aided and government schools.

Bhatnagar & Sabharwal (2021) investigated the effects of mobile phone dependency on metacognition and social interest among young adults. The study found that mobile phone dependency increases unhelpful metacognition and decreases the level of social interest among young adults.

Kumar (2020) investigated "Relationship of academic procrastination with metacognition, perfectionism and internet usage among adolescents" and revealed that academic procrastination is more in urban adolescents as compared to rural adolescents; more in adolescent girls than adolescent boys, and stated that academic procrastination can best be predicted through an interactive effect of metacognition, perfectionism and internet usage in comparison to their independent effects.

Bajaj & Jain (2020) studied "Metacognitive ability, emotional intelligence and social intelligence in relation to employee's individual performance and team effectiveness" and found significant positive impact on individual employee performance and significantly linked to overall team effectiveness among the team level variables, only team size was a significant factor when studying the impact of metacognitive ability on team effectiveness.

Negi & Godiyal (2019) studied on mobile phone usage by undergraduate students and its relationship to their personality and values. It revealed that the male and female undergraduate students differ significantly in their time spend on mobile phone per day.

Rani & Deswal (2019) studied "Study habits, social competence and general well being in relation to mobile phone usage among senior secondary school students" and found significant negative relationship between study habits and mobile phone usage among senior secondary school students indicating that more usage of mobile phone leads to worsen the study habits of students.

Sonowal & Kalita (2019) studied "Metacognitive awareness and academic achievement of higher secondary level arts stream students of Dibrugarh District, Assam and revealed positive correlation between metacognitive awareness and academic achievement of arts

stream higher secondary level students of Dibrugarh district, and no significant difference between male and female, private and provincialized institutions and urban and rural studying in higher secondary level arts stream students of Dibrugarh district with respect to metacognitive awareness.

Ana & Singh (2018) found that the level of metacognition, motivation, self-efficacy, locus of control and home environment was better in girls, better among rural students and better among Private school students than Government school students of Jammu district

Rekha (2017) studied on the use of mobile phones and the awareness of its health hazards among higher secondary students and found that the average level of awareness on health hazards of mobile phone is high among the students.

Jaleel & Premachandran (2016) investigated a study on the metacognitive awareness of secondary school students and found that the secondary school students are identically distributed among each group in the metacognitive awareness and no significant difference in the metacognitive awareness of secondary school students based on their locale, gender and management of the school.

Sabna & Hameed (2016) studied "Metacognitive awareness for ensuring learning outcomes among the higher secondary students" and found that the mean scores of Metacognitive awareness for girls are higher than that of boys and also shown that urban school students' means scores of Metacognitive Awareness are higher than that of rural school students.

Sundari (2015) investigated "Effects of mobile phone use on academic performance of college going young adults in India" and found a significant relationship between gender and the learning skills by using mobile phone and significant relationship between age group of respondents on learning skills by mobile use.

Ansari et al. (2012) studied "Mobile phone adoption and appropriation among the young generation." and found significant relationship between different mode of use or appropriation with various different motivational factors and gave an insightful about teenagers' use and appropriation of mobile phone

Noushad (2008) explored on "Cognitions about cognitions: The theory of metacognition", literature revealed an intriguing phenomenon that school students are increasingly competent in cognitive metacognitive competencies but increasingly less competent in motivational-metacognitive competencies as they get older but differences due to gender have not been conclusive.

2.3 STUDIES DONE ABROAD

Drigas et al. (2023) mentioned that the influence of digital technology on parenting attributed to the demanding rhythm of family life and a parent's need to tackle everyday obstacles, and digital parenting tools tend to focus on the protective and preventive features while almost entirely discarding the issues related to the ethical approach of children's privacy.

Sudiatama et al. (2023) found a significant increase in students' reading skills, along with ease of learning during the pandemic and highlighted the efficacy of the MALL (mobile-assisted language learning) approach in improving students' reading skills and adapting to the pandemic-induced new teaching-learning process.

Montellado & Lovitos (2023) studied "Metacognitive awareness and attitude towards communicative approach of junior high school students" and revealed that the level of metacognitive awareness as perceived by Junior High School students is high while the attitude towards communicative approach was defined as moderate. It was found metacognitive awareness to have significant relationship to attitude towards communicative approach among Junior High School students.

Baars & Viberg (2023) mentioned that without instructional support, students are not able to effectively regulate their own learning and do not use the right learning strategies but providing instructional support for both metacognitive processes such as planning, monitoring and reflection, and cognitive processes such as learning strategies, can help students to learn in a self-regulated way more optimally.

Ozcakmak et al. (2021) revealed that academic achievement influenced their levels of metacognitive awareness positively. It found that levels of metacognitive awareness did not differ by gender and the pre service teachers knew which learning methods were effective and had the skills of planning, using and monitoring an approach that they expected to be successful for a task.

Sunday et al. (2021) indicated a negative relationship between smartphones addiction and learning which revealed that smart phone addiction has negative consequences on students' academic performance, and found that meta-analysis implied that addicted users show a diminished level in learning.

Abiodun et al. (2021) investigated "Metacognitive ability as determinant of senior secondary school students' academic performance in mathematics in Ondo State, Nigeria" and showed no significant influence of students' metacognitive ability on academic performance in Mathematics.

Yavuz et al. (2019) investigated on the "Relationships between nomophobia, alexithymia and metacognitive problems in an adolescent population" and found that Nomophobia, alexithymia and metacognition problem levels were significantly higher in females than males and there was a significant correlation between NMP-Q and TAS-20.

Cer (2019) investigated the effect of the "knowledge of cognition" and "regulation of cognition," which are processes of the metacognitive strategy for improving learners' writing skills and found that effective use the metacognitive strategy in learning and teaching to improve writing skills.

Damopolii & Kurniadi (2019) investigated Training students' metacognitive skills using mobile learning. It employed an experiment using a one-shot case study.It was found that students 'metacognitive skills are not very high, but the use of mobile learning can train students' metacognitive skills well.

Gurat (2018) mentioned that problem solvers' success and failures in mathematical tasks are affected by factors like time limit, attitudes, beliefs, and other factors and metacognitive strategy knowledge. Students have a greater chance to solve problems correctly if they use their metacognitive strategy knowledge in problem-solving. Through this, they can assess and realize their action from stage to stage. On the other hand, failure to use the metacognitive strategy leads to confusion or frustration. It also highlights the importance of the metacognitive approach in problem-solving in mathematical tasks among pre-service teacher education teachers

Ng et al. (2017) studied "The Relationship between smartphone use and academic performance: A Case of students in a Malaysian Tertiary Institution" and significant differences in smartphones usage depending on academic program and found more students utilized their smart phone for university learning activities which the lower their CGPA.

Kaliisa & Picard (2017) indicated that mobile learning at African higher education institutions enhances student and teacher collaboration. The findings also highlighted the significant challenges in integrating mobile knowledge into higher education institutions in Africa.

Asraf & Supian (2017) found that the most frequent activities utilized outside the classroom were using online dictionaries to assist with understanding word meanings, pronunciation practice of new words and posting on social media for newly acquired vocabulary in writing.

Listiana et al. (2016) designed "To compare the effect of the Group Investigation (GI) strategy, Think Talk Write (TTW), Group Investigation integrated with Think Talk Write (GITTW), and conventional teaching strategy on the students' meta-cognitive skills empowerment in biology teaching." The results of this research declared that students taught using the GI strategy, which is a form of cooperative learning, have higher metacognitive skills than those taught using the conventional teaching strategy.

Andreassen et al. (2016) studied the relationship between addictive use of social media and video games and symptoms of psychiatric disorder and revealed that correlations between symptoms of addictive technology use and mental disorder symptoms were all positive and significant, and male were significantly associated with addictive use of video games, whereas being female was significantly associated with addictive use of social media.

Diaz (2015) investigated on the 'Training in metacognitive strategies for students' vocabulary improvement by using learning journals' and found that metacognitive strategy training has positively contributed to vocabulary acquisition skills, as participants were able to raise consciousness about some learning strategies and the use of Metacognitive strategies to increase their vocabulary learning.

Ekanayake & Wishart (2014) found that as professional development for teachers was provided separately as planning and reviewing workshops which supported the teachers in recognizing the educational potential of mobile phones, in changing their attitudes towards the use of mobile phones in teaching and in sharing knowledge**.**

Woodcock et al. (2012) found that students who own smartphones are unaware of their potential to support learning and do not install smart phone applications for that purpose.

White & Mills (2012) studied 'Examining attitudes towards and usage of smartphone technology among Japanese University students studying EFL' and found that students were increasingly adopting smartphones for personal use but reluctant to use the devices for education purposes, based on current application.

Cihanoglu (2012) studied "Metacognitive awareness of teacher candidates" and found no difference according to gender, high school type graduated, type of education whether it was day or evening and grade point averages.

Nat et al. (2011) investigate the impact of students' metacognitive awareness on their learning outcomes within technology enhanced learning environments and found that the design of a TEL (Technology enhanced learning) environment and the development of students' metacognitive skills have a direct bearing on learning performance.

Thomee et al. (2011) investigated "Mobile phone use and stress, sleep disturbances and symptoms of depression among young Adults- A perspective cohort study." It was found that there were cross-sectional associations between high compared to low mobile phone use and stress, sleep disturbances, and symptoms of depression for the men and women.

Gentile (2009) investigated 'Pathological video-game use among youth ages 8 to 18: A National Study' and revealed that pathological gamers spent twice as much time than non-pathological gamers and received poorer grades in school, and showed comorbidity with attention problems.

Dos (2008) studied "The relationship between mobile phone use, metacognitive awareness and academic achievement" and found no statistically significant result between mobile phone usage and happiness, academic achievement and metacognitive awareness. This study also revealed that metacognitive awareness is very important for academic achievement and satisfaction with life.

Zulkiply (2006) investigated "Metacognition and its relationship with students' academic performance." It was found a significant positive relationship between student's academic performance and metacognitive awareness, students' academic performance seems to correlate positively with metacognitive regulation, but not with metacognitive knowledge.

Aoki & Downes (2003) studied "An analysis of young people's use of and attitudes toward cell phones." It was found that the longer the ownership of a cell phone, the more calls the person receives; the stronger the person feels that a cell phone is significant; and the more dependent the person upon the phone.

2.4 SUMMARY OF LITERATURE REVIEW

From the above review of literature, it can be seen that there are several studies already done with issues related with metacognition and mobile phone both studies done at national and international. The above literature review revealed several studies already done related to metacognition and usage of mobile phones. Studies depict that school students are increasingly competent in cognitive metacognitive competencies but less competent in motivational metacognitive competencies as they age. They also studied the effective use of metacognitive strategies in learning and cognitive processes help students Studies also expressed that the mean score of metacognitive awareness varies among boys and girls and between rural and urban school students. In contrast, one of the studies revealed that no significant difference in metacognitive awareness based on locale,

gender, or management of the school. The study revealed that the level of metacognition, motivation, self-efficacy, locus of control, and in the home environment was better in girls than boys and better among rural than urban school students. Other studies depicted that metacognitive awareness and achievement among the students indicated a positive correlation between the two variables. One of the studies showed that study habits, social competence, general well being in relation to usage of mobile phone found a significant negative relationship between the study habits and mobile phone usage.

Different studies indicted a negative relationship between smart phone addiction and learning, but one of the studies revealed the connection between smart phone and academics and found it significantly positive. Another study showed that metacognitive skills of the students can be trained by the use of mobile phone. One of the studies revealed that influence of digital technology on parents attributed to the demand of the family life and parent need to tackle everyday obstacles. Lastly, study found that a significant increase in students reading skills and highlighted the efficacy of mobile assisted language approach in improving students reading skills in the teaching learning process.

2.5 RESEARCH GAP

The above studies revealed a growing body of literature exploring the impact of mobile phone usage on student learning and behavior, and an increasing number of researchers have drawn attention to the concept of the need for metacognition. Existing studies have predominantly focused on the adverse effects of mobile phone distraction on academic performance, training metacognitive skills, and the relationship between mobile phone use, metacognitive awareness, and academic achievement with limited attention to how students' metacognitive ability, such as self-monitoring, self-regulation, and strategic planning, may influence their mobile phone usage among the students. Understanding the interplay between metacognitive abilities and mobile phone usage is essential in understanding how these devices impact student learning and cognitive development. A notable research gap remains concerning the specific relationship between metacognitive ability and mobile phone usage among students. This research study aims to address this gap by examining the metacognitive ability and use of mobile phone among secondary school students in the Dimapur district, thereby contributing to a deeper understanding of the study.

CHAPTER-III METHODOLOGY

CHAPTER-III METHODOLOGY

CHAPTER-III
METHODOLOGY

3.1 INTRODUCTION

This chapter deals with the methodology of the study. It gives in detail the methods and procedures to be followed to meet this research's objectives. Research methodology refers to the systematic process and techniques researchers use to conduct empirical investigations, gather data, analyze information, and draw valid and reliable conclusions. The present study has undertaken to investigate the study of metacognitive ability in relation to the usage of mobile phone among secondary school students in the Dimapur district.

3.2 RESEARCH DESIGN

According to Selltiz et al. defined “A research design is the arrangement of conditions for collections and analysis of data in a manner that aims to combine relevance in the research purpose with economy in procedure" (Kumar, 2021).

Research design is the overall plan or structure guiding a research study. It is a crucial aspect of the research process as it outlines how data will be collected, analyzed, and interpreted to address a specific research question or hypothesis. Thus, research design is a crucial aspect of the research process that outlines how a study will be conducted, from formulating research questions to collecting and analyzing data, and it plays a vital role in ensuring the validity and reliability of research findings.

3.2.1 METHOD OF STUDY

In research design, the method of study refers to the systematic approach or strategy employed for gathering and examining the data to answer the research questions or test hypotheses. Descriptive research is a design used to observe, describe, and document a particular subject or population's characteristics, behaviors, and phenomena. It aims to provide a comprehensive and detailed account of what is studied without attempting to manipulate or control variables. The present study used a descriptive survey method.

3.2.2 POPULATION

The population is any group that has one or more characteristics in common and that are of interest to the researcher. A population is defined as a group of individuals with at least one common characteristic that distinguishes that group from other individuals (Best et al., 2019).

The present study intended to study the metacognitive ability in relation to usage of mobile phone. Hence, the population of this study comprised all the secondary school students of class 9 & 10, both private and Government, affiliated with the Nagaland Board of School Education (NBSE) and Central Board of School Education (CBSE) in the Dimapur district.

3.2.3 SAMPLE AND SAMPLING PROCESS

Sampling in educational research refers to selecting a subset of individuals, items, or elements from a larger population to conduct a study or research project. Sampling aims to gather data from a representative group of participants or subjects that can provide insights and generalizations about the entire population without having to study every member. Sampling allows researchers to conduct studies about a large group using a small portion of the population.

For the present research, a multi-stage random sampling technique was employed. At first-stage, 12 schools were selected based on a stratified simple random sampling technique. Total 850 secondary school students from class 9^{th} and 10^{th} were selected through stratified simple random sampling techniques for the study.

Table no. 3.1: Sample selected schools

SL. NO	NAME OF THE SCHOOL	MANAGEMENT	BOARD
1.	Govt. High school, Lengrijan	Government	NBSE
2.	Govt. High school, Sarbura	Government	NBSE
3.	Govt. Higher School, Purana Bazar	Government	NBSE
4.	Govt. High School, Darogapathar	Government	NBSE
5.	Kendriya Vidyalaya, Sewak	Government	CBSE
6.	Delhi Public School, 2 ½ mile	Private	CBSE

7.	Livingstone foundation International, Thahekhu	Private	CBSE
8.	St.Mary Higher Secondary School, Dimapur	Private	CBSE
9.	Lima Aier Higher Sec School, Lengrijan	Private	NBSE
10.	Christian Higher Sec School, Dimapur	Private	NBSE
11.	St Stephen's Higher Sec School, Dimapur	Private	NBSE
12.	S.D Jain Higher Sec School, West yard colony, Dimapur	Private	NBSE

Table no. 3.2: Representation of sample size

	Government				Private				Total
	CBSE		NBSE		CBSE		NBSE		
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	
9th	30	25	53	74	65	60	66	78	451
10th	-	-	59	66	59	70	67	78	399
Total	30	25	112	140	124	130	133	156	850

3.2.4 DESCRIPTION OF THE TOOLS

The instrument which is used gathering or collecting facts for exploring new filled is called tools. In order to obtain information or data three tools has been used according to the requirement of the study.

The tool used for the study:

Tool 1: Standardized Metacognition Scale (MCS-SMBA).

Tool 2: Self developed questionnaire for Usage of mobile phone.

Tool 3: Self developed questionnaire for Awareness of the mobile phone.

Description of tool-1 (Metacognitive ability)

Metacognition scale: Metacognition scale MCS-SMBA developed by Mubarak Singh and Ana Bali in the year 2017. The tool comprised of 50 items in the scale. The present

scale is 'Likert type scale' have multiple responses ranging on five-point scale, viz., Strongly Agree (SA), Agree(A), Undecided (UD), Disagree (DA) and Strongly Disagree (SA).

Following are the three major dimensions in this scale:

1. Knowledge of cognition
2. Regulation of cognition
3. Metacognitive experiences

Table no. 3.3: Distribution of items in the final form of the Metacognition scale

Major dimensions of Metacognition		**Nature of items**	**Item No.**	**Total**
1	Knowledge of cognition	Positive	1,4,6,10,11,15,19,22, 23,24,26,27,28,29,30,33,35, 37,39,41, 42, 43, 45,	23
		Negative	7,50	2
2.	Regulation of cognition	Positive	2,8,9,12,13,14,20,21,25,31, 32,34,44,49	14
		Negative	18	1
3.	Metacognitive experiences	Positive	3,5.16,17,36,38,40,46, 47,48	10
		Negative	-	**0**
Positive items=47 + Negative items=03			**Total items**	**50**

RELIABILITY OF THE TEST

The tool developer has used test-retest method for seeking the reliability of the test. The co-efficient of correlation between the two sets of scores was +0.81, which is significant at 0.01 level of significance.

SCORING

Table no. 3.4: Scoring system of Metacognitive ability

SR. NO.	**TYPE OF ITEMS**	**STRONGLY AGREE**	**AGREE**	**UNDECIDED**	**DISAGREE**	**STRONGLY DISAGREE**
1	POSITIVE	5	4	3	2	1
2	NEGATIVE	1	2	3	4	5

Table no. 3.5: Norms for interpretation of Level of Metacognitive ability

Sl.No.	Range of Raw score	Range of Z-scores	Grade	Level
1	204 and above	+2.01 & above	A	Extremely High
2	189 to 203	+1.26 to +2.00	B	High
3	173 to 188	+0.51 to +1.25	C	Above average
4	153 to 172	-0.50 to + 0.50	D	Average/ Moderate
5	137 to 152	-1.25 to -0.51	E	Below Average
6	122 to 136	-2.00 to -1.26	F	Low
7	121 and below	-2.01 & below	G	Extremely Low

Description of tool-2 (Usage of Mobile phone)

The questionnaire has been developed by the researcher to assess the usage of mobile phone. The tool contained total 21 items.

Steps of development of tool

1. **Construction of items:** At first 30 items were constructed based on the dimensions mentioned below-

The major dimensions for the usage of mobile phone are:

1. Interest in mobile phone
2. Time spent on mobile phone
3. Time spent for gaming
4. Time spent for entertainment

2. Validation: The tool has not been properly standardized but content validity has been with the help of the experts. The questionnaire has been given to some experts having vast experiences in teaching and research for the content validity of the tool. After the content validity, 09 items have been deleted.

21 items in the tool were selected for usage of mobile phone. In which 11 items were analysis through percentage and remaining 10 items has developed based on Likert 5-point scale.

Table no. 3.6: Distribution of items in the final form of the Usage of mobile phone

Sl No.		MAJOR DIMENSIONS	NO. OF ITEMS	TOTAL
I.	USAGE OF MOBILE PHONE	1.INTEREST IN MOBILE PHONE USAGE	2,3,5*,6*,7,9,10,12*, 13*, 15,17*	11
		2.TIME SPENT ON MOBILE PHONE	4*, 8, 14*, 16*	4
		3.TIME SPENT FOR GAMING	1*,11*	2
		4.TIME SPENT FOR ENTERTIANMENT	18*, 19, 20, 21*	4
Total items				21

*** (Percentage)**

Scoring and its interpretation of usage of mobile phone:

Scoring has been done based on the five-point scale for each question. Norms have been developed for secondary school students for interpretation of usage of mobile phone. High score indicates low usage of mobile phone.

Table no. 3.7: Norms for interpretation for Usage of Mobile phone

Sl.No.	Range of Raw score	Range of Z-scores	Grade	Level
1	204 and above	+2.01 & above	A	Extremely Low
2	189 to 203	+1.26 to +2.00	B	Low
3	173 to 188	+0.51 to +1.25	C	Below Average
4	153 to 172	-0.50 to + 0.50	D	Average/ Moderate
5	137 to 152	-1.25 to -0.51	E	Above average
6	122 to 136	-2.00 to -1.26	F	High
7	121 and below	-2.01 & below	G	Extremely High

Description of tool-3(Awareness of mobile phone usage)

The questionnaire has been developed by the researcher to assess the awareness of mobile phone. The tool contained total 11 items.

Steps of development of tool

1. **Construction of items:** At first 20 items were constructed based on the dimensions mentioned below-

The major dimensions for the Awareness of mobile phone usage are:

1.Awareness on educational purpose

2.Awareness on health problem

3.Awareness on age restriction

2. Validation: The tool has not been properly standardized but content validity has been with the help of the experts. The questionnaire has been given to some experts having vast experiences in teaching and research for the content validity of the tool. After the content validity, 09 items have been deleted. 11 items in the tool were selected for awareness of mobile phone. In which 1 item were analysis through percentage and remaining 10 items has developed based on Likert 5-point scale.

Table no. 3.8: Distribution of items in the final form of the awareness of mobile phone usage

Sl No.		**MAJOR DIMENSIONS**	**NO. OF ITEMS**	**TOTAL**
II.	AWARENESS ABOUT USAGES OF MOBILE PHONE	1.AWARENESS ON EDUCATIONAL PURPOSE	7,8,9,10	4
		2.AWARENESS ON HEALTH PROBLEM	1,2,3*,4,5,11	6
		2.AWARENESS ON AGE RESTRICTION	6	1
			Total items	11

*** (percentage)**

Scoring and its interpretation of awareness of mobile phone usage:

Scoring has been done based on the five-point scale for each question. Norms have been developed for secondary school students for interpretation of awareness of mobile phone. High score indicates high awareness of mobile phone.

Table no. 3.9: Norms for interpretation of Awareness of mobile phone usage

Sl.No.	Range of Raw score	Range of Z-scores	Grade	Level
1	204 and above	+2.01 & above	A	Extremely High
2	189 to 203	+1.26 to +2.00	B	High
3	173 to 188	+0.51 to +1.25	C	Above average
4	153 to 172	-0.50 to + 0.50	D	Average/ Moderate
5	137 to 152	-1.25 to -0.51	E	Below Average
6	122 to 136	-2.00 to -1.26	F	Low
7	121 and below	-2.01 & below	G	Extremely Low

3.3 METHOD OF DATA COLLECTION

Data were collected from the selected samples of secondary school students. Personal visits were undertaken, and data were collected using the tool and the other in the form of a questionnaire. First of all, a permission letter was taken from the supervisor and given to the Head of the schools to get the permission to collect data. With the approval of the school's authority, the investigator met the students and proper instructions were given to them. Tools were administered to the students in presence of their class teacher. After the completion, tools were collected back from the students. After that, data was recorded and analyzed with the help of different statistical techniques

3.4 STATISTICAL TECHNIQUES USED

On the basis of the nature and distribution of the data appropriate statistical and non statistical techniques were applied for the analysis of data. The analysis of the data has been done with the help of Microsoft excel. The following are the techniques used in the present study for analysis and interpretation of data:

1. The items mentioned in both **table no. 3.6 & 3.8** with (*****) marks were analyzed only by simple percentage.

2. The simple descriptive statistical techniques like computation of mean, standard deviation, and z score were used to ascertain the level and status of various concerned variables and results were presented graphically in form of pie-chart.

3. T-test were applied to test the significance of difference in the mean score of different variables based on gender, type of management, class and board.

4. Linear multiple regression was applied to test significant influence of usage of mobile phone and awareness of usage of mobile phone on metacognitive ability.

CHAPTER-IV ANALYSIS AND INTERPRETATION

CHAPTER-IV ANALYSIS AND INTERPRETATION

4.1 Introduction

4.2 Objective 1: To study the level of metacognitive ability of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class and board

4.3 Objective 2: To study the usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class and board

4.4 Objective 3: To study the awareness about the usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class and board

4.5 Objective 4: To study the significant influence of usage of mobile phone, awareness of usage of mobile phone on metacognitive ability for secondary school students in Dimapur district of Nagaland

CHAPTER-IV
ANALYSIS AND INTERPRETATION

4.1 INTRODUCTION

Data analysis means studying organized material to discover inherent facts. It refers to examining, inspecting, transforming, and interpreting raw data to uncover patterns, insights, relationships, and meaningful information. It involves using various techniques, tools, and methodologies to extract valuable knowledge from data sets. Data Interpretation refers to drawing inferences from the collected facts after an analytical study. It includes transforming raw data into meaningful insights, patterns, and conclusions that can provide valuable information for addressing research questions or hypotheses.

Analysis and interpretations of the data has been done with the help of statistical tests with graphical representation done by the Excel. The researcher has analyzed the data on the basis of score of Metacognitive ability, usage of mobile phone and awareness of mobile phone of secondary school students in Dimapur district. In order to find out the level and comparison between dependent and independent variables based upon the categorical variables, the data has been analyzed and interpreted using descriptive statistics such as mean, standard deviation, z score and the hypotheses is tested by employing 't' test.

4.2 OBJECTIVE 1: TO STUDY THE LEVEL OF METACOGNITIVE ABILITY OF SECONDARY SCHOOL STUDENTS IN DIMAPUR DISTRICT OF NAGALAND WITH RESPECT TO GENDER, TYPE OF MANAGEMENT, CLASS AND BOARD

Research question 1: What is the level of metacognitive ability of secondary school students in Dimapur district of Nagaland?

The analysis and interpretation of this objective has been done by calculating the frequency distribution of the scores and the percentage has been taken out on the basis of **z-score** which has been calculated by the researcher for each individual in the sample.

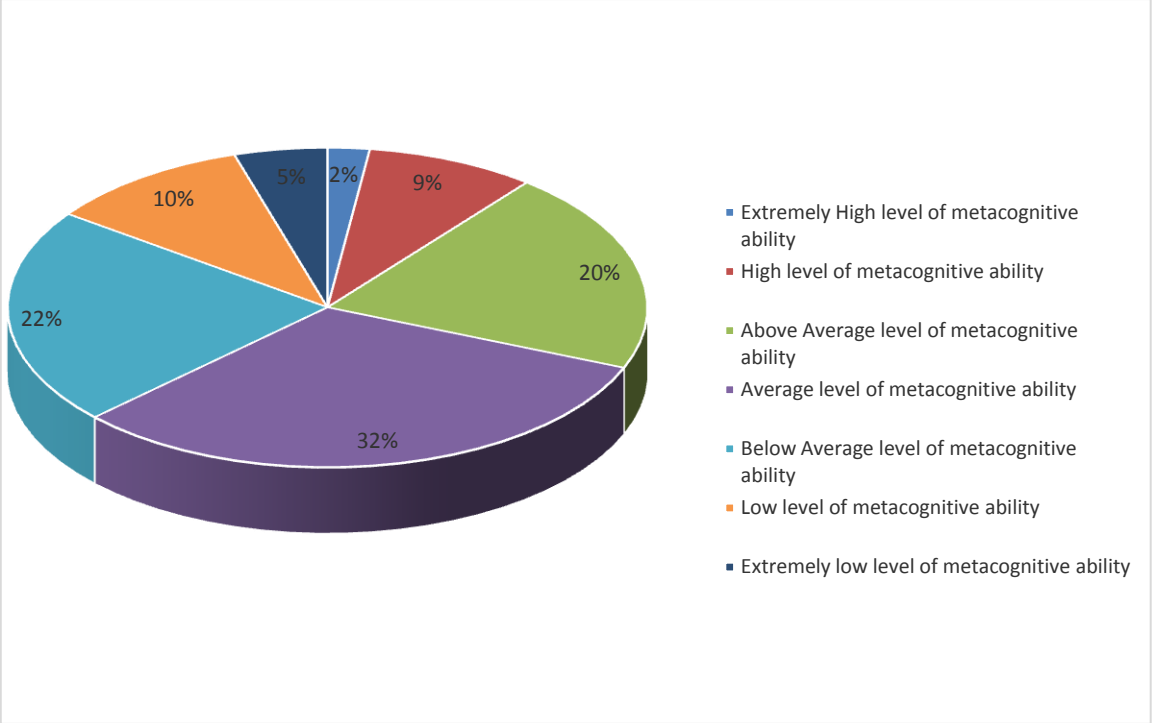


Fig 4.1: Graphical representation showing levels of metacognitive ability of secondary school students in Dimapur district of Nagaland

Fig 4.1 It can be seen that only 2% of students having extremely high level of metacognitive ability, 9% students having high level of metacognitive ability, 20% students having above average level of metacognitive ability, 32% students having average level of metacognitive ability, 22% students having below average level of metacognitive ability, 10% students having low level of metacognitive ability, and 5% students having extremely low level of metacognitive ability. It shows that 31% of the students in Dimapur district are able to know their own cognitive processes very well. The percentage has been taken out on the basis of **z-score** which has been calculated by the researcher for each individual in the sample

Hypothesis -1: There is no significant difference in metacognitive ability of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

In order to find the significant difference of dimension and categorical variables, the data has been analyzed and interpreted using descriptive statistics such as mean, standard deviation and the above hypothesis is tested by employing 't' test. The value

of 't' critical was set at 1.96 for 0.05 the level of significance with df=398. It is presented in table below.

Table No. 4.1: Metacognitive ability in Dimapur district of Nagaland with respect to gender, type of management, class, and board

Dimension and its Variables			N	Mean	SD	t Stat	P(T<=t) two-tail	Significant/ not Significant at 0.05/0.01
Metaco-gnitive ability	1.Gender	Girl	451	186.57	19.647	0.88	0.38	Not significant
		Boy	399	185.35	20.998			
	2.Type of Management	Government	307	184.01	21.229	-2.11	0.04	Significant
		Private	543	187.12	19.670			
	3.Class	9^{th}	451	185.48	20.992	-0.80	0.42	Not significant
		10^{th}	399	186.59	19.475			
	4.Board of school	CBSE	309	184.74	23.298	-1.28	0.20	Not significant
		NBSE	541	186.72	18.336			

Note: t critical for 398 df at 0.05 level of significance=1.96

1. Mean score of level of metacognitive ability of girl is 186.67 and the mean score of boy secondary students is 185.35. The standard deviation (SD) of girl is 19.647 and that of boy is 20.998 [**table no.4.1 (1)**].

Table no. 4.1 (1) it can be seen that the p-value is 0.38 (P>0.05) which is more than 0.05 and t-value is 0.88 which is less than the table value (1.96). Thus, the null hypothesis, **"There is no significant difference in metacognitive ability of secondary school students in Dimapur district of Nagaland with respect to gender,"** is accepted. The reason of no significant difference in this study may be because of similar thinking processes in both girl and boy to solve intricate problems due equal educational

opportunities and experiences. Similar study which is supported by Dubey and Kapoor (2019) also found that no difference in the level of metacognitive learning in the male and female higher secondary students. Contrary to this finding, a study by Rajesh (2021) found a significant difference in the Meta Cognition Ability of secondary school boys and girls.

2. Mean score of level of metacognitive ability of government secondary students is 184.01 and the mean score of private secondary students is 187.12. The standard deviation (SD) of government secondary students and that of Private secondary students are is 21.229 and 19.670 respectively [**table no.4.1(2**)].

Table no. 4.1(2) it can be seen that the p-value is 0.04 (P<0.05) which is less than 0.05 and t-value is -2.11 which is less than the t critical value (1.96). Thus, the null hypothesis, "**There is no significant difference in metacognitive ability of secondary school students in Dimapur district of Nagaland with respect to type of management"** is rejected. These findings suggest that private schools are more aware of their metacognitive ability than government school's students according to the mean scores. It is supported by a study conducted by Kadian (2016) which found that "the mean scores on executive intelligence, executive functioning, metacognition awareness and academic achievement of private school students was higher than public schools.

3. Mean score of level of metacognitive ability of class 9^{th} secondary students is 185.48 and the mean score of class 10^{th} secondary students is 186.59. The standard deviation (SD) of 9^{th} secondary students is 20.992 and that of 10^{th} secondary students is 19.475 [**table no.4.1(3**)].

T**able no. 4.1(3)** it can be seen that the p-value is 0.42 (P>0.05) which is more than 0.05 and t-value is -0.80 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in the level of metacognitive ability of secondary school students in Dimapur district of Nagaland with respect to class"** is accepted.

4.Mean score of level of metacognitive ability of CBSE secondary students is 184.74 and the mean score of NBSE secondary students is 186.72. The standard deviation (SD) of CBSE secondary students is 23.298 and that of NBSE secondary students is 18.336 [**table no.4.1(4)].**

Table no. 4.1(4) it can be seen that the p-value is 0.20 (P>0.05) which is more than 0.05 and t-value is -1.28 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in the level of metacognitive ability of secondary school students in Dimapur district of Nagaland with respect to board"** is accepted.

DIMENSION WISE ANALYSIS

Research question 1.1: What is the level of knowledge of cognition of secondary school students in Dimapur district of Nagaland?

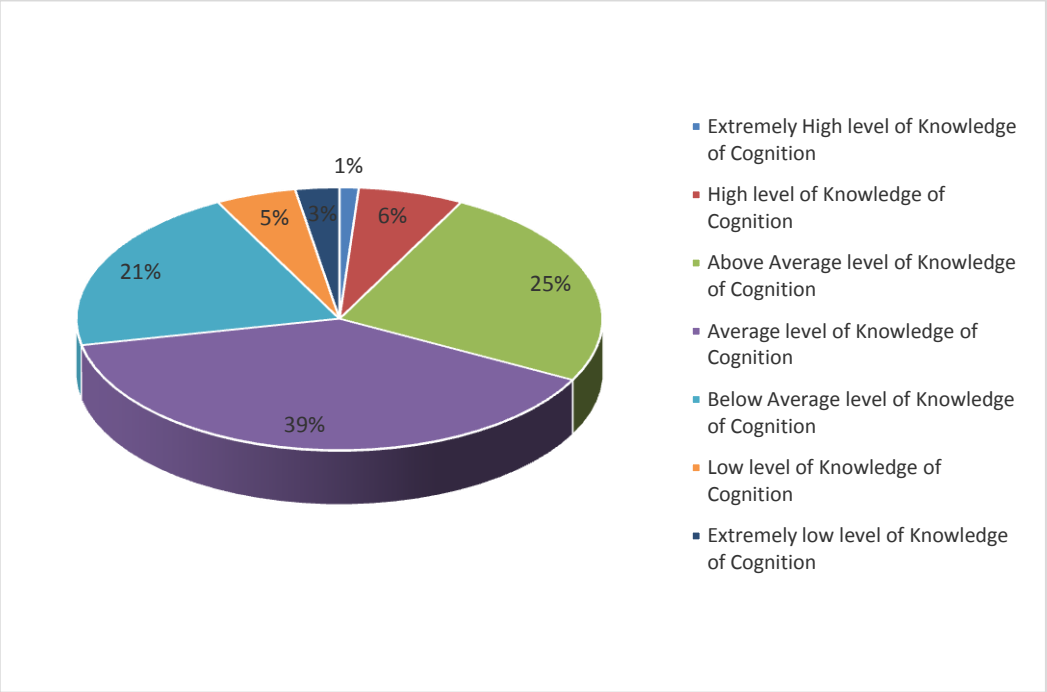


Fig 4.2: Graphical representation showing level of knowledge of cognition of secondary school students in Dimapur district of Nagaland

Fig 4.2 It can be seen that only 1% of students having extremely high level of knowledge of cognition, 6% students having high, 25% students having above average, 39% students having average, 21% students having below average, 5% students having low, and 3% students having extremely low level of knowledge of cognition. The percentage has been taken out on the basis of **z-score** which has been calculated by the researcher for each individual in the sample

Hypothesis 1.1: There is no significant difference in knowledge of cognition of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

Table No. 4.2 Knowledge of cognition in Dimapur district of Nagaland with respect to gender, type of management, class, and board

Major Dimension and its Variables			**N**	**Mean**	**SD**	**t Stat**	**P(T<=t) two-tail**	**Significant/ not Significant at 0.05/0.01**
Knowledge of cognition	1.Gender	Girl	451	91.79	10.117	0.44	0.66	Not significant
		Boy	399	91.47	10.849			
	2.Type of Management	Government	307	90.50	10.782	-2.35	0.02	Significant
		Private	543	92.28	10.231			
	3.Class	9	451	91.43	10.558	-0.62	0.53	Not significant
		10	399	91.87	10.360			
	4.Board of school	CBSE	309	91.07	11.812	-1.13	0.26	Not significant
		NBSE	541	91.96	9.603			

Note: t critical for 398 df at 0.05 level of significance=1.96

1. Mean score of girl secondary students is 91.79 and the mean score of boy secondary students is 91.47. The standard deviation (SD) of girl secondary students is 10.117 and that of boy secondary students is 10.849[**table no 4.2(1**)].

From **table no. 4.2(1)** it can be seen that the p-value is 0.66 (P>0.05) which is more than 0.05 and t-value is 0.44 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in knowledge of cognition of secondary school students in Dimapur district of Nagaland with respect to gender"** is accepted. It is also supported by one of the study by Sabna and Hameed (2016) which

revealed that there is no significant difference in the metacognitive awareness between boys and girls students.

2. Mean score of government secondary students is 90.50 and the mean score of private secondary students is 92.28. The standard deviation (SD) of government secondary students is 10.782 and that of private secondary students is 10.231**[table no 4.2(2)].**
Table no. 4.2(2) it can be seen that the p-value is 0.02 (P<0.05) which is less than 0.05 and t-value is -2.35 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in knowledge of cognition of secondary school students in Dimapur district of Nagaland with respect to management"** is rejected. This result has contrary found study by Das (2015) which indicated that there is no significant difference has between the students of private and government teacher training colleges in their metacognitive ability.

3. Mean score of class 9^{th} secondary students is 91.43 and the mean score of class 10^{th} secondary students is 91.87. The standard deviation (SD) of 9^{th} secondary students is 10.558 and that of 10^{th} secondary students is 10.360 [**table no 4.2(3**)].
Table no. 4.2(3) it can be seen that the p-value is 0.53 (P>0.05) which is more than 0.05 and t-value is -0.62 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in Knowledge of Cognition of secondary school students in Dimapur district of Nagaland with respect to class"** is accepted. This outcome is in contrast to the study by Das (2015) which show that there is significant difference in metacognitive ability between students of graduate and post graduate level.

4. Mean score of CBSE secondary students is 91.07 and the mean score of NBSE secondary students is 91.96. The standard deviation (SD) of CBSE secondary students is 11.812 and that of NBSE secondary students is 9.603 [**table no 4.2(4**)].
Table no. 4.2(4) it can be seen that the p-value is 0.26 (P>0.05) which is more than 0.05 and t-value is -1.13 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in knowledge of cognition of secondary school students in Dimapur district of Nagaland with respect to board"** is accepted.

Research question 1.2: What is the level of regulation of cognition of secondary school students in Dimapur district of Nagaland?

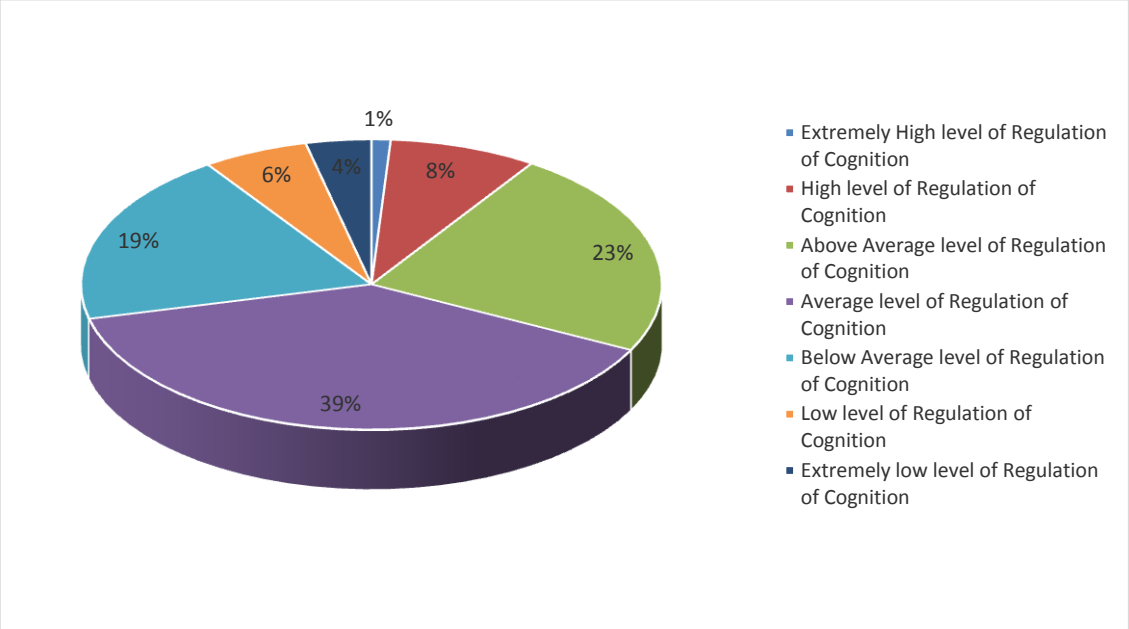


Fig 4.3: Graphical representation showing level of regulation of cognition of secondary school students in Dimapur district of Nagaland

Fig 4.3 It can be seen that only 1% of students having extremely high level of regulation of cognition, 8% students having high, 23% students having above average, 39% students having average, 19% students having below average, 6% students having low, and 4% students having extremely low level of regulation of cognition. The percentage has been taken out on the basis of z-score which has been calculated by the researcher for each individual in the sample.

Hypothesis 1.2: There is no significant difference in regulation of cognition of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

Table No. 4.3: Regulation of cognition of secondary school students in Dimapur district of Nagaland with respect to gender type of management, class, and board

Major Dimension and its Variables			N	Mean	SD	t Stat	P(T<=t) two-tail	Significant/ not Significant at 0.05/0.01
Regulation of cognition	1.Gender	Girl	451	55.01	7.514	-0.14	0.89	Not significant
		Boy	399	55.09	7.481			
	2.Type of Management	Government	307	54.67	7.470	-1.10	0.27	Not significant
		Private	543	55.26	7.506			
	3.Class	9^{th}	451	54.67	7.747	-1.56	0.12	Not significant
		10^{th}	399	55.47	7.184			
	4.Board of school	CBSE	309	54.33	8.554	-1.97	0.05	Significant
		NBSE	541	55.45	6.791			

Note: t critical for 398 df at 0.05 level of significance=1.96

1. Mean score of girl secondary students is 55.01 and the mean score of boy secondary students is 55.09. The standard deviation (SD) of girl secondary students is 7.514 and that of boy secondary students is 7.481[**table no.4.3(1**)].

Table no. 4.3(1) it can be seen that the p-value is 0.89 (P>0.05) which is more than 0.05 and t-value is -1.14 which is less than the t critical value (1.96). Thus, the null hypothesis, "**There is no significant difference in regulation of cognition of secondary school students in Dimapur district of Nagaland with respect to gender"** is accepted. Similar study by Singh and Kumar (2014) revealed that male and female senior secondary students differ significantly on metacognition based on the mean scores which indicate that male students are found to be higher on metacognition as compared to female students. In contrast Stel et al. (2010) stated that metacognitive ability is gender sensitive and that it affects the actual process of learning.

2. Mean score of regulation of cognition of government secondary students is 54.67 and the mean score of private secondary students is 55.26. The standard deviation (SD) of government secondary students is 7.470 and that of private secondary students is 7.506[**table no.4.3(2**)].

Table no. 4.3(2) it can be seen that the p-value is 0.27 (P>0.05) which is more than 0.05 and t-value is -1.10 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in regulation of cognition of secondary school students in Dimapur district of Nagaland with respect to management"** is accepted

3. Mean score of class 9^{th} secondary students is 54.67 and the mean score of class 10^{th} secondary students is 55.47. The standard deviation (SD) of 9^{th} secondary students is 7.747 and that of 10^{th} secondary students is 7.184[**table no.4.3(3**)].

Table no. 4.3(3) it can be seen that the p-value is 0.12 (P>0.05) which is more than 0.05 and t-value is -1.56 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in regulation of cognition of secondary school students in Dimapur district of Nagaland with respect to class"** is accepted.

4. Mean score of CBSE secondary students is 54.33 and the mean score of NBSE secondary students is 55.45. The standard deviation (SD) of CBSE secondary students is 8.554 and that of NBSE secondary students is 6.791[**table no.4.3(4**)].

Table no. 4.3(4) it can be seen that the p-value is 0.05 (P=0.05) which is equal to 0.05 and t-value is -1.97 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in regulation of cognition of secondary school students in Dimapur district of Nagaland with respect to board",** is rejected.

Research question 1.3: What is the level of metacognitive experiences of secondary school students in Dimapur district of Nagaland?

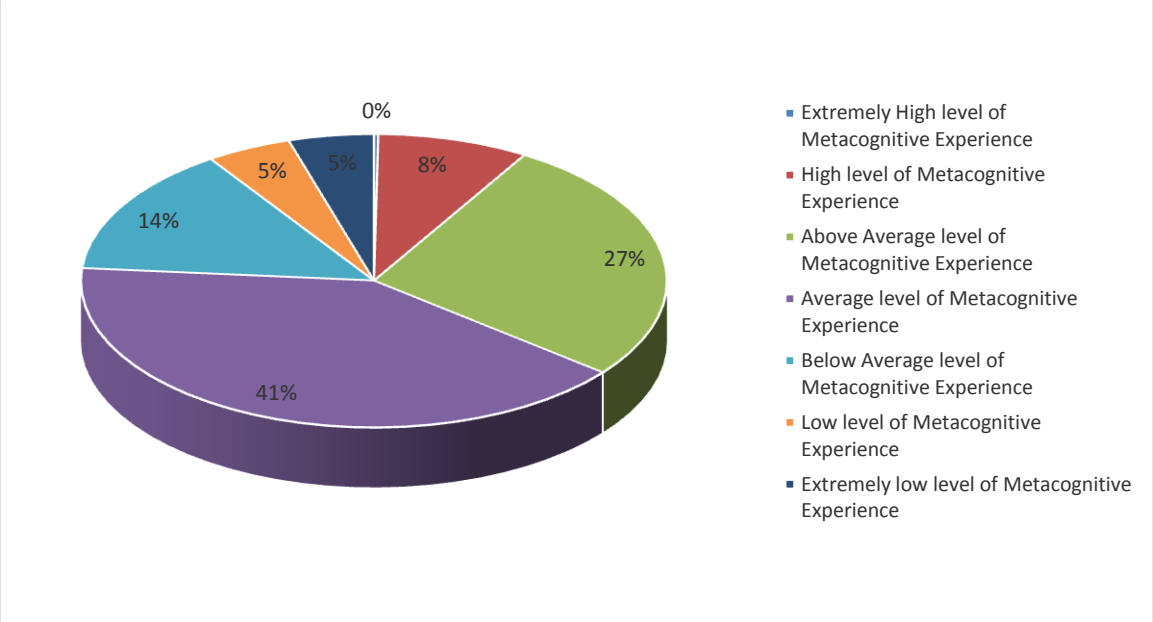


Fig 4.4: Graphical representation showing level of metacognitive experiences of secondary school students in Dimapur district of Nagaland

Fig 4.4 It can be seen that only 0% of students having extremely high level of Metacognitive experiences, 8% students having high level of metacognitive experiences, 27% students having above average level of metacognitive experiences, 41% students having average level of metacognitive experiences, 14% students having below average level of metacognitive experiences, 5% students having low level of metacognitive experiences, and 5% students having extremely low level of metacognitive experiences. The percentage has been taken out on the basis of **z-score** which has been calculated by the researcher for each individual in the sample.

Hypothesis 1.3: There is no significant difference in Metacognitive experience of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

Table No. 4.4: Metacognitive experience of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

Major Dimension and its Variables	N	Mean	SD	t Stat	P(T<=t) two-tail	Significant/ not Significant at 0.05/0.01

Metacog-nitive experience	1.Gender	Girl	451	39.78	4.619	2.79	0.01	Significant
		Boy	399	38.79	5.521			
	2.Type of Management	Government	307	38.84	5.415	-2.01	0.05	Significant
		Private	543	39.59	4.869			
	3.Class	9^{th}	451	39.38	5.173	0.38	0.71	Not significant
		10^{th}	399	39.25	4.984			
	4.Board of school	CBSE	309	39.33	5.353	0.08	0.94	Not significant
		NBSE	541	39.30	4.927			

Note: t critical for 398 df at 0.05 level of significance=1.96

1. Mean score of girl secondary students is 39.78 and the mean score of boy secondary students is 38.79. The standard deviation (SD) of Girl secondary students is 4.619 and that of Boy secondary students is 5.521[**table no. 4.4(1**)].

Table no. 4.4(1) it can be seen that the p-value is 0.01 (P<0.05) which is less than 0.05 and t-value is 2.79 which is greater than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in metacognitive experience of secondary school students in Dimapur district of Nagaland with respect to gender"** is rejected. This result resonates with a study by Dubey and Kapoor (2019), a comparison of Problem-solving ability in male and female higher secondary students. They found that the male and female respondents are different in their higher cognitive ability, i.e., Problem-solving which indicated male respondents showed higher Problem-solving ability than female respondents. In contrast, the study by Abiodun et al. (2021) found no significant relationship between male and female students' metacognitive ability on their Mathematics performance among senior secondary school students in Ondo State.

2. Mean score of metacognitive experience of government secondary students is 38.84 and the mean score of private secondary students is 39.59. The standard deviation (SD) of

Government secondary students is 5.415 and that of Private secondary students is 4.869 [**table no. 4.4(2**)].

Table no. 4.4(2) it can be seen that the p-value is 0.05 (P=0.05) which is equal to 0.05 and t-value is -2.01 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in metacognitive experience of secondary school students in Dimapur district of Nagaland with respect to management."** is rejected.

3. Mean score of class 9^{th} secondary students is 39.38 and the mean score of class 10^{th} secondary students is 39.25. The standard deviation (SD) of 9^{th} secondary students is 5.173 and that of 10^{th} secondary students is 4.984 [**table no. 4.4(3**)].

Table no. 4.4(3) it can be seen that the p-value is 0.71 (P>0.05) which is more than 0.05 and t-value is 0.38 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in metacognitive experience of secondary school students in Dimapur district of Nagaland with respect to class",** is accepted.

4. Mean score of CBSE secondary students is 39.33 and the mean score of NBSE secondary students is 39.30. The standard deviation (SD) of CBSE secondary students is 5.353 and that of NBSE secondary students is 4.927[**table no. 4.4(4**)].

Table no. 4.4(4) it can be seen that the p-value is 0.94 (P>0.05) which is more than 0.05 and t-value is 0.08 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in metacognitive experience of secondary school students in Dimapur district of Nagaland with respect to board"** is accepted.

4.3 OBJECTIVE 2: TO STUDY THE USAGE OF MOBILE PHONE OF SECONDARY SCHOOL STUDENTS IN DIMAPUR DISTRICT OF NAGALAND WITH RESPECT TO GENDER, TYPE OF MANAGEMENT, CLASS AND BOARD

Research question 2: What is the status of usage of mobile phone of secondary school students in Dimapur district of Nagaland?

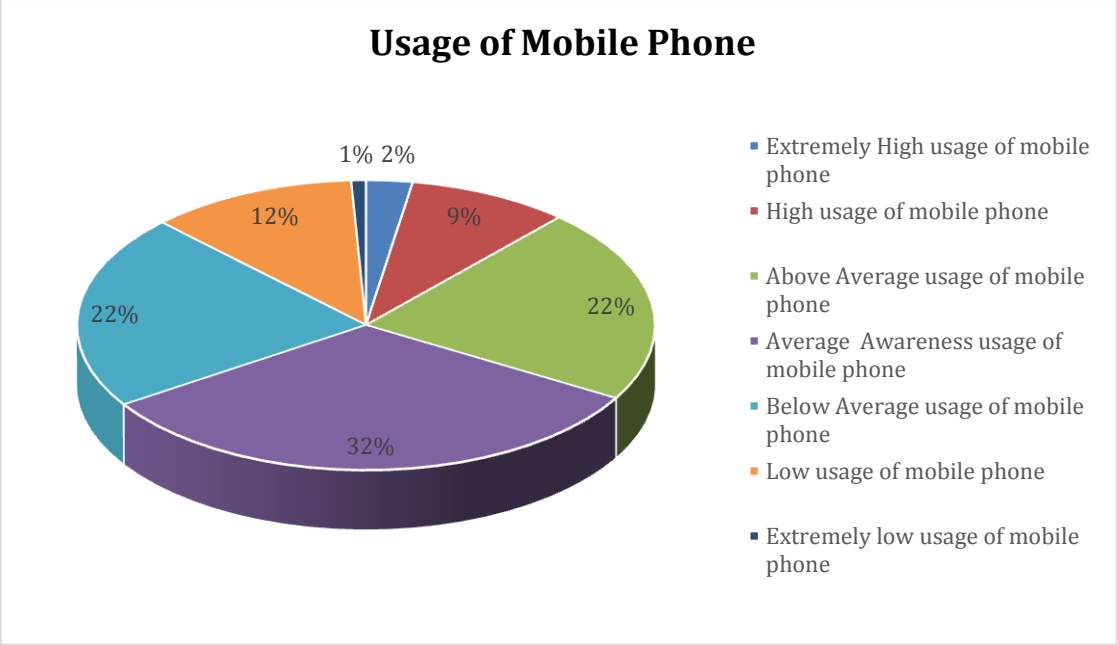


Fig 4.5: Graphical representation showing status of usage of mobile phone of secondary school students in Dimapur district of Nagaland

fig 4.5 clearly indicates that only 2% students having extremely high usage of mobile phone, 9% students having high usage of mobile phone, 22% students having above average usage of mobile phone, 32% students having average usage of mobile phone, 22% students having below average usage of mobile phone, 12% students having low usage of mobile phone and 1% of students having extremely low usage of mobile phone. Sundari (2015) reported that the frequent use of mobile phones sometimes disturbed their learning process of the adults and there is a significant association between living status of respondents and the learning skills acquired by the use of mobile phone. The percentage has been taken out on the basis of z-score which has been calculated by the researcher for each individual in the sample.

Hypothesis-2: There is no significant difference in the usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

In order to find the significant difference of dimension and categorical variables, the data has been analyzed and interpreted using descriptive statistics such as mean, standard deviation and the above hypothesis is tested by employing 't' test. The value of 't' critical was set at 1.96 for the 0.05 level of significance with df=398. It is presented in table below:

Table No. 4.5: Usage of mobile phone in Dimapur district of Nagaland with respect to gender, type of management, class, and board

Dimension and its Variables			N	Mean	SD	t Stat	P(T<=t) two-tail	Significant/ not Significant at 0.05/0.01
Usage of Mobile phone	1.Gender	Girl	451	38.63	8.017	-1.42	0.16	Not significant
		Boy	399	39.38	7.512			
	2.Type of Management	Government	307	38.63	7.712	-1.00	0.32	Not significant
		Private	543	39.18	7.832			
	3.Class	9^{th}	451	38.49	7.911	-1.96	0.05	Significant
		10^{th}	399	39.54	7.911			
	4.Board	CBSE	309	40.02	7.680	2.97	0.00	Significant
		NBSE	541	38.39	7.795			

Note: t critical for 398 df at 0.05 level of significance=1.96

1. Mean score of usage of mobile phone of girl secondary students is 38.63 and the mean score of boy secondary students is 39.38. The standard deviation (SD) of girl secondary students is 8.017 and that of boy secondary students is 7.512 [**table no. 5(1)**].

Table no. 4.5 (1) it can be seen that the p-value is 0.16 (P>0.05) which is more than 0.05 and the t-value is -1.42 which is less than the t critical value (1.96). Based on the finding, the null hypothesis, **"There is no significant difference in the usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender"** is accepted**.** Resonance with the study by Rani & Deswal (2019) which found that there is significant difference between mean scores of mobile phone usage of male and female senior secondary school students. In contrast, a study by Negi & Godiyal (2019) revealed that the male and female undergraduate students differ significantly in their time spend on mobile phone per day.

2. Mean score of usage of mobile phone of government secondary students is 38.63 and the mean score of private secondary students is 39.18. The standard deviation (SD) of government secondary students is 7.712 and that of private secondary students is 7.8.32 [**table no.4.5(2)].**

Table no. 4.5(2) it can be seen that the p-value is 0.32 (P>0.05) which is more than 0.05 and the t-value is -1.00 which is less than the t critical value (1.96). Thus, the null hypothesis, "**There is no significant difference in the usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to type of management,"** is accepted. Similar study by Rani and Singh (2019) found that no significant difference between the mean scores of mobile phone usage among senior secondary school students of Government and Non- Government Schools.

3. Mean score of usage of mobile phone of class 9^{th} secondary students is 38.49 and the mean score of class 10^{th} secondary students is 39.54. The standard deviation (SD) of 9^{th} secondary students is 7.911 and that of 10^{th} secondary students is 7.620 **[Table no.4.5(3)]**.

Table no. 4.5(3) it can be seen that the p-value is 0.05 (P=0.05) which is equal to 0.05 and the t-value is -1.96 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in the level of usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to class,"** is rejected.

4. Mean score of usage of mobile phone of CBSE secondary students is 40.02 and the mean score of NBSE secondary students is 38.39. The standard deviation (SD) of CBSE and NBSE secondary students are 7.680 and 7.795, respectively [**table no.4.5(4**)].

T**able no. 4.5(4)** it can be seen that the p-value is 0.00 (P<0.05) which is less than 0.05 and the t-value is 2.97 which is greater than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in the level of usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to board**," is rejected.

Research question 2.1: What is the level of interest in the usage of mobile phone of secondary school students in Dimapur district of Nagaland?

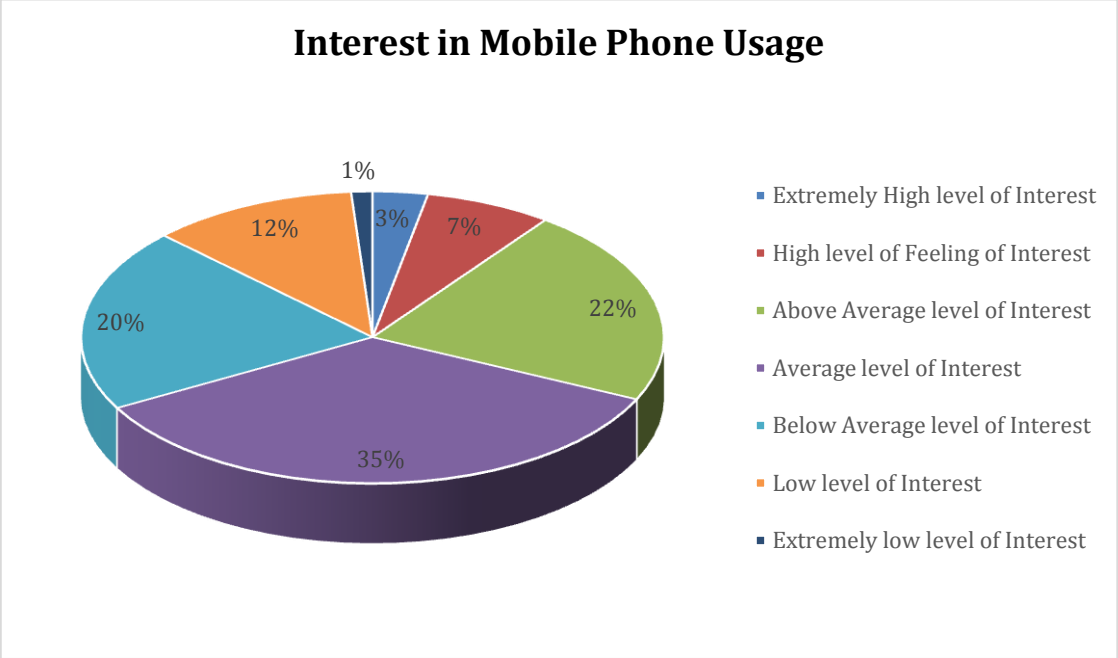


Fig 4.6: **Graphical representation showing level of interest in the usage of mobile phone of secondary school students in Dimapur district of Nagaland**

fig 4.6 clearly indicates that only 3% students having extremely high interest in the usage of mobile phone, 7% students having high interest in the usage of mobile phone, 22% students having above average interest in the usage of mobile phone, 35% students having average interest in the usage of mobile phone, 20% students having below average interest in the usage of mobile phone, 12% students having low interest in the usage of mobile phone, and 1% of students having extremely low interest in the usage of mobile phone. The percentage has been taken out on the basis of **z-score** which has been calculated by the researcher for each individual in the sample.

Hypothesis 2.1: There is no significant difference in interest for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

Table No. 4.6: Interest for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

Major Dimension and its Variables			N	Mean	SD	t Stat	P(T<=t) two-tail	Significant / not Significant at 0.05/0.01
Interest for usage of mobile phone	1.Gender	Girl	451	25.07	6.200	-1.32	0.19	Not significant
		Boy	399	25.63	5.979			
	2.Type of Management	Government	307	24.65	6.121	-2.45	0.01	Significant
		Private	543	25.72	6.060			
	3.Class	9^{th}	451	24.95	6.202	-1.96	0.05	Significant
		10^{th}	399	25.77	5.961			
	4.Board	CBSE	309	26.48	6.093	4.15	0.00	Significant
		NBSE	541	24.68	6.013			

Note: t critical for 398 df at 0.05 level of significance=1.96

1. Mean score of girl secondary students is 25.07 and the mean score of boy secondary students is 25.63. The standard deviation (SD) of Girl secondary students is 6.200 and that of Boy secondary students is 5.979 [**table no 4.6(1**)].

Table no. 4.6(1) it can be seen that the p-value is 0.19 (P>0.05) which is more than 0.05 and the t-value is -1.32 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in interest for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender,"** is accepted.

2. Mean score of government secondary students is 24.65 and the mean score of private secondary students is 25.72. The standard deviation (SD) of government secondary students is 6.121 and that of private secondary students is 6.060 [**table no 4.6(2**)].

Table no. 4.6(2) it can be seen that the p-value is 0.01 (P<0.05) which is less than 0.05 and the t-value is -2.45 which is less than the t-critical value (1.96). Thus, the null hypothesis, "**There is no significant difference in interest for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to management,**" is rejected.

3. Mean score of class 9th secondary students is 24.95 and the mean score of class 10th secondary students is 25.77. The standard deviation (SD) of 9th secondary students is 6.202 and that of 10th secondary students is 5.961 [**table no 4.6(3)**].

T**able no. 4.6 (3)** can be seen that the p-value is 0.05 (P=0.05) which is equal to 0.05 and the t-value is -1.976 which is less than the critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in interest for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to class,"** is rejected.

4. Mean score of CBSE secondary students is 26.48 and the mean score of NBSE secondary students is 24.68. The standard deviation (SD) of CBSE secondary students is 6.093 and that of NBSE secondary students is 6.013 [**table no. 4.6(4)**].

Table no. 4.6(4) it can be seen that the p-value is 0.00 (P<0.05) which is less than 0.05 and the t-value is 4.15 which is greater than the table value (1.96). Thus, the null hypothesis, **"There is no significant difference in interest for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to board,"** is rejected.

Research question 2.2: What is the status of time spent on the mobile phone of secondary school students in the Dimapur district of Nagaland?

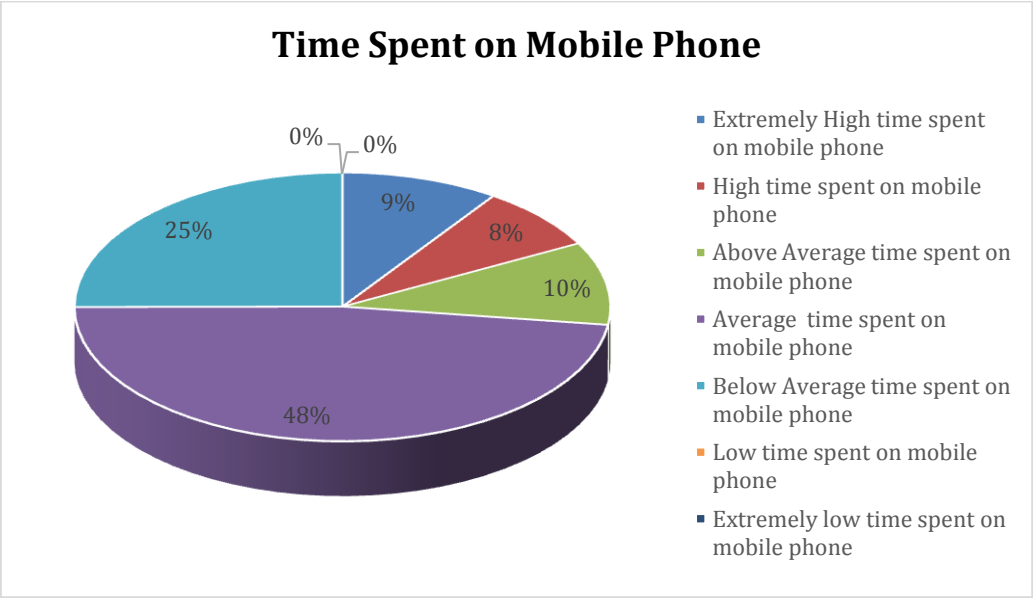


Fig 4.7: **Graphical representation showing status of time spent on the mobile phone of secondary school students in Dimapur district of Nagaland**

fig 4.7 clearly indicates that only 9% students having extremely high status of time spent on the mobile phone, 8% students having high status of time spent on the mobile phone, 10% students having above average status of time spent on the mobile phone, 48% students having average status of time spent on the mobile phone, 25% students having below average status of time spent on the mobile phone, 0% students having low status of time spent on the mobile phone and 0% of students having extremely low interest in the usage of mobile phone. A study by Negi & Godiyal (2019) found that most of students were not spending more time on mobile phones, only very few students like to spend time on mobile phones instead of studies. The percentage has been taken out on the basis of **z-score** which has been calculated by the researcher for each individual in the sample.

Hypothesis 2.2: There is no significant difference in the time spent for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

Table No. 4.7: Time spent for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

Major Dimension and its Variables			N	Mean	SD	t Stat	P (T<=t) two-tail	Significant/ not Significant at 0.05/0.01
Time spent for usage of mobile phone	1.Gender	Girl	451	5.06	2.062	0.18	0.85	Not significant
		Boy	399	5.03	1.937			
	2.Type of Management	Government	307	5.03	2.183	-0.15	0.88	Not significant
		Private	543	5.05	1.896			
	3.Class	9^{th}	451	5.02	2.131	-0.40	0.69	Not significant
		10^{th}	399	5.07	1.851			
	4.Board	CBSE	309	4.89	1.987	-1.70	0.09	Not significant
		NBSE	541	5.13	2.009			

Note: t critical for 398 df at 0.05 level of significance=1.96

1. Mean score of girl secondary students is 5.06 and the mean score of boy secondary students is 5.03. The standard deviation (SD) of girl secondary students is 2.062 and that of boy secondary students is 1.937 [**table no 4.7(1**)].

Table no. 4.7(1) it can be seen that the p-value is 0.85 (P>0.05) which is more than 0.05 and the t-value is 1.18 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in time spent for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender,"** is accepted. In contrast, a study by Negi & Godiyal (2019) revealed that male undergraduate students have been found spending more time on mobile phone (per day) as compared to female students.

2. Mean score of government secondary students is 5.03 and the mean score of private secondary students is 5.05. The standard deviation (SD) of government secondary students is 2.183 and that of private secondary students is 1.896 [**table no 4.7(2**)].

Table no. 4.7(2) it shows that the p-value is 0.88 (P>0.05) which is more than 0.05 and the t-value is -0.15 which is less than the t critical value (1.96). Thus, the null hypothesis **"There is no significant difference in time spent for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to type management,"** is accepted.

3. Mean score of class 9^{th} secondary students is 5.02 and the mean score of class 10^{th} secondary students is 5.07. The standard deviation (SD) of 9^{th} secondary students is 2.131 and that of 10^{th} secondary students is 1.851 [**table no 4.7(3)**].

Table no. 4.7(3) it can be seen that the p-value is 0.69 (P>0.05) which is more than 0.05 and the t-value is -0.40 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in time spent for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to class,"** is accepted.

4. Mean score of CBSE secondary students is 4.89 and the mean score of NBSE secondary students is 5.13. The standard deviation (SD) of CBSE secondary students is 1.987 and that of NBSE secondary students is 2.009 [**table no 4.7(4**)].

Table no. 4.7(4) it can be seen that the p-value is 0.09 (P>0.05) which is more than 0.05 and the t-value is -1.70 which is less than the t critical value (1.96). Thus, the null

hypothesis, **"There is no significant difference in time spent for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to board of school,"** is accepted.

Research question 2.3: What is the status of the usage of mobile phone for entertainment purposes of secondary school students in Dimapur district of Nagaland?

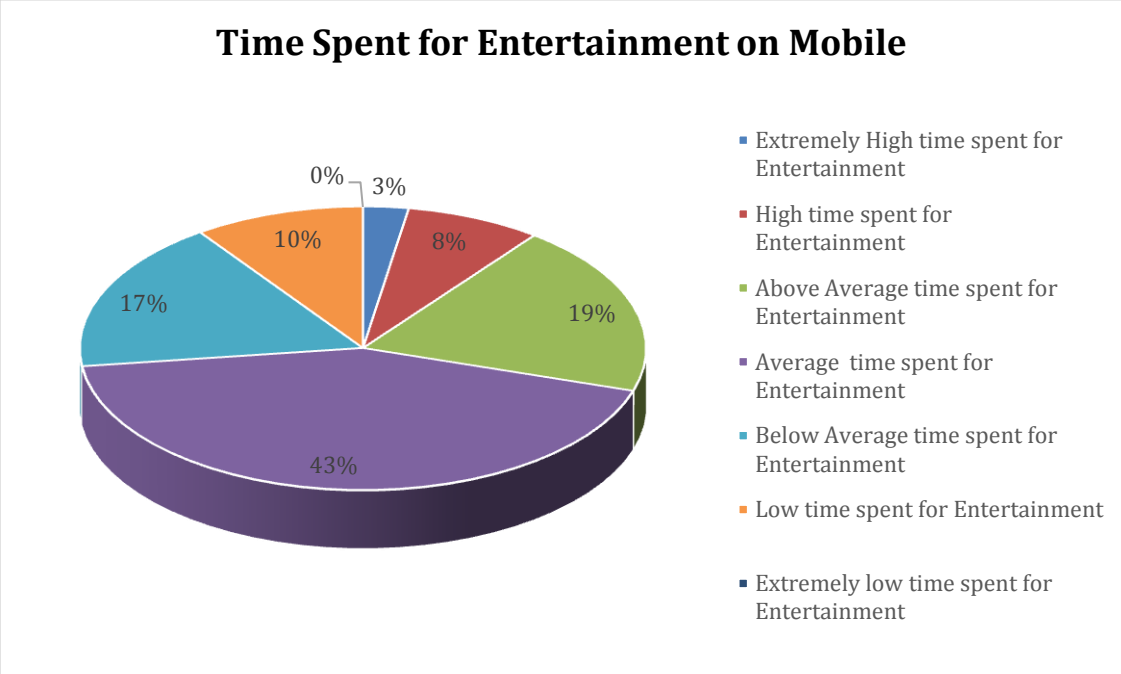


Fig 4.8: **Graphical representation showing status of the usage of mobile phone for entertainment purposes of secondary school students in Dimapur district of Nagaland.**

fig 4.8 clearly indicates that only 3% students having extremely high status of the usage of mobile phone for entertainment purposes, 8% students having high status of the usage of mobile phone for entertainment purposes, 19% students having above average status of the usage of mobile phone for entertainment purposes, 43% students having average status of the usage of mobile phone for entertainment purposes, 17% students having below average status of the usage of mobile phone for entertainment purposes, 10% students having low status of the usage of mobile phone for entertainment purposes, and 0% of students having extremely low status of the usage of mobile phone for entertainment purposes. The percentage has been taken out on the

basis of **z-score** which has been calculated by the researcher for each individual in the sample.

Hypothesis 2.3: There is no significant difference in the usage of mobile phone for entertainment purpose of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

Table no. 4.8: Usage of mobile phone for entertainment purpose of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

Major Dimension and its Variables			N	Mean	SD	t Stat	P (T<=t) two-tail	Significant/ not Significant at 0.05/0.01
Usage of mobile phone for entertainment purpose	1.Gender	Girl	451	8.50	2.922	-1.14	0.26	Not significant
		Boy	399	8.73	2.963			
	2.Type of Management	Government	307	8.95	2.981	2.55	0.01	Significant
		Private	543	8.41	2.904			
	3.Class	9^{th}	451	8.52	2.957	-0.86	0.38	Not significant
		10^{th}	399	8.70	2.926			
	4.Board	CBSE	309	8.66	2.939	0.30	0.70	Not significant
		NBSE	541	8.57	2.946			

Note: t critical for 398 df at 0.05 level of significance=1.96

1. Mean score of usage of mobile phone for entertainment purpose of girl secondary students is 8.50 and the mean score of boy secondary students is 8.73. The standard deviation (SD) of girl secondary students is 2.922 and that of boy secondary students is 2.963 [**table no 4.8(1**).

Table no. 4.8(1) it can be seen that the p-value is 0.26 (P>0.05) which is more than 0.05 and the t-value is -1.14 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in usage of mobile phone for**

entertainment purpose of secondary school students in Dimapur district of Nagaland with respect to gender," is accepted.

2. Mean score of government secondary students is 8.95 and the mean scores of private secondary students is 8.41. The standard deviation (SD) of government secondary students is 2.981 and that of private secondary students is 2.904 [**table no 4.8(2**)].

Table no. 4.8(2) it shows that the p-value is 0.01 (P<0.05) which is much lesser than 0.05 and the t-value is 2.55 which is greater than the t critical value (1.96). Thus, the null hypothesis, "**There is no significant difference in usage of mobile phone for entertainment purpose of secondary school students in Dimapur district of Nagaland with respect to type of management,"** is rejected.

3. Mean score of class 9^{th} secondary students is 8.52 and the mean score of class 10^{th} secondary students is 8.70. The standard deviation (SD) of 9^{th} secondary students is 2.957 and that of 10^{th} secondary students is 2.926 **[table no 4.8(3)].**
From **table no. 4.8** it shows that the p-value is 0.38 (P>0.05) which is more than 0.05 and the t-value is -0.86 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in usage of mobile phone for entertainment purpose of secondary school students in Dimapur district of Nagaland with respect to class,"** is accepted.

4. Mean score of CBSE secondary students is 8.66 and the mean score of NBSE secondary students are 8.57. The standard deviation (SD) of CBSE secondary students is 2.939 and that of NBSE secondary students is 2.946 [**Table no. 4.8(4**)].
Table no. 4.8(4) can be seen that the p-value is 0.70 (P>0.05) which is more than 0.05 and the t-value is 0.39 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in usage of mobile phone for entertainment purpose of secondary school students in Dimapur district of Nagaland with respect to board of school,"** is accepted.

Analysis based on simple Percentage

Research question 2.4: How much time do the students spend on mobile phone daily?

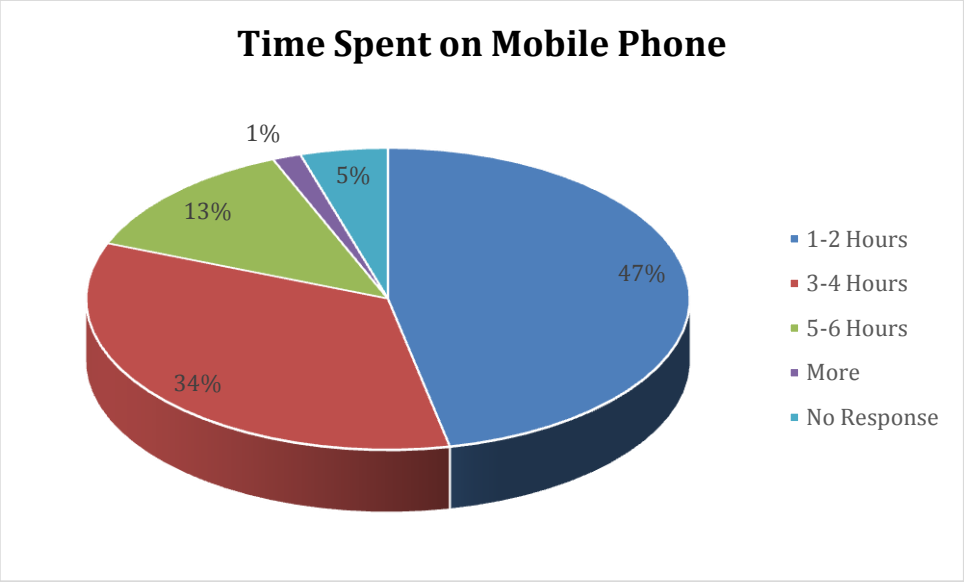


Fig 4.9: **Graphical representation showing time spent on mobile phone of secondary school students in Dimapur district of Nagaland**

Fig 4.9 clearly indicates that 47% students spent 1-2 hours time on mobile phone, 34% students spent 3-4 hours time on mobile phone, 13% students spent 5-6 hours time on mobile phone, 1% students spent more than 6 hours time on mobile phone, and 5% students did not response.

Research question 2.5: For what purpose most of the students are using mobile phone?

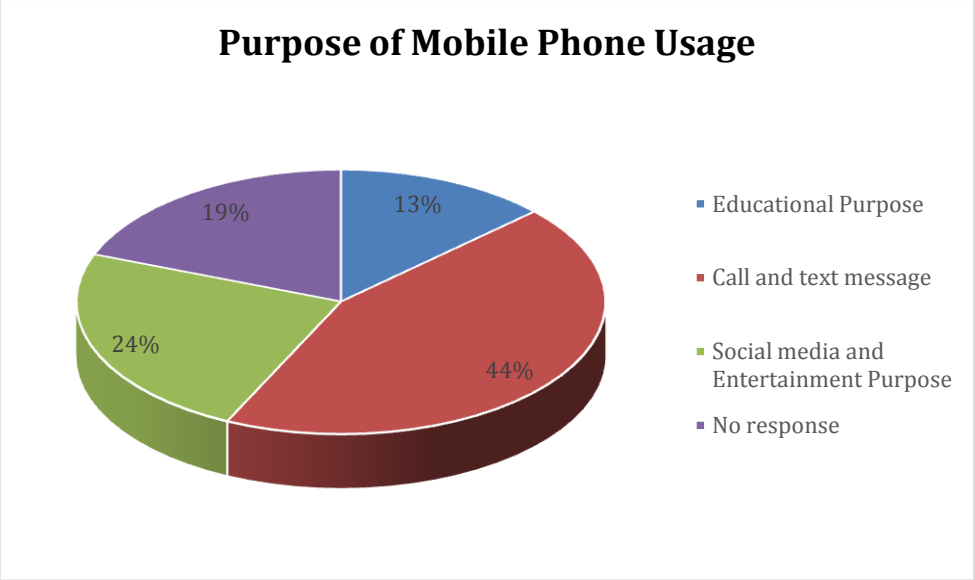


Fig 4.10: **Graphical representation showing purpose of usage of mobile phone of secondary school students in Dimapur district of Nagaland**

Fig 4.10 clearly indicates that 13% students use mobile phone for educational purpose, 44% students use mobile phone for call and text message purpose, 24% students use mobile phone for social media and entertainment purpose, and 19% students did not response.

Research question 2.6: At what age did the students open their social media account?

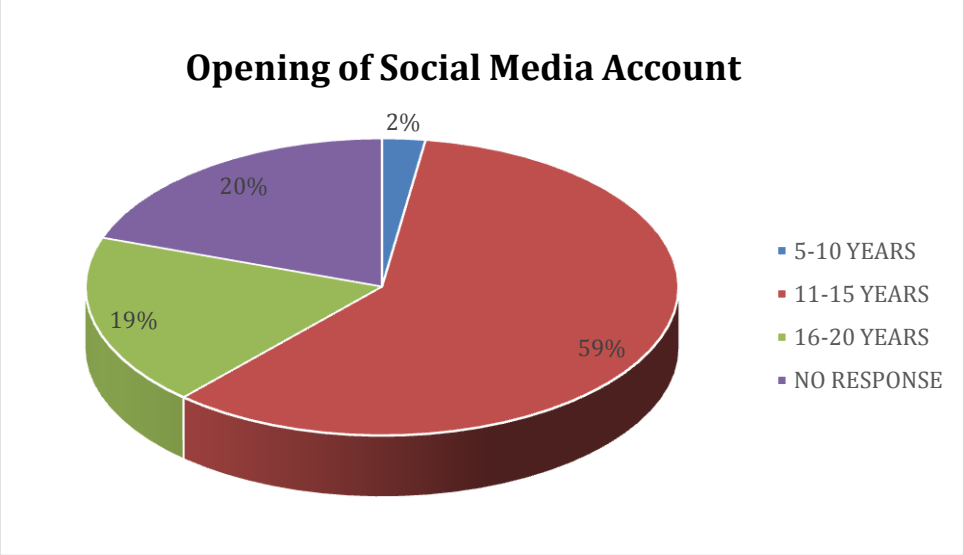


Fig 4.11: **Graphical representation showing age of opening social media account of secondary school students in Dimapur district of Nagaland**

Fig 4.11 clearly indicates that 2% of students have started using social media at the age of 5-10 years, 59% of students have started using social media at the age of 11-15 years,

19% of students have started using social media at the age of 16-20 years and 20% students did not response.

Research question 2.7. How much time daily do the students spend on social media?

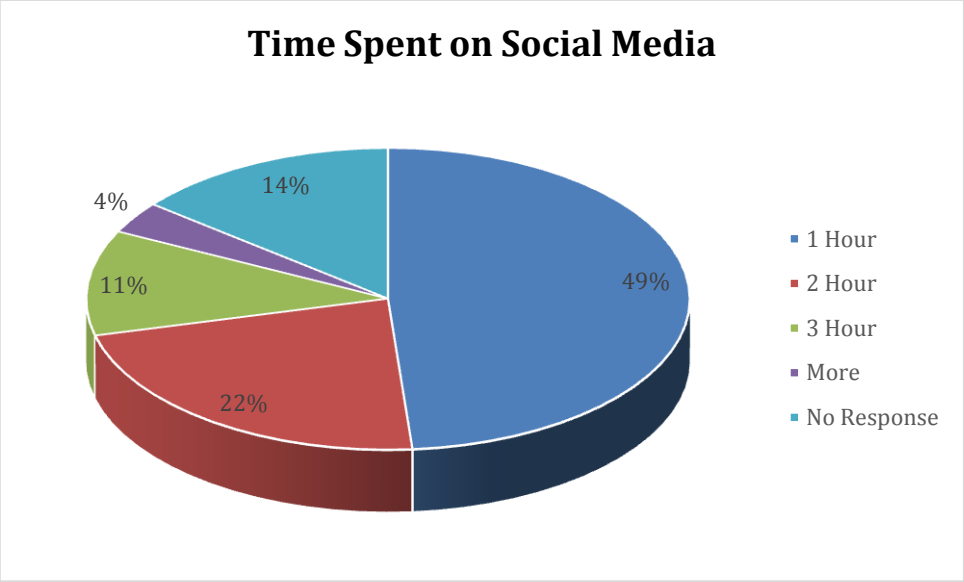


Fig 4.12: **Graphical representation showing time spent on social media of secondary school students in Dimapur district of Nagaland**

Fig 4.12 clearly indicates that 49% spent 1 hour on social media, 22% spent 2 hours on social media, 11% spent 3 hours on social media, 4% spent more than 3 hours on social media, and 14 % students did not response.

Research question 2.8: What do the students prefer to do in their leisure time?

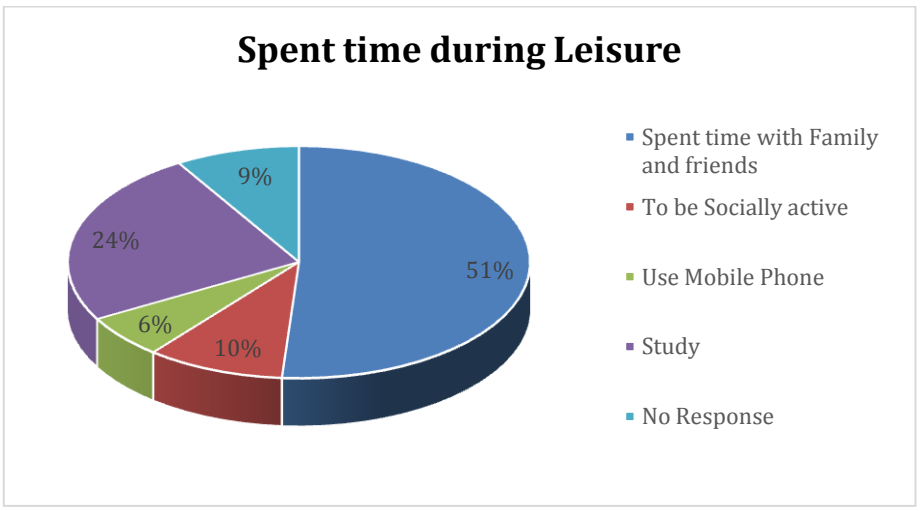


Fig 4.13: **Graphical representation showing time spent during leisure hour for secondary school students in Dimapur district of Nagaland**

Fig 4.13 clearly indicates that 51% students spent time with family and friends during leisure time, 10% students wanted to be socially active during leisure time, 6% students spent time using mobile phone during leisure time, 24% spent on study during leisure time and 9 % students did not response.

Research question 2.9: Does the students play online games on their mobile phone?

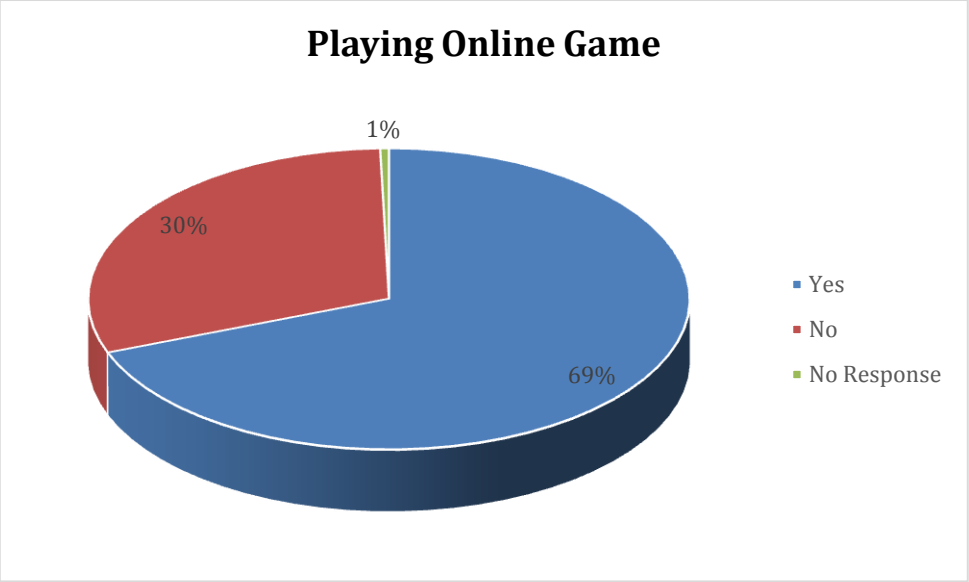


Fig 4.14: **Graphical representation showing playing online games for secondary school students in Dimapur district of Nagaland**

Fig 4.14 clearly indicates that 69% students play online game, 30% students does not play online game, and 1% students did not response.

Research question 2.10 How many mobile games App the students have on their mobile?

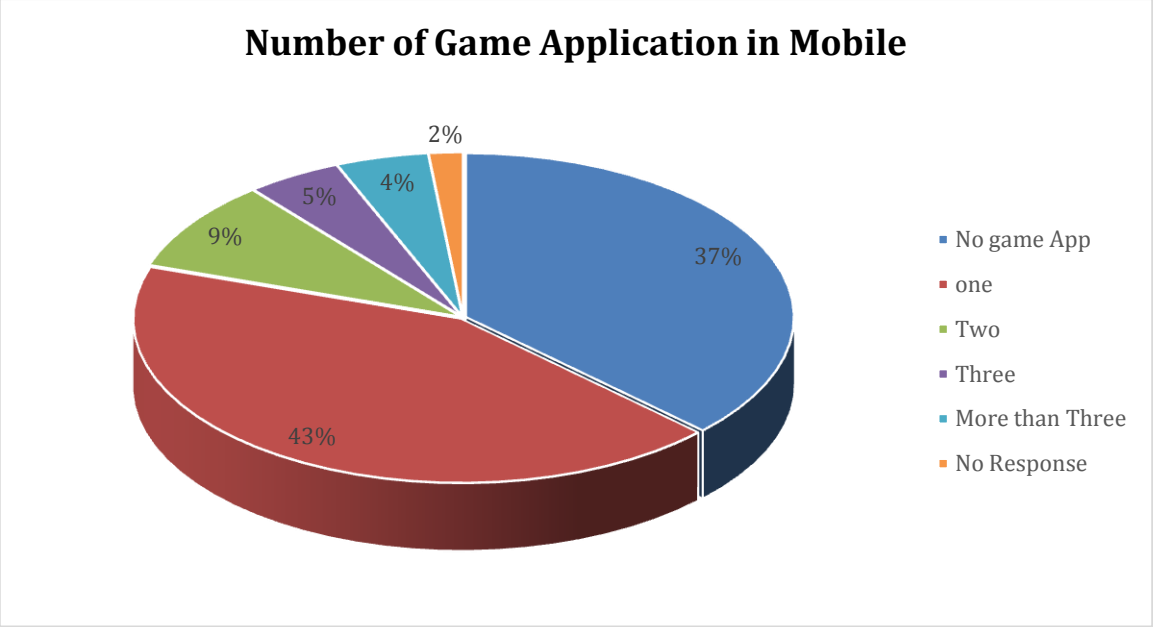


Fig 4.15: Graphical representation showing the number of mobile game apps in mobile phone of the secondary school students in the Dimapur district of Nagaland.

Fig 4.15 clearly indicates that 37% students have no game app, 43% students have one (1) mobile game apps, 9% students have two (2) mobile game apps, 5% students have three (3) mobile game apps, 4% students have more than 3mobile game apps and 2 % students did not response.

Research question 2.11 How much time do the students spend daily playing games on mobile phone?

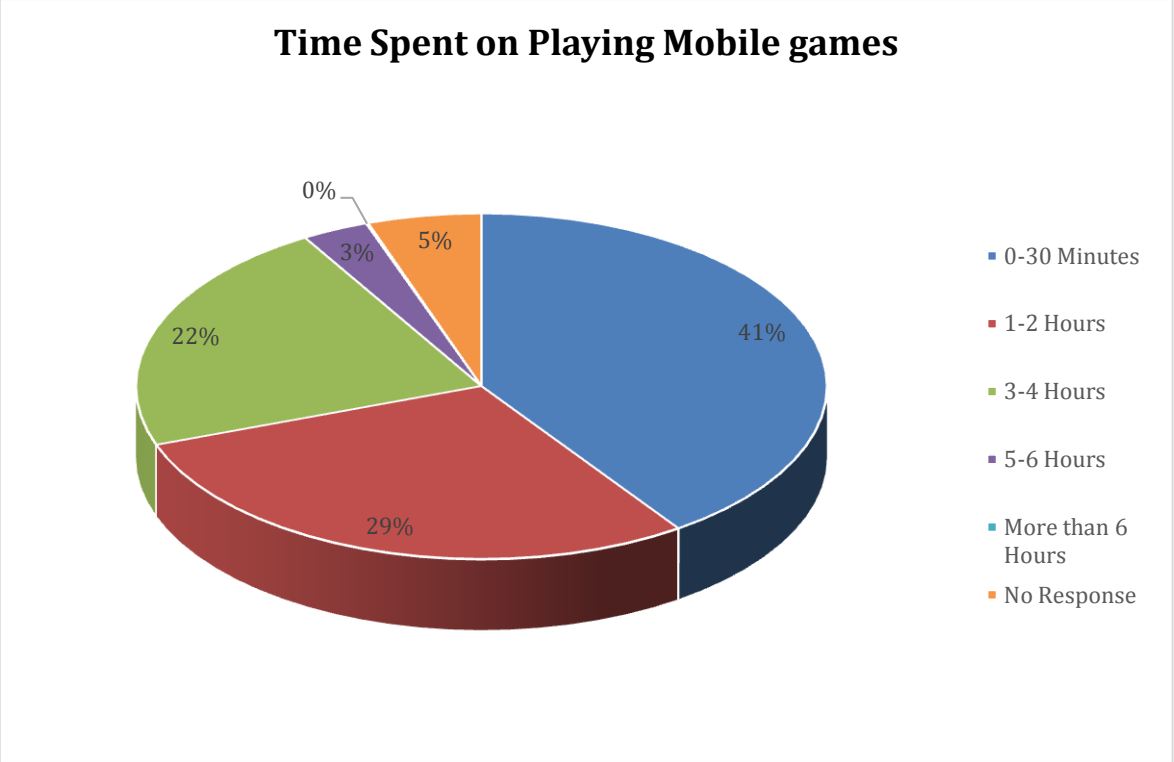


Fig 4.16: **Graphical representation showing time spent on playing mobile game for the secondary school students in the Dimapur district of Nagaland.**

Fig 4.16 clearly indicates that 41% students time spent (0-30 minutes) on playing mobile game, 29% students time spent (1-2 hours) on playing mobile game, 22% students time spent (3-4 hours) on playing mobile game, 3% students time spent (5-6 hours) on playing mobile game mobile phone, 0% students time spent (more than 6 hours) on playing mobile game mobile phone and 5% students did not respond.

2.12 With whom do the students usually play mobile game?

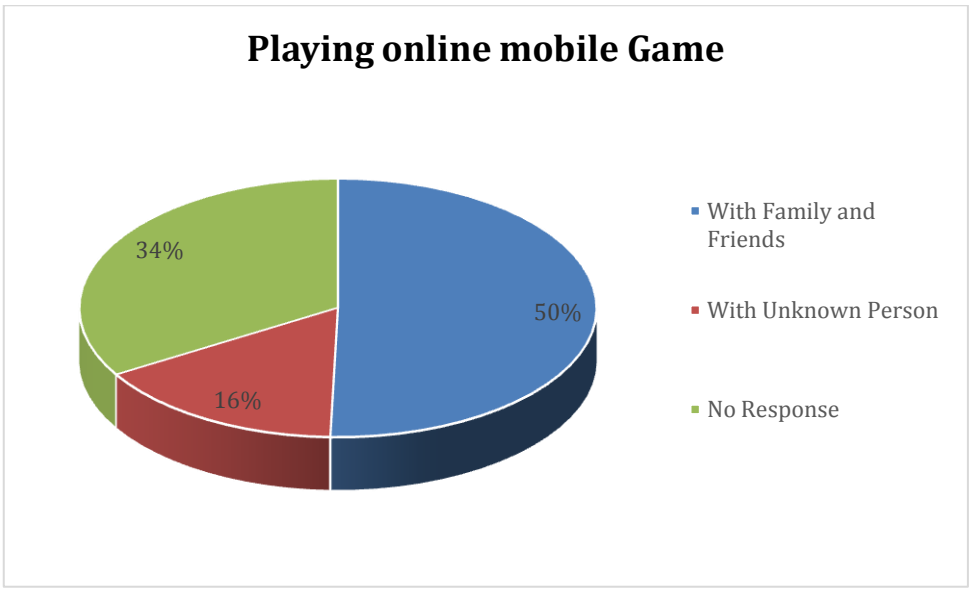


Fig 4.17: Graphical representation showing students with the person they usually play mobile online games of the secondary school students in the Dimapur district of Nagaland.

Fig 4.17 clearly indicates that 50% students play online mobile game with family and friends, 16% students play mobile online game with unknown person, and 34% students did not response.

Research question 2.13 for what purpose the students are using YouTube?

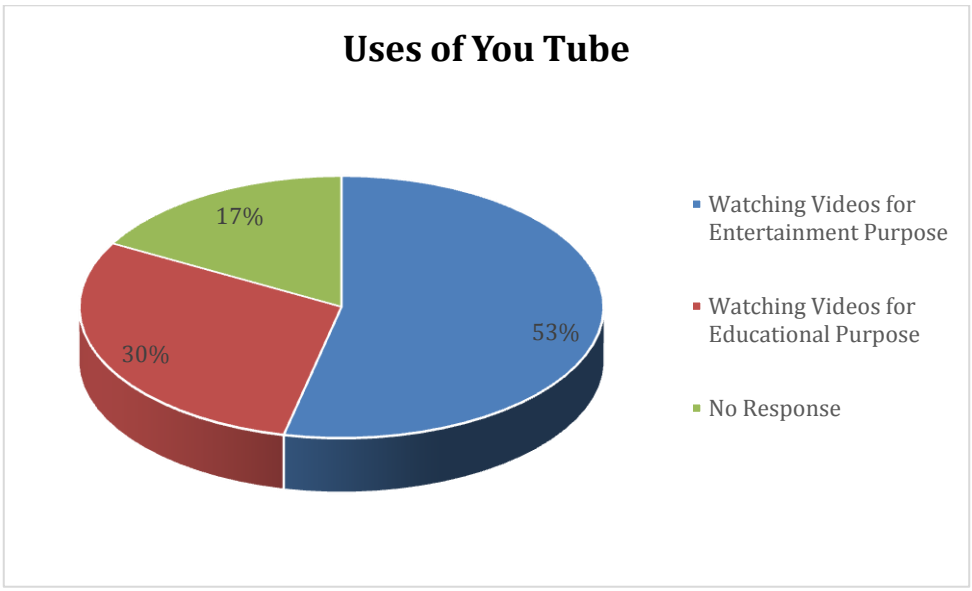


Fig 4.18: Graphical representation showing uses of YouTube for the secondary school students in the Dimapur district of Nagaland

Fig 4.18 clearly indicates that 53% students use YouTube for watching videos for entertainment purpose, 30% students use YouTube for watching videos for educational purpose, and 17% students did not response.

2.14 How much time does the students spend daily watching videos/ movies on the mobile phone?

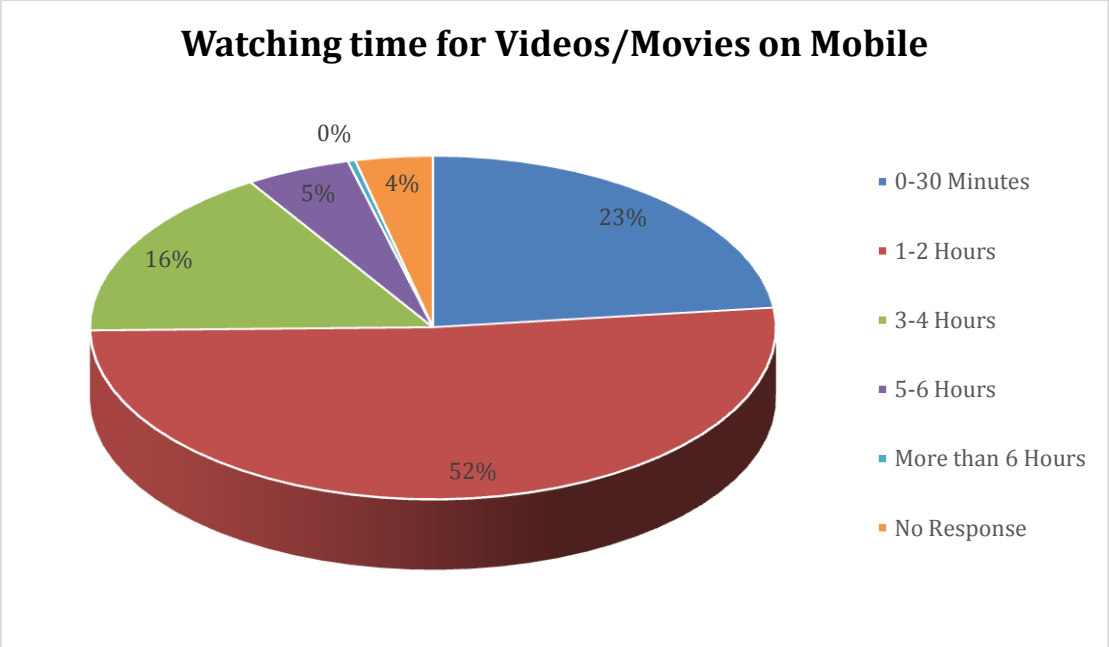


Fig 4.19: Graphical representation showing spend daily watching videos/ movies on the mobile phone of the secondary school students in the Dimapur district of Nagaland.

Fig 4.19 clearly indicates that 23% spent (0-30 minutes) daily watching videos/ movies on the mobile phone, 52% spent (1-2 hours) daily watching videos/ movies on the mobile phone, 16% spent (3-4 hours) daily watching videos/movies on the mobile phone**,** 5% spent (5-6 hours) daily watching videos/ movies on the mobile phone, 0% spent (more than 6 hours) daily watching videos/ movies on the mobile phone, and 4% students did not response.

2.15 How often do the students check their mobile phone?

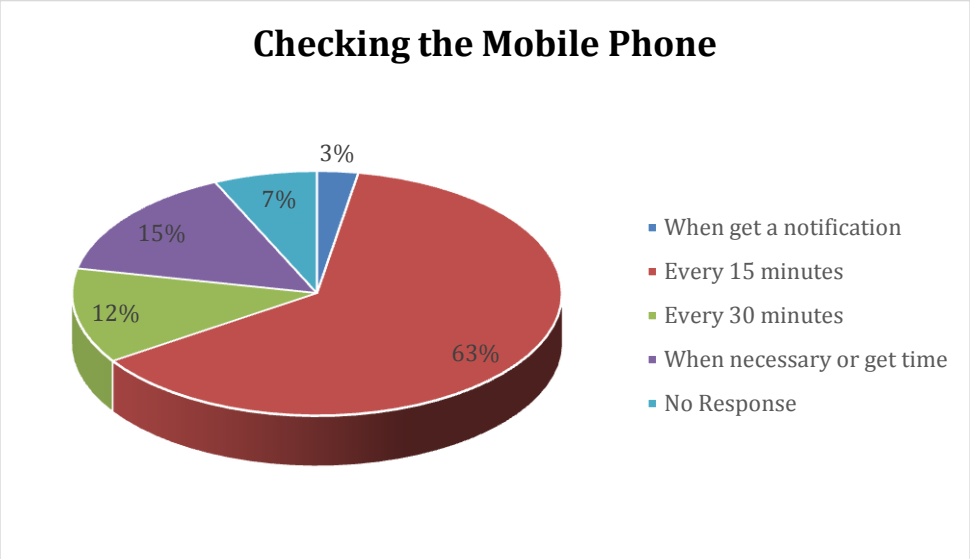


Fig 4.20: Graphical representation showing how often students check their mobile phone of secondary school students in the Dimapur district of Nagaland.

Fig 4.20 clearly indicates that 3% students check their mobile phone when they get a notification, 63% students check their mobile phone every 15 minutes, 12% students check their mobile phone every 30 minutes, 15**%** students check their mobile phone when necessary or get time, and 7% students did not response.

4.4 OBJECTIVE 3: TO STUDY THE AWARENESS ABOUT THE USAGE OF MOBILE PHONE OF SECONDARY SCHOOL STUDENTS IN DIMAPUR DISTRICT OF NAGALAND WITH RESPECT TO GENDER, TYPE OF MANAGEMENT, CLASS AND BOARD

Research question 3: What is the level of awareness about usage of mobile phone of secondary school students in Dimapur district of Nagaland?

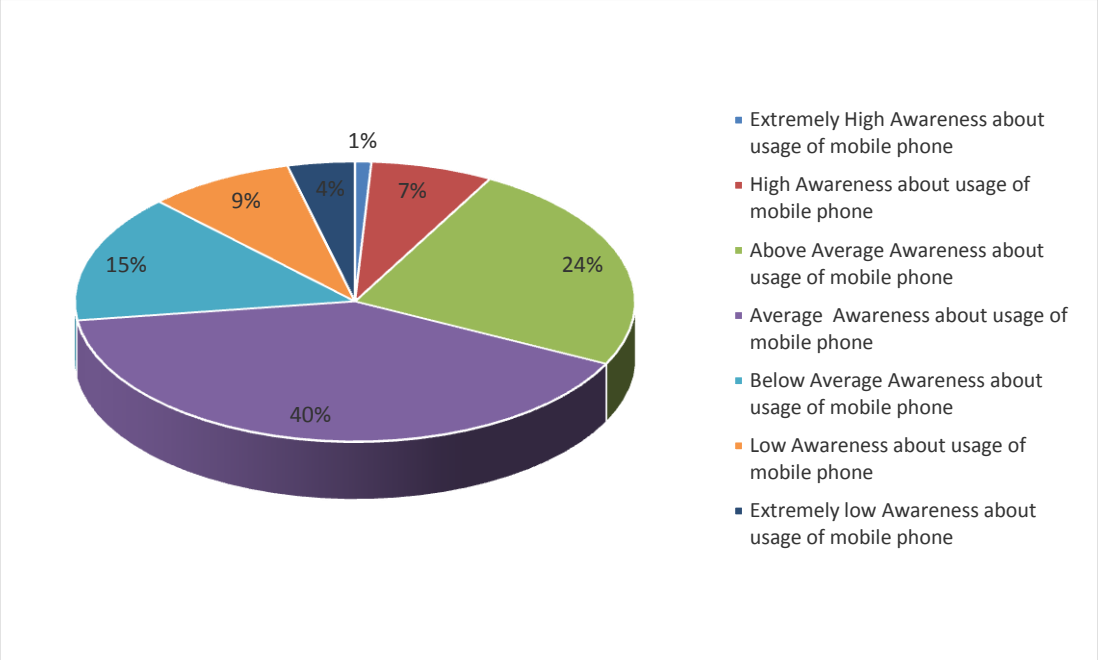


Fig 4.21: Graphical representation showing level of awareness about usage of mobile phone of secondary school students in Dimapur district of Nagaland

Fig 4.21 clearly indicates that only 1% of students having extremely high level of awareness about usage of mobile phone, 7% students having high level of awareness about usage of mobile phone, 24% students having above average level of awareness about usage of mobile phone, 40% students having average level of awareness about usage of mobile phone, 15% students having below average level of awareness about usage of mobile phone, 9% students having low level of awareness about usage of mobile phone, and 4% students having extremely low level of awareness about usage of mobile phone. The percentage has been taken out on the basis of **z-score** which has been calculated by the researcher for each individual in the sample.

Hypothesis 3: There is no significant difference in the awareness about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

Table no. 4.9: Awareness about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

Dimension and its Variables			N	Mean	SD	t Stat	P(T<=t) two-tail	Significant/ not Significant at 0.05/0.01
Awareness about usage of mobile phone	1.Gender	Girl	451	37.09	6.412	-0.33	0.74	Not significant
		Boy	399	37.24	6.555			
	2.Type of Management	Government	307	36.34	6.694	-2.73	0.01	Significant
		Private	543	37.62	6.310			
	3.Class	9^{th}	451	37.04	6.655	-0.57	0.57	Not significant
		10^{th}	399	37.29	6.274			
	4.Board of school	CBSE	309	38.04	6.071	3.08	0.00	Significant
		NBSE	541	36.66	6.550			

Note: t critical for 398 df at 0.05 level of significance=1.96

1. Mean score of awareness about usage of mobile phone of girl secondary students is 37.09 and the mean score of boy secondary students is 37.24. The standard deviation (SD) of girl secondary students is 6.412 and that of boy secondary students is 6.555 [**table no. 4.9(1**)].

Table no. 4.9(1) it can be seen that the p-value is 0.74 (P>0.05) which is more than 0.05 and the t-value is -0.33 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in the awareness about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender,"** is accepted

2. Mean score of level of awareness about usage of mobile phone of government secondary students is 36.34 and the mean score of private secondary students is 37.62. The standard deviation (SD) of Government secondary students is 6.694 and that of Private secondary students is 6.310 [**table no. 4.9(2**)].

Table no. 4.9(2) it can be seen that the p-value is 0.01 (P<0.05) which is less than 0.05 and the t-value is -2.73 which is less than the t critical value (1.96). Thus, the null hypothesis, "**There is no significant difference in the awareness about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to type of management,"** is rejected.

3. Mean score level of awareness about usage of mobile phone of class 9^{th} secondary students is 37.04 and the mean score of class 10^{th} secondary students is 37.29. The standard deviation (SD) of 9^{th} secondary students is 6.655 and that of 10^{th} secondary students is 6.274 [**table no. 4.9(3**)].

Table no. 4.9(3) it can be seen that the p-value is 0.57 (P>0.05) which is more than 0.05 and the t-value is -0.57 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in the awareness about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to class,"** is accepted.

4. Mean score level of awareness about usage of mobile phone of CBSE secondary school students is 38.04 and the mean score of NBSE secondary school students is 36.66. The standard deviation (SD) of CBSE secondary students is 6.071 and that of NBSE secondary students is 6.550 [**table no. 4.9(4**)].

Table no. 4.9(4) it can be seen that the p-value is 0.00 (P<0.05) which is less than 0.05 and the t-value is 3.08 which is greater than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in the awareness about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to board,"** is rejected. Hence, the results show that class NBSE secondary school students have higher awareness about usage of mobile phone as compared to CBSE secondary school students.

Research question 3.1: What is the level of awareness of usage of mobile phone for educational purpose of secondary school students in Dimapur district of Nagaland?

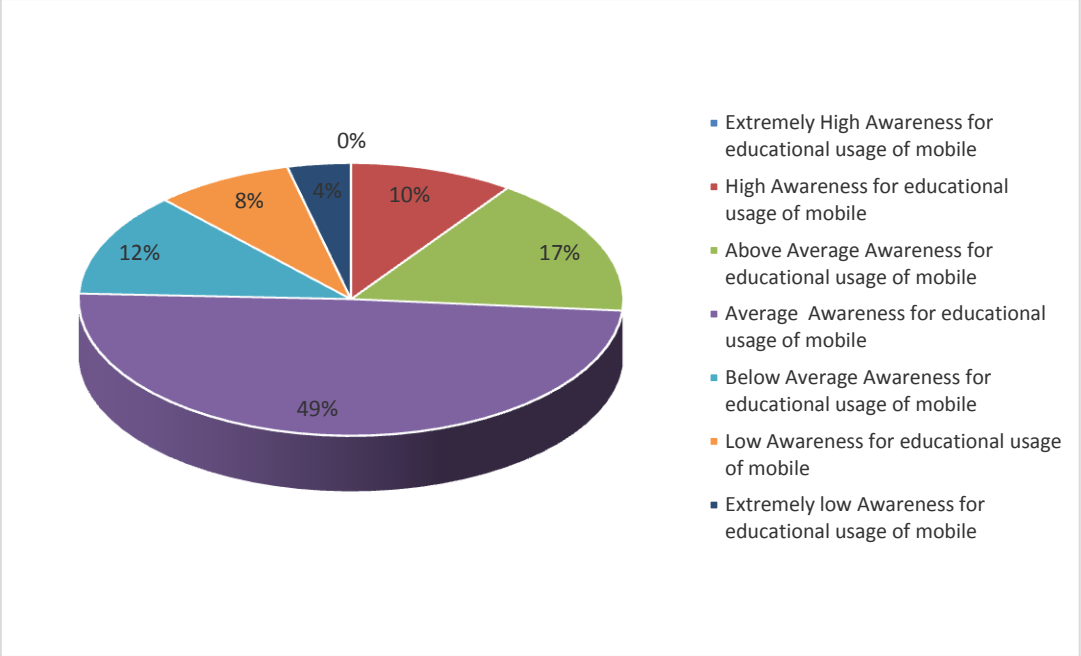


Fig 4.22: Graphical representation showing level of awareness of usage of mobile phone for educational purpose of secondary school students in Dimapur district of Nagaland

fig 4.22 clearly indicates that only 0% of students having extremely high awareness of usage of mobile phone for educational purpose, 10% students having high, 17% students having above average, 49% students having average, 12% students having below average, 8% students having low, and 4% students having extremely low awareness of usage of mobile phone for educational purpose. In line with these findings, a study by Biswas & Bhadra (2022) found that many do not know how to use a mobile phone for academic purposes, and some believe that mobile phones harm students because they break concentration during lessons. The percentage has been taken out on the basis of **z-score** which has been calculated by the researcher for each individual in the sample.

Hypothesis 3.1: There is no significant difference in the awareness (educational purpose) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

Table no. 4.10: Awareness (educational purpose) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

Major Dimension and its Variables			N	Mean	SD	t Stat	P(T<=t) two-tail	Significant/ not Significant at 0.05/0.01
Awareness (educational purpose)	1.Gender	Girl	451	15.33	3.288	-0.84	0.40	Not significant
		Boy	399	15.52	3.323			
	2.Type of Management	Government	307	15.03	3.349	-2.60	0.01	Significant
		Private	543	15.64	3.260			
	3.Class	9^{th}	451	15.16	3.277	-2.45	0.01	Significant
		10^{th}	399	15.72	3.313			
	4.Board of school	CBSE	309	16.04	3.137	4.20	0.00	Significant
		NBSE	541	15.07	3.348			

Note: t critical for 398 df at 0.05 level of significance=1.96

1. Mean score of girl secondary students is 15.33 and the mean score of boy secondary students is 15.52. The standard deviation (SD) of Girl secondary students is 3.288 and that of Boy secondary students is 3.323 [**table no. 4.10(1**)].

Table no. 4.10(1) it can be seen that the p-value is 0.40 (P>0.05) which is more than 0.05 and the t-value is -0.84 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in the awareness (educational purpose) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender,"** is accepted. Contrary to these findings, a study by Biswas and Bhadra (2022) showed that most female students are using the internet for study purposes, resulting in female students' results being better than male students.

2. Mean score of government secondary students is 15.03 and the mean score of private secondary students is 15.64. The standard deviation (SD) of government secondary students is 3.349 and that of private secondary students is 3.260 [**table no. 4.10(2**)].

Table no. 4.10(2) it can be seen that the p-value is 0.01 (P<0.05) which is less than 0.05 and the t-value is -2.60 which is less than the t critical value (1.96). Thus, the null hypothesis, "**There is no significant difference in the awareness (educational purpose) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to type of management,"** is rejected.

3. Mean score of class 9^{th} secondary students is 15.16 and the mean score of class 10^{th} secondary students is 15.72. The standard deviation (SD) of 9^{th} secondary students is 3.277 and that of 10^{th} secondary students is 3.313 [**table no. 4.10(3**)].

Table no. 4.10(3) it can be seen that the p-value is 0.01 (P<0.05) which is less than 0.05 and the t-value is -2.45 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in the awareness (educational purpose) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to class,"** is rejected.

4.Mean score of CBSE secondary students is 16.04 and the mean score of NBSE secondary students is 15.07. The standard deviation (SD) of CBSE secondary students is 3.137 and that of NBSE secondary students is 3.348 [**table no. 4.10(4**)].

Table no. 4.10(4) it can be seen that the p-value is 0.00 (P<0.05) which is less than 0.05 and the t-value is 4.20 which is greater than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in the awareness (educational purpose) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to board of school,"** is rejected.

Research question 3.2: What is the level of awareness of usage of mobile phone in relation to health problem of secondary school students in Dimapur district of Nagaland?

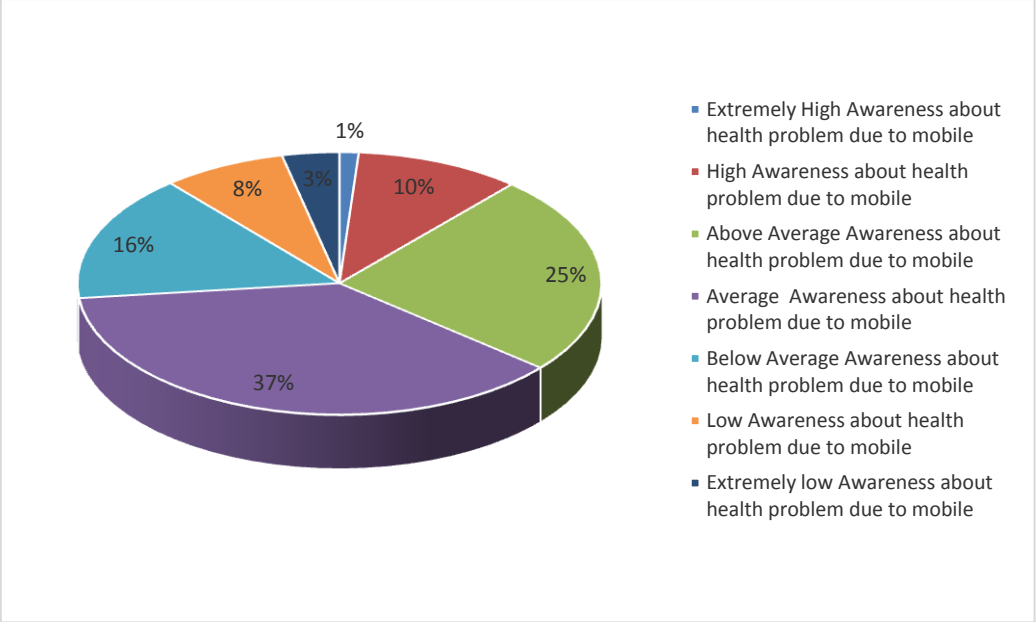


Fig 4.23: Graphical representation showing level of awareness of usage of mobile phone in relation to health problem of secondary school students in Dimapur district of Nagaland

Fig 4.23 clearly indicates that only 1% of students having extremely high awareness about using mobile in relation to health problem, 10% students having high, 25% students having above average, 37% students having average, 16% students having below average, 8% students having low, and 3% students having extremely low awareness about using mobile in relation to health problem. This finding is supported by Thomee et al. (2011) who found that high mobile phone use was correlated with sleep disturbances and signs of depression for men and women. The percentage has been taken out on the basis of z-score which has been calculated by the researcher for each individual in the sample.

Hypothesis 3.2: There is no significant difference in the awareness (health problem) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

Table no. 4.11: Awareness (health problem) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

Major Dimension and its Variables			N	Mean	SD	t Stat	P(T<=t) two-tail	Significant/ not Significant at 0.05/0.01
Awareness (health problem)	1.Gender	Girl	451	18.84	4.107	0.66	0.51	Not significant
		Boy	399	18.65	4.069			
	2.Type of Management	Government	307	18.59	4.408	-0.83	0.40	Not significant
		Private	543	18.84	3.896			
	3.Class	9^{th}	451	18.94	4.165	1.44	0.15	Not significant
		10^{th}	399	18.54	3.992			
	4.Board of school	CBSE	309	18.76	3.869	0.05	0.96	Not significant
		NBSE	541	18.74	4.211			

Note: t critical for 398 df at 0.05 level of significance=1.96

1. Mean score of girl secondary students is 18.84 and the mean score of boy secondary students is 18.65. The standard deviation (SD) of girl secondary students is 4.107 and that of boy secondary students is 4.069 [**table no. 4.11(1**)].

Table no. 4.11(1) it can be seen that the p-value is 0.51 (P>0.05) which is more than 0.05 and the t-value is 0.66 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in awareness (health problem) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender,"** is accepted.

2.Mean score of government secondary students is 18.59 and the mean score of private secondary students is 18.84. The standard deviation (SD) of government secondary students is 4.408 and that of private secondary students is 3.896 [**table no. 4.11(2**)].

Table no. 4.11(2) it can be seen that the p-value is 0.40 (P>0.05) which is more than 0.05 and the t-value is -0.83 which is less than the t critical value (1.96). Thus, the null

hypothesis, "**There is a no significant difference in awareness (health problem) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to type of management,"** is accepted.

3.Mean score of class 9^{th} secondary students is 18.94 and the mean score of class 10^{th} secondary students is 18.54. The standard deviation (SD) of 9^{th} secondary students is 4.165 and that of 10^{th} secondary students is 3.992 (**table no. 4.11(3**).
T**able no. 4.11(3)** it can be seen that the p-value is 0.15 (P>0.05) which is more than 0.05 and the t-value is 1.44 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in awareness (health problem) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to class,"** is accepted.

4.Mean score of CBSE secondary students is 18.76 and the mean score of NBSE secondary students is 18.74. The standard deviation (SD) of CBSE secondary students is 3.869 and that of NBSE secondary students is 4.211 [**table no. 4.11(4**)].
Table no. 4.11(4) it can be seen that the p-value is 0.96 (P>0.05) which is more than 0.05 and the t-value is 0.05 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in awareness (health problem) about usage of mobile phone** o**f secondary school students in Dimapur district of Nagaland with respect to board"** is accepted.

Research question 3.3: What is the level of awareness about age restrictions to use social media of secondary school students in Dimapur district of Nagaland?

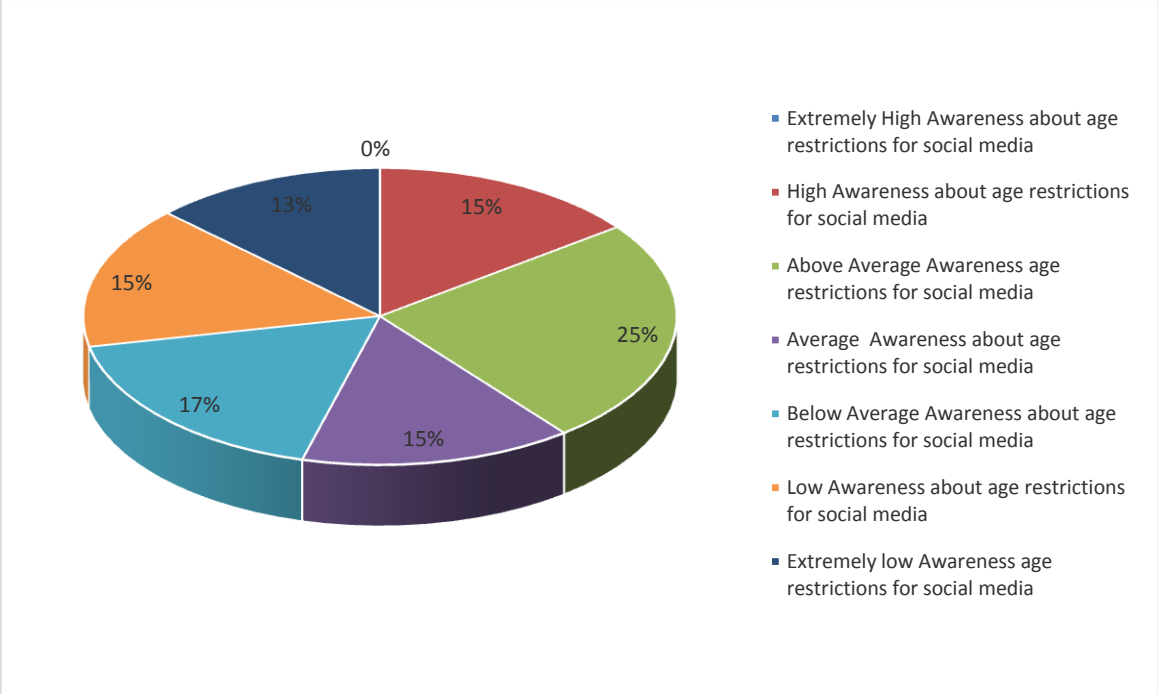


Fig 4.24: Graphical representation showing Level of awareness about age restrictions to use social media of secondary school students in Dimapur district of Nagaland.

From **fig 4.24** clearly indicates that only 0% of students having extremely high awareness about age restrictions to use social media, 15% students having high, 25% students having above average, 15% students having average, 17% students having below average, 15% students having low, and 13% students having extremely low awareness about age restrictions to use social media. The percentage has been taken out on the basis of **z-score** which has been calculated by the researcher for each individual in the sample.

Hypothesis 3.3: There is no significant difference in the awareness (age restriction) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

Table no. 4.12: Awareness (age restriction) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

Major Dimension and its Variables			N	Mean	SD	t Stat	P(T<=t) two-tail	Significant/ not Significant at 0.05/0.01
Awareness (age restriction)	1.Gender	Girl	451	2.92	1.415	-1.45	0.15	Not significant
		Boy	399	3.06	1.449			
	2.Type of Management	Government	307	2.72	1.540	-3.93	0.00	Significant
		Private	543	3.14	1.346			
	3.Class	9^{th}	451	2.94	1.465	-1.02	0.31	Not significant
		10^{th}	399	3.04	1.394			
	4.Board of school	CBSE	309	3.24	1.323	4.09	0.00	Significant
		NBSE	541	2.84	1.472			

Note: t critical for 398 df at 0.05 level of significance=1.96

1. Mean score of girl secondary students is 2.92 and the mean score of boy secondary students is 3.06. The standard deviation (SD) of girl secondary students is 1.415 and that of boy secondary students is 1.449 [**table no. 4.12(1**)].

T**able no. 4.12(1)** it can be seen that the p-value is 0.15 (P>0.05) which is more than 0.05 and the t-value is -1.45 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in awareness (age restriction) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender,"** is accepted.

2. Mean score of government secondary students is 2.72 and the mean score of private secondary students is 3.14. The standard deviation (SD) of government secondary students is 1.540 and that of private secondary students is 1.346 [**table no. 4.12(2**)].

Table no. 4.12(2) it can be seen that the p-value is 0.00 (P<0.05) which is less than 0.05 and the t-value is -3.93 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in Awareness (age restriction) about**

usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to type of management," is rejected.

3. Mean score of class 9th secondary students is 2.94 and the mean score of class 10th secondary students is 3.04. The standard deviation (SD) of 9th secondary students is 1.465 and that of 10th secondary students is 1.394 [**table no. 4.12(3**)].

Table no. 4.12(3) it can be seen that the p-value is 0.31 (P>0.05) which is more than 0.05 and the t-value is -1.02 which is less than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in awareness (age restriction) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to class,"** is accepted.

4. Mean score of CBSE secondary students is 3.24 and the mean score of NBSE secondary students is 2.84. The standard deviation (SD) of CBSE secondary students is 1.323 and that of NBSE secondary students is 1.472 [**table no. 4.12(4**)].

Table no. 4.12(4) it can be seen that the p-value is 0.00 (P<0.05) which is less than 0.05 and the t-value is 4.09 which is greater than the t critical value (1.96). Thus, the null hypothesis, **"There is no significant difference in awareness (age restriction) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to board"** is rejected.

Analysis based on simple percentage:

Research question 3.4: What are the health problems due to excessive usage of mobile phone faced by the secondary school students in Dimapur district of Nagaland?

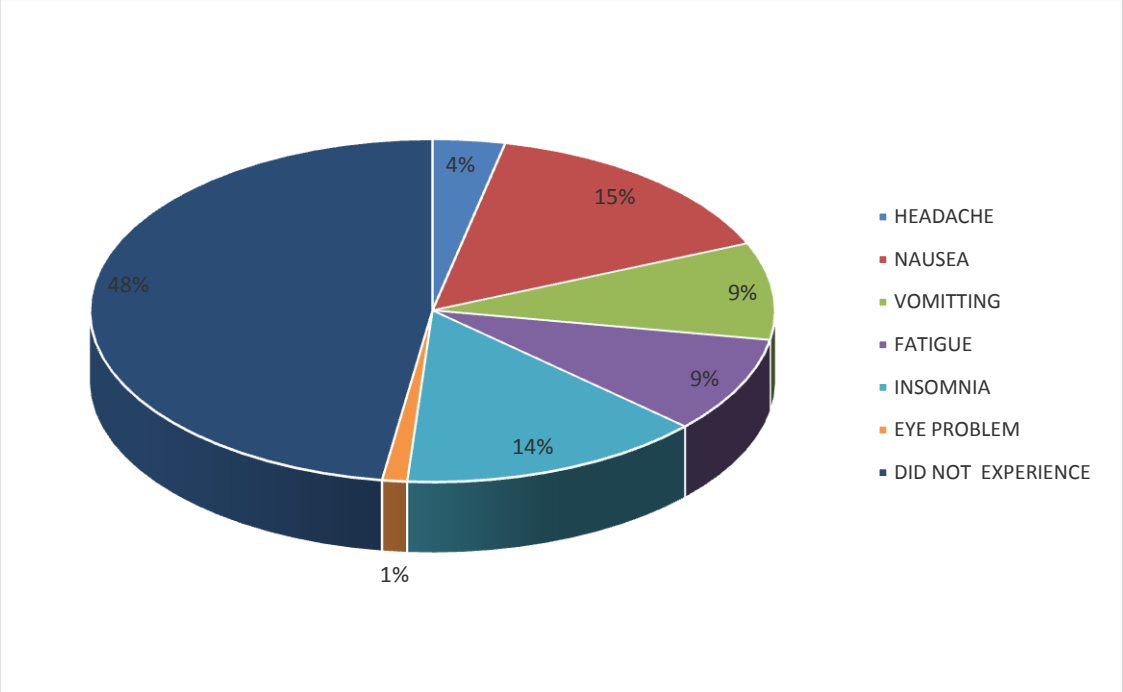


Fig 4.25: Graphical representation showing Health problems due to excessive usage of mobile phone faced by the secondary school students in Dimapur district of Nagaland

Fig 4.25 clearly indicates that only 4% of students have experience headache due to use of mobile phone, 15% students have experience Nausea, 9% students have experience vomiting, 9% students have experience fatigue, 14% students have experience insomnia, 1% students have experience eye problem and 47% students did not experience. Similar study by Anjali and Askokan (2020) revealed that the increased use of mobile phones by the male undergraduates with an age of more than 20 years report health hazards.

4.5 OBJECTIVE 4: TO STUDY THE SIGNIFICANT INFLUENCE OF USAGE OF MOBILE PHONE, AWARENESS OF USAGE OF MOBILE PHONE ON METACOGNITIVE ABILITY FOR SECONDARY SCHOOL STUDENTS IN DIMAPUR DISTRICT OF NAGALAND

Hypothesis-4: There is no significant influence of usage of mobile phone and awareness of usage of mobile phone on metacognitive ability

The analysis was carried out using linear multiple regression to investigate the association between usage of mobile phone and awareness of usages of mobile phone, and metacognitive ability.

Table no. 4.13: Regression statistics for metacognitive ability, usage of mobile phone, and awareness of mobile phone.

Regression Statistics	
Multiple R	0.291
R Square	0.085
Adjusted R Square	0.082
Standard Error	19.435
Observations	850.000

Table no.4.14: ANOVA

ANOVA					
	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	29583.18	14791.59	39.16080687	0
Residual	847	319923.82	377.71		
Total	849	349507.00			

Table no. 4.13 shows the multiple regression model for students' Metacognitive ability at secondary level. Where predictive variables are usage of mobile phone and awareness of mobile phone and Dependent variable is metacognitive ability

The model summary shows that the predictor variable usage of mobile phone and awareness of mobile phone has R value of 0.291 and R^2 value of 0.085 on metacognitive ability. As R^2 indicates a goodness of fit measure for regression model. This statistic indicates the percentage of the variance in the dependent variable that the independent variable explains collectively. Here, the calculated percentage is only 8% but after looking at F value (39.160) from **table no. 4.14**. It can be seen that it is significant at not only 0.05 but at 0.01 level of significance.

There is a limited contribution of usage of mobile phone and awareness of mobile phone on the metacognitive ability of an individual because there are many other factors like intelligence, study habits and personality, parental and teacher guidance may affect their metacognitive ability as whole.

This value indicates that regression model as whole is statistically significant.

Table No. 4.15: Co-efficient value, t value and p value of usage of mobile phone and awareness of mobile phone for metacognitive ability.

	Coefficients	***Standard Error***	***t Stat***	***P-value***	***Lower 95%***	***Upper 95%***	***Lower 95.0%***	***Upper 95.0%***
Intercept	147.00	4.53	32.44	0.00	138.108	155.898	138.108	155.898
USAGE OF MOBILE PHONE	0.53	0.09	5.92	0.00	0.354	0.705	0.354	0.705
AWARENESS ABOUT MOBILE PHONE USAGE	0.49	0.11	4.60	0.00	0.283	0.705	0.283	0.705

Based on the **table no. 4.15** it can see that all the p value is 0.00 (for each variable) which is obviously not only less than 0.05 level of significance but significant at 0.01 level also. It can be also seen that all the t value for usage of mobile phone and awareness of usage of mobile phone (5.92 and 4.60 respectively) are higher than the t critical value (1.96). It shows the significance of data. But again, looking at co-efficient value it can said that there is not much change visible on metacognitive ability by the usage of mobile phone and awareness of mobile phone. As the co- efficient for each explanatory variable talks about the average expected change in the response variable assuming the other explanatory variables remains constant (**table no. 4.15**).

Based on the above tables that the usage of mobile phone and awareness of mobile phone is significantly associated but it has not found a recognizable impact on metacognitive ability of the secondary students of Dimapur district.

Estimated Regression Equation-

$Y=147+0.53(X_1)+ 0.49 (X_2) +E$

Where,

y is Dependent variable

a is Intercept from the regression statistics

b and c are Co-efficient for each variable

X_1& X_2 are Independent variables

E is Error or residual

Overall, the results showed the utility of the predictive model was significant, (F=R square =0.085, $p < 0.01$).

Both the predictor explains 8% of the variance between the variables. The result showed that usage of mobile and awareness of mobile phone are significantly impacting the metacognitive level (t stat=5.92, $p<0.01$ and t stat=4.60, $p<0.01$ respectively) but not in a very recognizable manner.

CHAPTER -V

SUMMARY, MAJOR FINDINGS AND DISCUSSION, EDUCATIONAL IMPLICATIONS, SUGGESTIONS FOR FURTHER RESEARCH AND CONCLUSION

CHAPTER -V

SUMMARY, MAJOR FINDINGS AND DISCUSSION, EDUCATIONAL IMPLICATIONS, SUGGESTIONS FOR FURTHER RESEARCH AND CONCLUSION

CHAPTER –V

SUMMARY, MAJOR FINDINGS AND DISCUSSION, EDUCATIONAL IMPLICATIONS, SUGGESTIONS FOR FURTHER RESEARCH AND CONCLUSION

5.1 SUMMARY

5.1.1 INTRODUCTION

Metacognition has been widely accepted in psychology and is essential in learning. According to Flavell, 'Metacognition is an individual's knowledge of their cognitive processes and ability to control them by organizing, monitoring and modifying them as a function of learning.' "Metacognition refers to knowledge concerning one's cognitive processes or anything related." It will enable an individual to understand themselves and develop new skills. Individuals can revise their learning experience daily to evaluate the outcome. Metacognitive activities include planning, approaching a given learning task, monitoring comprehension, and assessing progress toward completing a task. Cognitive strategies promote learning and task completion, whereas Metacognitive strategies monitor the process.

Now, owning and using mobile phones has become integral to our lives. We use a mobile or smart phone for sending text messages, communicating with others, sharing various information, using social media, and for educational purposes. On the contrary to its utility, Davey and Davey (2014) stated that mobile phone addiction is considered one of the forms of compulsive use of "a mobile phone" by adolescents worldwide. A new kind of health disorder in this category among adolescents, smartphone addiction/misuse, is now considered challenging health policymakers globally to think about this rapidly emerging issue. It has become a global issue, especially amongst the youngsters. Many people connect to the internet and social media from their mobile phones. Students are also connected to the internet via mobile phones in their extracurricular time and courses. While using mobile phones for educational purposes is encouraged by a lot of research, most students use them for leisure as entertainment. This phenomenon, which turns to addiction after a specific period, adversely affects the students' academic performance. An alternate way of solving this can be to divert the

usage of mobile phones in learning activities and raise awareness of the defects of overusing mobile phones.

5.1.2 SIGNIFICANCE OF THE STUDY

To the investigator's knowledge, some researches or empirical evidence could be found in the existing literature in India and abroad to understand the relationship between Metacognitive awareness, social competence, study habits, academic achievement, mobile learning and usage of mobile phone. But no studies have examined the Metacognitive ability of secondary school students in relation to usage of mobile phone. Therefore, it becomes an imperative to study Metacognitive ability related to these relevant variables. That is why the present study is designed. With the criteria in mind, the present study was felt to be the need of the hour and was chosen by the researcher to find out Metacognitive ability of secondary school students in relation to the usage of mobile phone in Dimapur district.

5.1.3 STATEMENT OF THE PROBLEM

Many studies revealed the connection between mobile phone usage and the academic success. Research also mentioned that academic success depends upon the metacognitive ability. So, it is become imperative to investigate the relationship between usage of mobile phone and metacognitive ability. The present study is designed to study Metacognitive ability in relation to the usage of mobile phone. The present study is entitled as: ***"Metacognitive Ability of Secondary School Students in Relation to Usage of Mobile Phone in Dimapur district".***

5.1.4 OPERATIONAL DEFINITIONS

1. Metacognitive ability- Metacognitive ability refers to those abilities such as thinking, reasoning, comprehension, processing speed, attention, memory, visual discrimination which plan, aware, monitor, and evaluate their own cognitive activities independently.

2. Usage of Mobile phone- It refers to the extent to which a person uses a mobile phone.

3. Awareness of Mobile phone-It refers to an individual's consciousness or knowledge about their mobile phone use.

4. Secondary School students- It refers to the students of 9^{th} and 10^{th} standard in both government and private schools in Dimapur district, affiliated to Nagaland Board of School Education (NBSE) and Central Board of school Education (CBSE).

5.1.5 VARIABLES OF THE STUDY

Following are the dependent and dependent variables for the present study:

1. Dependent variable: Metacognitive ability

2. Independent variable: Usage of mobile phone and awareness of mobile phone.

3. Demographic variables: Gender (Boy and Girl), Type of School Management (Government and Private), Class (9^{th} and 10^{th}), and Board (NBSE and CBSE).

5.1.6 OBJECTIVES OF THE STUDY

The present study is designed to attain the following objectives:

1. To study the level of Metacognitive ability of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class and board.
2. To study the status of usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class and board.
3. To study the status of awareness about the usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class and board.
4. To study the significant influence of usage of mobile phone and awareness of usage of mobile phone on Metacognitive ability for secondary school students in Dimapur district of Nagaland.

5.1.7 RESEARCH QUESTIONS

For Metacognitive ability

1. What is the level of metacognitive ability of secondary school students in Dimapur district of Nagaland?

Dimension wise Research questions:

1.1 What is the level of knowledge of cognition of secondary school students in Dimapur district of Nagaland?

1.2 What is the level of Regulation of cognition of secondary school students in Dimapur district of Nagaland?

1.3 What is the level of Metacognitive experiences of secondary school students in Dimapur district of Nagaland?

For Usage of Mobile phone

2. What is the status of usage of mobile phone of secondary school students in Dimapur district of Nagaland?

Dimension wise Research questions:

2.1 What is the level of interest in the usage of mobile phone of secondary school students in the Dimapur district of Nagaland?

2.2 What is the status of time spent on the mobile phone of secondary school students in the Dimapur district of Nagaland?

2.3 What is the status of the usage of mobile phone for entertainment purposes of secondary school students in Dimapur district of Nagaland?

2.4 How much time do the students spend on mobile phone daily?

2.5 For what purpose most of the students are using mobile phone?

2.6 At what age did the students open their social media account?

2.7 How much time daily do the students spend on social media?

2.8 What do the students prefer to do in their leisure time?

2.9 Does the students play games on their mobile phone?

2.10 How many mobile games App the students have on their mobile?

2.11 How much time do the students spend daily playing games on mobile phone?

2.12 With whom do the students usually play mobile game?

2.13 For what purpose the students are using YouTube?

2.14 How much time does the students spend daily watching videos/ movies on the mobile phone?

2.15 How often do the students check their mobile phone?

For Awareness of Mobile phone

3. What is the level of awareness about usage of mobile phone of secondary school students in Dimapur district of Nagaland?

Dimension wise Research questions:

3.1 What is the level of awareness of mobile phone usage for the educational purpose of secondary school students in the Dimapur district of Nagaland?

3.2 What is the level of awareness of mobile phone usage in relation to health problems of secondary school students in the Dimapur district of Nagaland?

3.3 What is the level of awareness about age restrictions to use social media of secondary school students in the Dimapur district of Nagaland?

3.4 What health problems do secondary school students face due to excessive mobile phone usage in the Dimapur district of Nagaland?

5.1.8 NULL HYPOTHESES OF THE STUDY

The hypotheses for the present study are stated as null hypothesis:

1. There is no significant difference in metacognitive ability of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

   1.1 There is no significant difference in knowledge of Cognition of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

   1.2. There is no significant difference in regulation of cognition of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

   1.3. There is no significant difference in metacognitive experience of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

2. There is no significant difference in the usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

   2.1. There is no significant difference in interest for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

   2.2. There is no significant difference in the time spent for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

   2.3. There is no significant difference in the usage of mobile phone for entertainment purpose of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

3. There is no significant difference in the awareness about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

3.1. There is no significant difference in the awareness (educational purpose) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

3.2. There is no significant difference in the awareness (health problem) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

3.3. There is no significant difference in the awareness (age restriction) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board of school.

4. There is no significant influence of usage of mobile phone, awareness of usage of mobile phone on metacognitive ability.

5.1.9 DELIMITATIONS

- The study will be delimited to the Secondary School Students of class IX and X in Dimapur district.
- The study will be delimited to those students which are affiliated to the Nagaland Board of School Education (NBSE) and Central Board of School Education (CBSE).

5.1.10 METHODOLOGY

The present study has been conducted using 'Descriptive survey method'.

5.1.11 POPULATION

The present study intended to study the metacognitive ability in relation to usage of mobile phone. Hence, the population of this study comprised all the secondary school students of class 9 & 10, both private and government, affiliated with the Nagaland Board of School Education (NBSE) and Central Board of School Education (CBSE) in the Dimapur district.

5.1.12 SAMPLE

For the present research, a multi-stage random sampling technique was employed. At first-stage, 12 schools were selected based on a stratified simple random sampling technique. Total 850 secondary school students from class 9^{th} and 10^{th} were selected through stratified simple random sampling techniques for the study.

5.1.13 DESCRIPTION OF THE TOOLS

The tool used for the study:

Tool 1: Standardized Metacognition Scale (MCS-SMBA).

Tool 2: Self developed questionnaire for Usage of mobile phone.

Tool 3: Self developed questionnaire for Awareness of the mobile phone.

5.1.14 STATISTICAL TECHNIQUES USED

On the basis of the nature and distribution of the data appropriate statistical and non statistical techniques were applied for the analysis of data. The analysis of the data has been done with the help of Microsoft excel. The following are the techniques used in the present study for analysis and interpretation of data:

1. The items mentioned in both **table no. 3.6 & 3.8** with (*****) marks were analyzed only by simple percentage.
2. The simple descriptive statistical techniques like computation of mean, standard deviation, and z score were used to ascertain the level and status of various concerned variables and results were presented graphically in form of pie-chart.
3. T-test were applied to test the significance of difference in the mean score of different variables based on gender, type of management, class and board.
4. Linear multiple regression was applied to test significant influence of usage of mobile phone and awareness of usage of mobile phone on metacognitive ability.

5.2 MAJOR FINDINGS

The findings and discussion are drawn as per the objectives of the study using the data collected from secondary school students in Dimapur district of Nagaland and placed into dimensions and variables.

5.2.1 OBJECTIVE 1: TO STUDY THE LEVEL OF METACOGNITIVE ABILITY OF SECONDARY SCHOOL STUDENTS IN DIMAPUR DISTRICT OF NAGALAND WITH RESPECT TO GENDER, TYPE OF MANAGEMENT, CLASS AND BOARD

I.Research question 1: What is the level of metacognitive ability of secondary school students in Dimapur district of Nagaland?

- It was found that 2% of students having extremely high level of metacognitive ability, 9% students having high, 20% students having above average, 32% students having average, 22% students having below average, 10% students having low, and 5% students having extremely low level of metacognitive ability.32% i.e., majority of the students have average level of metacognitive ability,
  - ❖ The probable justification may be in a location like Dimapur, secondary school students might have better access to resources, including well-qualified teachers, libraries, and educational technology which will contribute to a moderate level of metacognitive ability due to better exposure to educational opportunities and support.

II.Hypothesis 1: There is no significant difference in metacognitive ability of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

1. It was found that there is no significant difference in Metacognitive ability of secondary school students in Dimapur district of Nagaland with respect to gender.

❖ The probable reason of no significance difference between girl and boy secondary students is that, equal educational opportunities and experiences may be provided to both girl and boy at home and school which can all impact the students in developing and expressing their metacognitive ability regardless of gender.

2. It was found that there is significant difference in Metacognitive ability of secondary school students in Dimapur district of Nagaland with respect to type of management. The private secondary school students have higher metacognitive ability than the government secondary school students.

❖ The probable reason may be students from private schools tend to have better economic background and may be receiving strong educational support at school and home, which may develop better metacognitive abilities in comparison to government secondary schools.

3. It was found that there is no significant difference in the level of metacognitive ability of secondary school students in Dimapur district of Nagaland with respect to class.

❖ The potential reason for no significant difference in level of metacognitive ability with respect to class 9^{th} and 10^{th}maybe they receive similar levels of educational support, which may contribute to the similarity in metacognitive abilities.

4. It was found that there is no significant difference in the level of metacognitive ability of secondary school students in Dimapur district of Nagaland with respect to board.

❖ The probable reason of no significant difference in the level of metacognitive ability is that secondary school students of both CBSE and NBSE board of school may have similar socio-economic backgrounds which have access to educational resources, including private tutoring, enrichment programs, and a supportive home environment and support can also include guidance from teachers and access to educational resources in school.

DIMENSION WISE FINDINGS

III. Research question 1.1: What is the level of knowledge of cognition of secondary school students in Dimapur district of Nagaland?

- It was found that 1% of students having extremely high level of knowledge of cognition, 6% students having high, 25% students having above average, 39% students having average, 21% students having below average, 5% students having low, and 3% students having extremely low level of knowledge of cognition.

❖ The potential reason may be that secondary school students in Dimapur may get better educational support like better teachers and resources, and teachers who use effective teaching methods, such as active learning and problem-based learning, may develop critical thinking skills, which may incline toward a better level of cognition of knowledge among the secondary school students.

IV. Hypothesis 1.1: There is no significant difference in knowledge of cognition of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

1. It was found that there is no significant difference in knowledge of cognition of secondary school students in Dimapur district of Nagaland with respect to gender.

❖ The probable reason may be that societal attitudes and gender roles have evolved, and equal opportunities may be given regardless of gender, narrowing the gap in knowledge levels between boys and girls secondary school students and in line with one another.

2. It was found that there is significant difference in knowledge of cognition of secondary school students in Dimapur district of Nagaland with respect to management. The private secondary school students have higher knowledge of cognition in comparison to government secondary school students.

❖ The probable reason may be may be because of their educational support, better infrastructure, and improvised teaching strategies, which may give a better educational experience, which can enhance their cognitive development of the private secondary students than government secondary students.

3. It was found that there is no significant difference in knowledge of cognition of secondary school students in Dimapur district of Nagaland with respect to class.

❖ The probable reason may be that the teaching methods and approaches that the 9^{th} and 10^{th} secondary school students tend to experience are similar which may lead to same level of knowledge of cognition.

4. It was found that there is no significant difference in knowledge of cognition of secondary school students in Dimapur district of Nagaland with respect to board.

❖ The probable reason may be secondary students from different board may be receiving similar educational support and quality of teaching which indicated no significant differences in knowledge of cognition of secondary school students even though CBSE and NBSE may have differences in their curriculum and syllabus.

V. Research question 1.2: What is the level of regulation of cognition of secondary school students in Dimapur district of Nagaland?

- It was found that 1% of students having extremely high level of regulation of cognition, 8% students having high, 23% students having above average, 39% students having average, 19% students having below average, 6% students having low, and 4% students having extremely low level of regulation of cognition.

❖ The probable reason for having varied levels of regulation of cognition of secondary school students in Dimapur district may be that the students come from a diverse population with varying educational, parental, and socioeconomic support levels. This diversity might lead to an average level of regulation of cognition, as most respondents have resulted in this category. The reason may be that students may have different cognitive abilities in planning, monitoring, and

evaluating their learning process and are inclined towards moderate awareness of learning strategies according to their knowledge of the cognitive function.

VI. Hypothesis 1.2: There is no significant difference in regulation of cognition of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

1. It was found that there is no significant difference in regulation of cognition of secondary school students in Dimapur district of Nagaland with respect to gender.

❖ The probable reason may be that societal attitudes and gender roles have evolved, and equal opportunities may be given regardless of gender, narrowing the gap in knowledge levels between boys and girls secondary school students. Another reason is that there might be no bias in guiding at home and school setup, which might incline towards no difference in the regulation of cognition with regard to gender among the secondary school students in the Dimapur district.

2. It was found that there is no significant difference in regulation of cognition of secondary school students in Dimapur district of Nagaland with respect to management.

❖ The probable reason of no significant difference between private and government secondary school students may be because of similar educational support, better infrastructure, and improvised teaching strategies, which can enhance their regulation of cognition among the secondary school students.

3. It was found that there is no significant difference in regulation of cognition of secondary school students in Dimapur district of Nagaland with respect to class.

❖ The probable reason for no significant difference between class 9 and 10 secondary school students in the regulation of cognition maybe they are in a similar stage of cognitive development, where they are developing critical thinking skills, problem-solving abilities, and metacognitive awareness, which can lead to similar regulation of cognition among the secondary school students.

4. It was found that there is significant difference in regulation of cognition of secondary school students in Dimapur district of Nagaland with respect to board. The NBSE secondary school students have higher regulation of cognition than CBSE secondary school students.

❖ The probable reasons may be that NBSE secondary students have better access to educational resources, such as textbooks, technology, and extracurricular activities, which can regulate their awareness better than CBSE secondary students. Another reason is that NBSE secondary school students may have a better approach to learning, which is inclined to a higher level of regulation of cognition than CBSE secondary school students.

VII. Research question 1.3: What is the level of metacognitive experiences of secondary school students in Dimapur district of Nagaland?

- It was found that 0% of students having extremely high level of metacognitive experiences, 8% students having high, 27% students having above average, 41% students having average, 14% students having below average, 5% students having low, and 5% students having extremely low level of metacognitive experiences.

❖ The probable reason may be that secondary school students in Dimapur may have different individual strengths, weaknesses, and past experiences. Some students may have a stronger natural inclination for metacognition, while others struggle more. Another reason is that external factors, such as the quality of teaching, classroom environment, and available resources, influence metacognitive experiences of the secondary school student naturally in employing more metacognitive strategies.

VIII. Hypothesis 1.3: There is no significant difference in metacognitive experience of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

1. It was found that there is significant difference in Metacognitive experience of secondary school students in Dimapur district of Nagaland with respect to gender. The girl secondary school students have higher metacognitive experience than boy secondary school students.

❖ The probable reason of girl having more metacognitive experiences than boy secondary school student is that girl might have stronger natural inclination for metacognition which might help them better in employing more metacognitive strategies to enhance their learning and more exposed to experiences comparing to boy secondary school students.

2. It was found that there is significant difference in metacognitive experience of secondary school students in Dimapur district of Nagaland with respect to

management. The private secondary school students having more metacognitive experience than government secondary school students.

- ❖ The probable reason may be that government schools often face resource constraints, including outdated teaching materials and inadequate facilities. Another reason is that socio-economic backgrounds may have differences in family support, access to educational resources at home, and exposure to enrichment activities, which influence better metacognitive experiences of private secondary school students than government secondary school students.

3. It was found that there is no significant difference in metacognitive experience of secondary school students in Dimapur district of Nagaland with respect to class.

- ❖ The probable reason for no significant difference in metacognitive experiences with respect to class is that school environment and support systems can also impact metacognitive development, which might result in no relative differences between class 9 and 10 secondary school students in the metacognitive experience.

4. It was found that there is no significant difference in metacognitive experience of secondary school students in Dimapur district of Nagaland with respect to board.

- ❖ The probable reason may be secondary students from different board may be receiving similar educational support and quality of teaching even though CBSE and NBSE may have differences in their curriculum and syllabus which resulted no significant difference in metacognitive experiences between CBSE and NBSE secondary school students.

5.2.2 OBJECTIVE 2: TO STUDY THE USAGE OF MOBILE PHONE OF SECONDARY SCHOOL STUDENTS IN DIMAPUR DISTRICT OF NAGALAND WITH RESPECT TO GENDER, TYPE OF MANAGEMENT, CLASS AND BOARD

I. Research question 2: What is the status of usage of mobile phone of secondary school students in Dimapur district of Nagaland?

- It was found that that 2% students having extremely high usage of mobile phone, 9% students having high, 22% students having above average, 32%

students having average, 22% students having below average, 12% students having low and 1% of students having extremely low usage of mobile phone.

- ❖ The probable reason is that students in this district may have better network coverage and more access to mobile phones because of their socioeconomic status and geographical factors, and other reason may be after the pandemic like Covid 19 most of students own mobile phone to access for online classes which may lead to more mobile phone usage among secondary students in the Dimapur district.

II. Hypothesis 2: There is no significant difference in the usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

1. It was found that there is no significant difference in the usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender.

- ❖ The probable reasons may be that access to mobile phone usage has become universal and less likely gender-based among secondary school students because both boys and girls may have equal access to mobile technology, reducing any potential gender-based differences in usage of mobile phone.

2. It was found that there is no significant difference in the usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to type of management.

- ❖ The probable reasons may be that mobile phone are often more accessible and affordable than other forms of technology, irrespective of the type of management. Mobile phone is integrated into education as tools for learning and communication. Both private and government secondary school students may use mobile phone for educational or other purposes.

3. It was found that there is significant difference in the usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to class. The Class 10^{th} students having higher usage of mobile phone than class 9^{th} students.

- ❖ The probable reason may be class 10^{th} students are older in age and may have more freedom than class 9^{th} students. For academic demands, one might use

mobile phones to access educational apps or communicate with classmates for study purposes.

4. It was found that there is significant difference in the usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to board. The CBSE school students having higher usage of mobile phone in comparison to NBSE secondary school students.

❖ The probable reason may be that CBSE students are from more affluent families which may have greater access to smartphones and mobile data plans. Other potential reason maybe they have a curriculum or teaching methods that encourage the use of technology and mobile devices for educational or other purposes more extensively than NBSE secondary school students.

DIMENSION WISE FINDINGS

III. Research question 2.1: What is the level of interest in the usage of mobile phone of secondary school students in Dimapur district of Nagaland?

- It was found that that 3% of students have extremely high interest in the usage of mobile phone, 7% of students have high, 22% of students have above average, 35% of students have average, 20% of students have below average, 12% of students have low, and 1% of students having extremely low interest in the usage of mobile phone.

❖ The probable reason may be that secondary school students are typically adolescents, and their level of interest in mobile phone usage can vary based on various purposes. Secondary students may use mobile phones for educational purposes, such as accessing online resources and participating in virtual classes, while others use them for communication, social media and gaming which have become part of their life.

IV. Hypothesis 2.1: There is no significant difference in interest for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

1. It was found that there is no significant difference in interest for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender.

- ❖ The probable reason is that both boy and girl of secondary students may have equal interest for usage of mobile phone of secondary school students on varying purposes which are less likely gender-based among secondary students.

2. It was found that there is significant difference in interest for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to management. The private secondary school students having higher interest for usage of mobile than government secondary school students.

- ❖ The probable reason may be private students own more mobile phone than government school students which may have significant digital divide, with limited access to smartphones and the internet that may restrict interest for mobile phone usage among the government school students than private school students.

3. It was found that there is significant difference in interest for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to class. The class 10^{th} secondary school students having higher interest for usage of mobile than class 9^{th} secondary school students

- ❖ The probable reason may be class 10^{th} students might use mobile phones more frequently to access educational resources, or exam preparation materials, which could increase interest in mobile phone usage than class 9^{th} secondary school students.

4. It was found that there is significant difference in interest for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to board. The CBSE secondary school students having higher interest for usage of mobile phone than NBSE secondary school students.

- ❖ The probable reason is that CBSE schools may be more inclined in interest for usage of mobile phone than NBSE school students because of varying approaches to curriculum and teaching methods that emphasize digital learning and the use of technology in education, other reasons may be parents' attitudes towards mobile phone usage, which may encourage the use of mobile phones for educational purposes of secondary school students. In contrast, others may restrict their children's access to mobile phone. Hence, this resulted in significant difference in interest for usage of mobile phone of secondary school students in Dimapur district.

V. Research question 2.2: What is the status of time spent on the mobile phone of secondary school students in Dimapur district of Nagaland?

- It was found that only 9% students having extremely high status of time spent on the mobile phone, 8% students having high status of time spent on the mobile phone, 10% students having above average status of time spent on the mobile phone, 48% students having average status of time spent on the mobile phone, 25% students having below average status of time spent on the mobile phone, 0% students having low status of time spent on the mobile phone and 0% of students having extremely low interest in the usage of mobile phone.

❖ The probable reason is that most secondary students may own mobile phones as it has become necessary despite their socio-economic status. They may spend time online and on social media to stay updated and engaged with the latest trends and events and use it for educational purposes instead of other recreational activities.

VI. Hypothesis 2.2: There is no significant difference in the time spent for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

1. It was found that there is no significant difference in time spent for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender.

❖ The probable reason is that both boys and girls of secondary school students may be spending time on mobile phones because urban areas like Dimapur, where students are likely to access mobile phones and the internet, are generally more widespread than rural areas without gender differences. Another reason may be both are techno friendly and are aware and interested about new technologies.

2. It was found that there is no significant difference in time spent for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to type management.

❖ The probable reason of no difference in time spent for usage of mobile phone between secondary students may be mobile phone are easily accessible and use by the students in daily activities despite economic disparities.

3. It was found that there is no significant difference in time spent for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to class.

❖ The probable reason of no difference in time spent for usage of mobile phone between secondary school students with respect to class may be mobile phone are easily accessible and use by the students in daily activities despite age differences.

4. It was found that there is no significant difference in time spent for usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to board.

❖ The probable reason may be of parental attitudes of NBSE and CBSE secondary school students toward mobile phone usage may be similar as parents may encourage or discourage mobile phone use for their children based on safety concerns which may not show no differences in time spent for usage of mobile phone.

VII. Research question 2.3: What is the status of the usage of mobile phone for entertainment purpose of secondary school students in Dimapur district of Nagaland?

- It was found that only 3% students having extremely high status of the usage of mobile phone for entertainment purposes, 8% students having high status of the usage of mobile phone for entertainment purposes, 19% students having above average status of the usage of mobile phone for entertainment purposes, 43% students having average status of the usage of mobile phone for entertainment purposes, 17% students having below average status of the usage of mobile phone for entertainment purposes, 10% students having low status of the usage of mobile phone for entertainment purposes, and 0% of students having extremely low status of the usage of mobile phone for entertainment purposes

❖ The probable reason is that secondary students may have increased ownership of mobile phone with internet connectivity in locations like Dimapur, which provides them with easy access to various forms of entertainment like watching videos or movies online.

VIII. Hypothesis 2.3: There is no significant difference in the usage of mobile phone for entertainment purpose of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

1. It was found that there is no significant difference in usage of mobile phone for entertainment purpose of secondary school students in Dimapur district of Nagaland with respect to gender.

- ❖ The probable reason may be mobile phone have become universal and have access to them, which indicates no significant difference in the usage of mobile phone for entertainment purposes with respect to gender. This widespread access can diminish differences based on gender, i.e., boy and girl, to some extent.

2. It was found that there is significant difference in usage of mobile phone for entertainment purpose of secondary school students in Dimapur district of Nagaland with respect to type of management. The Government secondary school students having higher usage of mobile for entertainment purpose than private secondary school students.

- ❖ The probable reason is that private secondary students may have greater resources and more structured routines, which could lead to less mobile phone use for entertainment among students than the government secondary students. The other reason may be that the teaching methods and curriculum in private and government schools may differ, affecting students' priorities and time management, which could reduce leisure, phone time among secondary students.

3. It was found that there is no significant difference in usage of mobile phone for entertainment purpose of secondary school students in Dimapur district of Nagaland with respect to class.

- ❖ The probable reason may be that secondary students of class 9^{th} and 10^{th}may have similar interests and engage in similar online entertainment activities due to peer pressure and social norms which resulted in no significant difference between class 9^{th} and 10^{th} in usage of mobile phone for entertainment purpose.

4. It was found that there is no significant difference in usage of mobile phone for entertainment purpose of secondary school students in Dimapur district of Nagaland with respect to Board of school.

❖ The possible reason for no significant difference in usage of mobile phone for entertainment purpose of secondary school students concerning the board of school may be mobile phone are easily accessible and are consistently inclined towards spending time in entertainment purposes, which are influenced by their peer groups and regional culture.

FINDINGS BASED ON SIMPLE PERCENTAGE

I. Research question 2.4: How much time do the students spend on mobile phone daily?

- It was found that 47% students spent 1-2 hours time on mobile phone, 34% students spent 3-4 hours time on mobile phone, 13% students spent 5-6 hours time on mobile phone, 1% students spent more than 6 hours time on mobile phone, and 5% students did not response.

❖ The probable reason may secondary school may be likely to have their own device after the Covid 19 and are using their mobile phone daily as a source of information and for learning purposes. The other reason may be some are addicted which they are over using it for longer period and peer pressure can influence to increased screen time.

II. Research question 2.5: For what purpose most of the students are using mobile phone?

- It was found that 13% students use mobile phone for educational purpose, 44% students use mobile phone for call and text message purpose, 24% students use mobile phone for social media and entertainment purpose, and 19% students did not response.

❖ The probable reason of 13% students use mobile phone for educational purpose may be educational apps and websites can enhance their learning experience. 44% students use mobile phone for call and text message purpose may be students use them to stay in touch with friends and family, and 24% students use mobile phone for social media and entertainment purpose as it attracts and offer a wide range of entertainment options and browsing social media which provide a

way for students to relax during their free time and stay update with the trends and connected with their peer group.

III. Research question 2.6: At what age did the students open their social media account?

- It was found that 2% of students have started using social media at the age of 5-10 years, 59% of students have started using social media at the age of 11-15 years, 19% of students have started using social media at the age of 16-20 years and 20% students did not response.

❖ The probable reasons may be parents prioritize education where digital literacy become important and students in this age group are more likely to have their own device and thus, engage with social media platforms easily since most of the age limit to open social media account is 13 years and above.

IV. Research question 2.7: How much time daily do the students spend on social media?

- It was found that 49% spent 1 hour on social media, 22% spent 2 hours on social media, 11% spent 3 hours on social media, 4% spent more than 3 hours on social media, and 14 % students did not response.

❖ The probable reasons may be the students are open towards social media and comfortable in communicating with friends and peers using social media platforms like Facebook, snapchat, or Instagram. The other reason maybe it can be a source of news and information to stay tune with latest trends instead of staying socially active in reality.

V.Research question 2.8: What do the students prefer to do in their leisure time?

- It was found 51% students spent time with family and friends during leisure time, 10% students wanted to be socially active during leisure time, 6% students spent time using mobile phone during leisure time, 24% spent on study during leisure time and 9 % students did not response.

❖ The probable of 51% of the students wanted to spend their leisure time with their family and friends maybe they have strong emotional bonds with their family and close friends which may provides a sense of comfort, support, and happiness, and

24% wanted to spend on study may be because of educational environments where there is intense competition and pressure to excel academically.

VI.Research question 2.9: Does the students play games on their mobile phone?

- It was found that 69% students play online game, 30% students do not play online game, and 1% students did not response

❖ The probable reason may be online games offer an enjoyable and entertaining way to spend free time among the students rather conventional/out door games.

VII. Research question 2.10: How many mobile games App the students have on their mobile?

- It was found that 37% students have no game app, 43% students have one (1) mobile game apps, 9% students have two (2) mobile game apps, 5% students have three (3) mobile game apps, 4% students have more than 3 mobile game apps and 2 % students did not response.

❖ The probable reasons may be mobile games may fill the gaps in a student's day when they have some idle time.

VIII. Research question 2.11: How much time do the students spend daily playing games on mobile phone?

- It was found that 41% students time spent (0-30 minutes) on playing mobile game, 29% students time spent (1-2 hours) on playing mobile game, 22% students time spent (3-4 hours) on playing mobile game, 3% students time spent (5-6 hours) on playing mobile game mobile phone, 0% students time spent (more than 6 hours) on playing mobile game mobile phone, and 5% students did not respond.

❖ The probable reason of spending time playing games on mobile games may be mobile games provide a convenient and easily accessible source of entertainment and relaxation for secondary students and offer a wide variety of mobile games, catering to different tastes and preferences for the students.

IX. Research question 2.12: With whom do the students usually play mobile game?

- It was found that 50% students play online mobile game with family and friends, 16% students play mobile online game with unknown person, and 34% students did not response.

❖ The potential reason for 50%, i.e., the majority of the students playing an online game with family and friends, maybe it allowed to bond over shared interests and hobbies**.** The other reason 16% of students playing on line games with the unknown person may be students feel more comfortable playing with strangers as it avoids judgments or stereotypes rather than with a known person.

X. Research question 2.13: For what purpose the students are using YouTube?

- It was found 53% students uses YouTube for watching videos for entertainment purpose, 30% students use YouTube for watching videos for educational purpose, and 17% students did not response.

❖ The probable reason of majority of students using Youtube for entertainment rather than for educational purpose may be students spend more time on academic in the school so they may prioritize relaxation and entertainment over educational content while using You tube.

XI. Research question 2.14: How much time does the students spend daily watching videos/ movies on the mobile phone?

- It was found that 23% spent (0-30 minutes) daily watching videos/ movies on the mobile phone, 52% spent (1-2 hours) daily watching videos/ movies on the mobile phone, and 16% spent (3-4 hours) daily watching videos/movies on the mobile phone, 5% spent (5-6 hours) daily watching videos/ movies on the mobile phone, 0% spent (more than 6 hours) daily watching videos/ movies on the mobile phone, and 4% students did not response.

❖ The probable reason may be secondary students are watching videos and movies can be a form of entertainment and relaxation for student.

XII. Research question 2.15: How often do the students check their mobile phone?

- It was found that 3% students check their mobile phone when they get a notification, 63% students check their mobile phone every 15 minutes, 12%

students check their mobile phone every 30 minutes, 15% students check their mobile phone, when necessary or get time, and 7% students did not response.

- ❖ The probable reason for frequently checking their mobile phone maybe it has become a habit for them and some students may experience anxiety about missing out on social events or trends and staying connected and informed with their peer groups.

5.2.3 OBJECTIVE 3: TO STUDY THE AWARENESS ABOUT THE USAGE OF MOBILE PHONE OF SECONDARY SCHOOL STUDENTS IN DIMAPUR DISTRICT OF NAGALAND WITH RESPECT TO GENDER, TYPE OF MANAGEMENT, CLASS AND BOARD

I. Research question 3: What is the level of awareness about usage of mobile phone of secondary school students in Dimapur district of Nagaland?

- It was found that 1% of students having extremely high awareness about usage of mobile phone, 7% students having high, 24% students having above average, 40% students having average, 15% students having below average, 9% students having low, and 4% students having extremely low awareness about usage of mobile phone.
- ❖ The probable reason may be students have easier access to mobile phones due to better network coverage and more affordable options in district like Dimapur. The other reason is that at this stage they are influenced by the peer group and they like it to connect it with their friends, and students are more tech savvy and aware of the various functions of mobile phone. As a result, they may have a higher awareness of mobile phone usage compared to another district in Nagaland.

II. Hypothesis 3: There is no significant difference in the awareness about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board.

1. It was found that there is no significant difference in awareness about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender.

- ❖ The reason may be there is equal access to mobile phones with respect to gender but it depends on different purpose while some students may be use for social communication and other may use for educational purposes.

2. It was found that there is significant difference in awareness about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to type of management. The private secondary school students having higher awareness about the usage of mobile phone than government secondary school students.

- ❖ The probable reasons may be that private secondary students may be from higher-income families based on socioeconomic factors than government secondary schools which are more likely to have access to mobile phones and other technology which can lead to greater awareness about usage of mobile phone

3. It was found that there is no significant difference in the level of awareness about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to class.

- ❖ The probable reason of no difference in awareness of usage of mobile phone may be because of close in age which can lead to consistent awareness levels among the 9^{th} and 10^{th} secondary students.

4. It was found that there is significant difference in the level of awareness about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to board. The CBSE secondary school students having higher level of awareness about the usage of mobile phone than NBSE secondary school students.

- ❖ The probable reason of difference between CBSE and NBSE board of school maybe they are coming from varying socioeconomic backgrounds. Students from more affluent backgrounds may have greater access to mobile phones, leading to a higher awareness of mobile phone usage among the secondary school students.

DIMENSION WISE FINDINGS

III. Research question 3.1: What is the level of awareness of usage of mobile phone for educational purpose of secondary school students in Dimapur district of Nagaland?

- It was found that only 0% of students having extremely high usage of mobile phone for educational purpose, 10% students having high, 17% students having above average, 49% students having average, 12% students having below average, 8% students having low, and 4% students having extremely low usage of mobile phone for educational purpose.

❖ The reason is that the students in a location like Dimapur have more access to mobile phone and access to technology, which can influence awareness and usage of mobile phone for educational purposes. Secondary students in Dimapur may have better digital literacy skills, which can affect their ability to raise the level of awareness of the usage of mobile phone for educational purposes.

IV. Hypothesis 3.1:There is no significant difference in the awareness (educational purpose) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

1. It was found that there is no significant difference in awareness (educational purpose) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender.

❖ The probable reason for no significant difference with respect to gender is that both girls and boys have equal access to mobile phones, ensuring that both boys and girls receive neutral guidance from their parents regardless of gender.

2. It was found that there is significant difference in awareness (educational purpose) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to type of management. The private secondary students having higher awareness (educational purpose) about usage of mobile phone than government secondary students.

❖ The reason is that private school students may be primarily from higher-income families who can afford smartphones and have access to the internet, which led to high awareness of mobile phone usage for educational purposes. In contrast, students in government schools may come from lower-income backgrounds and have limited access to smartphones and the internet. Thus, the socioeconomic status and the students' families' guidance can impact their exposure to technology and their ability to use mobile phones for educational purposes.

3. It was found that there is significant difference in awareness (educational purpose) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to class. The class 10^{th} secondary school students having higher awareness (educational purpose) about usage of mobile phone than class 9^{th} secondary school students.

❖ The probable reason is that class 10^{th} secondary students may be more mature than class 9^{th} secondary students and has a greater capacity for understanding and responsible use of technology, including mobile phones. Another reason is that class 10^{th} secondary students may be preparing for board exams, and they use more mobile phone for educational purposes than class 9^{th} secondary students.

4. It was found that there is significant difference in awareness (educational purpose) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to board. The CBSE secondary school students have higher awareness (educational purpose) about usage of mobile phone than NBSE secondary school students.

❖ The probable reason for differences with respect to the board of school is that CBSE school students have a better awareness of the potential benefits of using mobile phones for learning and the utilization of mobile phones for educational purposes. CBSE Schools may have varying approaches to integrating technology into the curriculum, which may be more inclined to incorporate technology into teaching methods than NBSE schools.

V. Research question 3.2: What is the level of awareness of usage of mobile phone in relation to health problem of secondary school students in Dimapur district of Nagaland?

- It was found that 1% of students having extremely high awareness about using mobile in relation to health problem, 10% students having high, 25% students having above average, 37% students having average, 16% students having below average, 8% students having low, and 3% students having extremely low awareness about using mobile in relation to health problem.

❖ The reason is that the secondary students in a location like Dimapur mostly own and have access to the mobile phone, which has become necessary. Students

might have awareness about using mobile phone relating to health problems which they are educated about and might have experienced a negative impact on their academic performance due to the excessive usage of the mobile phone as constant distractions, such as text messages and social media notifications which might have hinder concentration and learning among the secondary students.

VI. Hypothesis 3.2: There is no significant difference in the awareness (health problem) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

1. It was found that there is no significant difference in awareness (health problem) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender.

❖ The probable reason is that both girl and boy secondary students might have equal access to mobile phone and are aware of and have experiences with health issues relating to mobile phone usage since it will not differ as they use them consistently regardless of gender.

2. It was found that there is a no significant difference in awareness (health problem) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to type of management.

❖ The reason is that regardless of varied socio-economic backgrounds and types of management, secondary students might have access to or be exposed to mobile phone and have experience and knowledge about health problems due to the usage of the mobile phone.

3. It was found that there is no significant difference in awareness (health problem) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to class.

❖ The probable reason is that both class 9 and class 10 students are likely to have similar levels of exposure to mobile phones and digital devices regardless of their class difference. They may use their phones for communication, studying, social media, and entertainment to a similar extent, which leads to similar awareness of potential health problems in mobile phone usage.

4. It was found that there is no significant difference in awareness (health problem) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to board.

❖ The probable reason is that board of schools like CBSE and NBSE schools might have incorporate awareness programs about health-related issues, including mobile phone usage, into their curriculum which is concern in today present generation which indicates no significant difference in awareness (health problem) about usage of mobile phone of secondary school students.

VII. Research question3.3: What is the level of awareness about age restrictions to use social media of secondary school students in Dimapur district of Nagaland?

- It was found that 0% of students having extremely high awareness about age restrictions to use social media, 15% students having high, 25% students having above average, 15% students having average, 17% students having below average, 15% students having low, and 13% students having extremely low awareness about age restrictions to use social media.

❖ The probable reason for the level of awareness about age restrictions to use social media by secondary school students may be the influence of teachers on responsible internet use, including age restrictions in the schools. The other reason is that locations like Dimapur have more internet access and exposure to technology, and students with higher levels of media literacy are more likely to understand the implications of age restrictions and privacy concerns on social media.

VIII. Hypothesis 3.3: There is no significant difference in the awareness (age restriction) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender, type of management, class, and board

1. It was found that there is no significant difference in awareness (age restriction) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to gender.

❖ The probable reason for no significant difference with respect to gender is that mobile phones have become omnipresent, and it is common for students across gender, which leads to a relatively consistent level of awareness

regarding age restrictions. Schools may implement educational programs or guidelines emphasizing responsible mobile phone usage and age restrictions, which can target all students regardless of gender, ensuring a consistent level of awareness among secondary students.

2. It was found that there is significant difference in awareness (age restriction) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to type of management. The private secondary school students having higher awareness (age restriction) about usage of mobile phone of secondary school students than government secondary school students.
   - ❖ The probable reason may be is that private secondary students have more awareness as schools may have implemented educational programs and strict restrictions with more permissive policies emphasizing responsible mobile phone usage and age restrictions than the NBSE secondary students which may influence students' awareness and behavior.

3. It was found that there is no significant difference in awareness (age restriction) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to class.
   - ❖ The probable reason for no significant difference with respect to class 9^{th} and 10^{th} is schools may implement educational programs or guidelines emphasizing responsible mobile phone usage and age restrictions, which can target all students regardless of class differences, ensuring a consistent level of awareness among secondary students.

4. It was found that there is significant difference in awareness (age restriction) about usage of mobile phone of secondary school students in Dimapur district of Nagaland with respect to board of school. The CBSE secondary school students having higher awareness (age restriction) about usage of mobile phone than NBSE secondary school students.
   - ❖ The probable reason may be that CBSE Secondary school students have more awareness as schools may have implemented educational programs emphasizing responsible mobile phone usage and age restrictions than the NBSE secondary school students. The other reason may be information and

guidance provided by the parents to their children at home resulted in differences in awareness relating to age restriction about mobile phone usage of the secondary school students.

IX. Research question 3.4: What are the health problems due to excessive usage of mobile phone faced by the secondary school students in Dimapur district of Nagaland?

- It was found that only 4% of students have experience headache due to use of mobile phone, 15% students have experience Nausea, 9% students have experience vomiting, 9 % students have experience fatigue, 14% students have experience insomnia, 1% students have experience eye problem and 47% students did not experience.
  - ❖ The probable reason of facing health issues relating mobile phone usage is that secondary school students might have use of mobile phones for online gaming or watching videos for longer period which can strain the eyes, leading to discomfort and sometimes, digital eye pressure and staring at small screens for extended periods without breaks can cause eye fatigue and nausea whereas excessive phone use at night time which may cause insomnia, which can negatively impact overall health and academic performance of the students. Hence to reduce the health problems parents should establish healthy screen time habits, and maintain open contact with their children about the responsible use of mobile devices.

5.2.4 OBJECTIVE 4: TO STUDY THE SIGNIFICANT INFLUENCE OF USAGE OF MOBILE PHONE AND AWARENESS OF USAGE OF MOBILE PHONE ON METACOGNITIVE ABILITY FOR SECONDARY SCHOOL STUDENTS IN DIMAPUR DISTRICT OF NAGALAND

I. Hypothesis 4: There is no significant influence of usage of mobile phone and awareness of usage of mobile phone on metacognitive ability.

- It was found that there is significant but very less influence/contribution influence usage of mobile phone, awareness of usage of mobile phone on metacognitive ability.

- The probable reason is that students may use their metacognitive ability to seek information and resources to support their learning. As a result, it showed that usage of mobile and awareness of mobile phone are significantly impacting the metacognitive ability. Even now, especially after the Covid 19 the students are also learning "How to learn." It may be the reason that the usage of mobile phone is impacting metacognitive ability. Even though the use of mobile phone is impacting the metacognitive ability but it is very less. There are many other factors which may affect the metacognitive ability. For example, intelligence, study habits, personality, parental, and teacher's guidance and many more.

5.3 DISCUSSION

The present study indicated that that 32% i.e., majority of the secondary students fall under the category of average level of metacognitive ability. Hence, it indicates that there is moderate level of metacognitive ability among the secondary students in Dimapur district. It was simply stated that the secondary school students are identically distributed among each level of metacognitive ability. Study by Diaz (2015) mentioned that students can be more conscious about the deck of strategies they use in their vocabulary learning process when they employ different vocabulary strategies and identify the integration of metacognitive strategies. Another study by Abiodun et al. (2021) depicted that there is no significant relationship between students' metacognitive ability and academic performance in Mathematics among senior secondary school students, which stated that the learning approach that teachers adopt can encourage learners to monitor, evaluate and strategize their learning. It has been revealed by Zulkiply (2006) that Students' academic performance was also positively related to the metacognitive regulation. Similarly, a study by Montellado and Lovitas (2023) found that the level of metacognitive awareness as perceived by Junior High School students is high which stated that that students have used the highest level of wisdom in their studies.

Through this study, it has been found that there is no significant difference in the metacognitive ability of secondary school students in the Dimapur district of Nagaland with respect to gender. Still, contrary to this finding, it has been found in the major dimension that there is a significant difference in the metacognitive experience of

secondary school students in the Dimapur district of Nagaland with respect to gender. Previous study conducted by Abiodun et al. (2021) found no significant relationship between male and female students' metacognitive ability on their Mathematics performance among senior secondary school students in Ondo State. This may be due to equal educational opportunities and experiences are providing to both girl and boy at home and school which may impact the students in developing and expressing their metacognitive ability regardless of gender.

The study also revealed a significant difference in the metacognitive ability of secondary school students in the Dimapur district of Nagaland with respect to the type of management, i.e., Government and private secondary school students in Dimapur district. Contrary to these findings, results shown by Rajesh (2021) show no significant difference in the Meta-cognition ability of secondary school students educated in government and private aided schools. It may vary in context as private secondary school students in the Dimapur district may receive better educational support at school and home, which may develop better metacognitive abilities than the government secondary school students in the Dimapur district.

Another finding of the present study observed that there is no significant difference of usage of mobile phone among the secondary school student with regard to gender and type of management. This may be students in this district may have better network coverage and more access to mobile phones because of their socioeconomic status and geographical factors, and mobile phone are often more accessible and affordable than other forms of technology. Secondary students at this age may be wanted to be part of social group by the use of technology for their psychological needs. Rani and Deswal (2019) found that significant negative relationship was found between general well-being and mobile phone usage among senior secondary School Students. It revealed that usage of mobile phone increases social competence of students decreases and vice-versa.

Another findings of the present study observed that around 53 % of respondents of secondary school students have experience health problems due to excessive use of mobile phone like headache, nausea, insomnia and eye problem. The reason may be that secondary school students might have over use mobile phone for online gaming or

watching videos for longer period which has experience health related issues. In resonance with this finding, a study by Anjali & Askokan (2020) revealed that the increased use of mobile phones by the male undergraduates aged more than 20 years reported health hazards.

Through this study it was found that significant low influence of usage of mobile phone, awareness of usage of mobile phone on metacognitive ability. It may be students may incline to use mobile phones for gaming, social media, studying, and staying informed, and students with average metacognitive abilities may be more likely to identify and utilize these resources effectively, leading to increased mobile phone usage for educational purposes. In contrary, study by Rani & Deswal (2019) found that significant negative relationship was found between study habits and mobile phone usage among senior secondary school students. It indicates that more usage of Mobile Phone leads to worsen the study habits of students. This result is also in line with Marantika (2021), who found significant partial and multiple relationships between metacognitive abilities and autonomous learning with Indonesian language learning outcomes in the faculty of teacher training and education of Pattimura University, which indicated that metacognitive abilities and autonomous learning contribute positively to the learning outcomes of the Indonesian Language on students with majoring in Language and Arts.

5.4. EDUCATIONAL IMPLICATIONS

The researcher has laid down some positive educational implications for further actions to enhance the metacognitive ability concerning mobile phone usage among the secondary school students of the Dimapur district. The present study has the following practical implications and valuable inputs for the various stakeholders like teachers, administrators, parents, educators, and others-

- The teachers should know the importance of the metacognitive ability of individuality to boost the learning outcome by creating innovative teaching methods and learning activities.
- Metacognitive ability should be developed among school students. Then only they can reflect on their learning methods, their performance in the class room activities and improve their academic achievements accordingly.

- The study shows that gender, class and board of school do not influence the metacognitive ability of secondary students. So, what is needed are innovative teaching methods, learning activities and making an independent learner that arouse and develop the metacognitive ability of the students.
- Schools should create an environment where free thinking is appreciated. It should transcend from teacher-dominated classrooms to learner-directed and group activities classrooms and from rote memory to problem awareness and problem-solving to develop metacognitive ability.
- Metacognition has become imperative and beneficial in learning found in research. It is considered cost-effective as it doesn't demand specialist equipment, but it requires training in the method effectively.
- The training in metacognitive strategies benefits classroom practices by enriching the metacognition process. Metacognitive strategies provide learners with the knowledge and ability to accumulate learning tools to carry out learning goals and understand features from their learning methods to manage cognitive processes when developing their learning.
- The study's finding shows that average respondents of the Dimapur district secondary students spend time on mobile phones. So, teachers should consider how to integrate the mobile phone into the teaching and learning process. Teachers can use mobile phones to engage students fruitfully.
- Despite mobile phone utility in our day-to-day life, excessive use of mobile phones has become haphazard or uncontrollable. To minimize it, parents and educators play an equal role. Parents at home can teach by developing healthy phone habits and following some rules. Teachers can use mobile phones as a learning tool and encourage them to use them for educational purposes.
- This study will help psychologists and sociologists to understand the behavior pattern of the secondary school students in Dimapur district and various associated health problems with excessive mobile phone use.
- From the findings on the awareness about age restrictions to use social media of secondary school students in Dimapur. Primarily, students have social media accounts below the restricted age, which shows concern if they need to be aware of their safety and guidelines. It can be a threat to the protection of students. It will be crucial for the teachers and parents to talk to their wards and check that they are not getting trapped in some unlawful activity through mobile phones.

- This study prompts teachers and administrators to arrange for the proper guidance and counseling of mobile phone users among secondary school students. So that students use the mobile phone effectively and use it for their educational benefit instead of other uses, which may affect their concentration level in their studies.
- Mobile phones offer a wide range of educational apps and resources that can assist students in their learning process. Students with strong metacognitive abilities may be more likely to identify and utilize these resources effectively, leading to increased mobile phone usage for educational purposes. Parents at home and teachers at school can give guidance and awareness about its positive uses.

5.5. SUGGESTIONS FOR FURTHER RESEARCH

The present study was conducted on "Metacognitive ability of the secondary school students in relation to the usage of mobile in Dimapur district," the researcher felt the need for conducting further research in relating with Metacognitive ability and Usage of mobile phone. The investigator has listed possible suggestions for further research:

1. The present study was limited only to secondary school students in Dimapur district and state level.
2. It can be further extended to higher secondary level or at college level.
3. The present study was limited only to Dimapur district; it can be further extended to other district in Nagaland and at other state level.
4. Comparative studies can be undertaken between different district in Nagaland or other states in India.
5. Studies can be undertaken on other variables like locality and other board of school such as ICSE and other state board of school.
6. The present study was limited to three variables: Metacognitive ability, usage of mobile phone and awareness of mobile phone. The study can be done on the relationship of metacognitive ability on the other variables too.

5.6 CONCLUSION

The present study "Metacognitive ability of the secondary school students in relation to the usage of mobile in Dimapur district", with a sample drawn from 850 students, found there is a positive significant but low influence of usage of mobile phone and awareness of usage of mobile phone on metacognitive ability. Metacognitive ability involves self-awareness, self-regulation, and effective learning strategies, which can enhance a student's ability to use mobile phones as educational tools. Students who use metacognitive abilities effectively seek information and resources to support their learning. Mobile phones are powerful tools for accessing information, so students with strong metacognitive skills may be more inclined to use mobile phones for research, studying, and staying informed. Mobile phones offer a wide range of educational apps and resources that can assist students in their learning process. Students with strong metacognitive abilities may be more likely to identify and utilize these resources effectively, leading to increased mobile phone usage for educational purposes.

The present researcher also provides significant educational implications to the policy makers, administrators, parents, teachers, and others about metacognitive ability of the secondary students in relations to usage of mobile phone. It is considered that metacognitive awareness is essential for successful learning because it enables students to manage their cognitive skills better, perform better than unaware learners, and construct new cognitive skills more strategically. The problems with excessive mobile phone usage among learners can be alternated with forms of learning in schools as it does well in education when the teacher uses it as a tool. Therefore, the teacher has to act as the facilitator and educator to direct the learner at school and parent at home, taking the role of responsible parent in enhancing the metacognitive ability of the students and giving awareness on the impact of mobile phone usage among the secondary school students in Dimapur district.

REFERENCES

REFERENCES

Abiodun, P.A., Isreal, O.O., & Ezekiel, F.A. (2021). Metacognitive ability as determinant of senior secondary school student academic performance in mathematics in Ondo state Nigeria. *Quest Journals of Research in Humanities and Social sciences*, 9(12), 68-73.

Ana, B., & Singh, M. (2018). Study of effect of metacognition self system and home environment on the academic achievement of secondary school students of Jammu district.*University of Jammu.* http://hdl.handle.net/10603/237489

Andreassen, C. S., Billieux, J., Griffiths, M. D., Kuss., D. J., Demetrovics, Z., Mazzoni, E., & Pallesen, S. (2016). The relationship between addictive use of social media and video games and symptoms of psychiatric disorders: A large-scale cross-sectional study. *Psychology of Addictive Behaviors, 30*(2), 252.

Anjali, P.K., & Askokan, A. (2020). Deteminants of mobile phone usage among university students in Kerala an empirical study.*Kannur University.* http://hdl.handle.net/10603/353333

Ansari, M.S., Channar, Z.A., & Syed, A. (2012). Mobile phone adoption and appropriation among the young generation.*Procedia -Social and Behavioral Sciences, 41*, 265-272.

Aoki, K., & Downes, E.J. (2003). An analysis of young people's use ofand attitudes toward cell phones.*Telematics and Informatics, 20*, 349–364 https://www.angelfire.com/ego2/lostboyrahul/work/cellphoneuse.pdf

Asraf, R.M., & Supian, N.(2017). Metacognition and mobile assisted vocabulary learning. *Arab Word English Journal*, *8*(2), 16-35.

Athira, K. P., & Chacko, L. (2020). Metacognitive and mediated learning in visually impaired. *The International Journal of Indian Psychology*, *8*(4), 1003-1011.

Baars, M., & Viberg, O. (2023). Supporting metacognitive and cognitive processes during self-study through mobile learning.*Metacognition and Education: Future Trends.*

Bajaj, B., & Jain, S. (2020). Study of metacognitive ability emotional intelligence and social intelligence in relation to employees individual performance and team effectiveness. *Guru Gobind Singh Indraprastha University*. http://hdl.handle.net/10603/448887

Best, J.W., Kahn, J.V., & Jha, A.K. (2019). *Research in Education.* Pearson India education services Pvt Ltd. Noida.

Bhatnagar, S., & Sabharwal, S.P. (2021). Effect of mobile phone dependency on metacognition and social interest among young adults.*The International Journal of Indian Psychology, 9*(4).

Biswas, S., & Bhadra, B.K. (2022). Usage patterns of mobile phone and internet among marginalized college students a case study in Malda district West Bengal.*Jadavpur University* http://hdl.handle.net/10603/460363

Cer, E. (2019). The instruction of writing strategies: The effect of the metacognitive strategy on the writing skills of pupils in secondary education. *SAGE Open,*1-17

Cherry, K. (2023, August 16). Nomophobic: The fear of being without your phone. *Very well mind*. https://www.verywellmind.com/nomophobia-the-fear-of-being-without-your-phone-4781725

Cihanoglu, M.O. (2012). Metacognitive awareness of teacher candidates. *Procedia – Social and Behavioral Sciences, 46, 4529-4533*

Damopolii, I., & Kurniadi, B. (2019). Training students' metacognitive skill using mobile learning. *J. Phys.,1317,* (012185), 1-6. doi:10.1088/1742-6596/1317/1/012185

Das, A. (2015). Relationship between metacognitive ability and academic achievement of B.ed students-A study. *International Journal of Science and Research (IJSR)*. https://www.ijsr.net/archive/v6i5/ART20173554.pdf

Davey, S., & Davey, A. (2014). Assessment of smartphone addiction in Indian adolescents: A mixed method study by systematic-review and meta-analysis approach. *Int J Prev Med, 5*(12)

Diaz, I. (2015). Training in metacognitive strategies for students' vocabulary improvement by using learning journals. *PROFILE Issues in Teachers' Professional Development*, 17(1), 87-102.

Drigas, A., Karyotaki, M., & Skianis, C. (2023). Mobiles, digital tech, empathy, metacognition, self-consciousness and the role of parents in schools and societies of the future. *International Journal of Interactive Mobile Technologies, 17*(7). https://doi.org/10.3991/ijim.v17i07.37201

Dos, B. (2014). The relationship between mobile phone use, metacognitive awareness and
academic achievement. *International Journal of Environmental & Science Education*, *3*(4),192-200. http://dx.doi.org/10.15446/profile.v17n1.41632.

Drew, C. (August 18, 2023). Metacognitive theory: Definition, pros and cons. Helpful Professor. https://helpfulprofessor.com/metacognitive-theory/

Dubey, P., & kapoor, A. (2019). An investigation of academic emotions as facilitator of higher cognitive and metacognitive learning in higher secondary students. *Dayalbagh Educational Institute* *http://hdl.handle.net/10603/323822*

Ekanayake, S.Y., & Wishart, J. (2014). Integrating mobile phones into teaching and learning: A case study of teacher training through professional development workshops. *British Journal of Educational Technology*,*46*(1), 173-189.

Flavell, J. H (n.d.). Metacognition Theory. *Theories of Learning in Educational Psychology.* https://ojs.amhinternational.com/index.php/jevr/article/download/116/116

Flavell, J.H., & Wellman, H.M. (1975). Metamemory. *Minnesota of University*. https://files.eric.ed.gov/fulltext/ED115405.pdf

Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive–developmental inquiry. *American Psychologist, 34*(10), 906–911. https://doi.org/10.1037/0003-066X.34.10.906

Gentile, D. (2009). Pathological video-game use among youth ages 8 to 18: A National study. *Psychological Science, 20*(5), 594–602. https://doi.org/10.1111/j.1467-9280.2009.02340.x

Government of Nagaland, District Dimapur. Retrieved on 15th September, 2023 https://dimapur.nic.in/about-district/

Government of India, Central Board of School Education. https://www.cbse.gov.in/cbsenew/cbse.html

Government of India, Central Board of School Education. *GIS mapping of school.* https://cbseit.in/cbse/cbse_maps/udiselocatecbse

Gupta, P., & Bamel, U. (2023). Need for metacognition and critical thinking in the e-learning ecosystem: The new normal in post Covid era. *Global business and organizational excellence.*

Gurat, M.G. (2018). Mathematical problem-solving strategies among student teachers. *Journal on efficiency and responsibility in education and science, 11*(3), 53-64.

Ilci, A. (2014). Investigation of Pre-Service Teachers' Mobile Learning Readiness Levels and Mobile Learning Acceptance Levels. *The Graduate School of Natural and Applied Sciences of Middle East Technical University*.

Jaleel, S., & Premachandran, P. (2016). A study on the metacognitive awareness of secondary school students. *Universal Journal of Educational Research, 4*(1): 165-172.
https://files.eric.ed.gov/fulltext/EJ1086242.pdf

Kadian, A. (2016). Relation between academic achievement, executive function, intelligence and metacognition. *The International Journal of Indian Psychology, 3*(4), 166-174
https://ijip.in/wpcontent/uploads/ArticlesPDF/article_51e280e043a455e055d6693f271fe901.pdf

Kaliisa, R., & Picard, M. (2017). A Systematic Review on Mobile Learning in Higher Education: The African Perspective. The Turkish Online Journal of Educational Technology,16(1), 1-18.

Kumar, M. (2020). Achievement in mathematics in relation to attitude towards mathematics metacognition and learning styles of ninth class students of district Kapurthala Punjab. *Panjab University*.
http://hdl.handle.net/10603/317235

Kumar, N., & Gera, M. (2020). Academic procratination among the adolscents in relation to metacognition perfectionist and internet usage. *Panjab University*.
http://hdl.handle.net/10603/327916

Kumar, R.K. (2021). *Research methodology*. SAGE publications India Pvt. Ltd. New Delhi.

Koul, L. (2021). *Methodology of educational research*. Vikas publishing house Pvt Ltd. Noida.

Livingston, J. A. (2003). Metacognition: An Overview. Psychology, 13, 259-266.

Mandal, R., & Mete, J. (2023). A Study of platform preferences for social networks & its positive and negative aspects. *SSRN*. https://dx.doi.org/10.2139/ssrn.4437105

Marantika, J.E.R. (2021). Metacognitive ability and autonomous learning strategy in improving learning outcomes.*Journal of Education and Learning (EduLearn), 15*(1), 88-96

Ministry of Education, Governemnt of India. *National Education Policy, 2020*. https://www.education.gov.in/nep/about-nep

Montellado, C.J., & Lovitos, A.H.D. (2023) Metacognitive awareness and attitude towords communicative approach of junior high school students. *American Journal of Multidisciplinary Research and Innovation (AJMRI.),2*(1), 22-35. *https://doi.org/10.54536/ajmri.v2i1.1192*

Nagaland district map. Burning campus [Image]. (2023, September 25) https://www.burningcompass.com/countries/india/nagaland-district-map.html

Nat, M. C., Walker, S., Bacon, L., Dastbaz, M., & Flynn, R. (2011). Impact of metacognitive awareness on learning in technology enhanced learning environments.The University of Greenwich. (Unpublished)

NBSE. About NBSE. Retrieved on August, 20, 2023. https://nbsenl.edu.in/about-nbse

NBSE. General information . Retrieved on August, 20, 2023 https://nbsenl.edu.in/general-information

Negi, K.S., & Godiyal, S. (2019). A study of mobile phone usage by undergraduate students and its relationship to their personality and values. *Hemwati Nandan Bahuguna Garhwal University*. http://hdl.handle.net/10603/385541

Niwlikar, B. (2022, June 27). Metacognition: Concept, characteristics, knowledge and skills. *Career shodh*.

https://www.careershodh.com/metacognition-concept-characteristics-knowledge-and-skills/

Ng, S.F., Hassan, N.S.I.C., Nor, N.H.M., & Malek, N.A A. (2017). The relationship between smartphone use and academic performance: A case of students in a Malaysian tertiary institution. *Malaysian Online Journal of Educational Technology,5* (4), 58-70.

Noushad, P.P. (2008). Cognitions about cognitions: The theory of metacognition. *Farook Training College*. https://files.eric.ed.gov/fulltext/ED502151.pdf

Putchavayala, K. C., Sasidharan, K. R., Krishna, D., & Deepeshwar, S. (2023). Correlation between excessive smartphone usage, basic psychological needs, and mental health of university students. *Journal of Mental Health and Human Behaviour, 28*(1), 65-71.

Rajesh, E.B. (2021). A study on Meta cognition of secondary school students in relation to few variables. *International Journal for Research Trends and Innovation*, *6*(10), 127-132.

Rani, R., & Deswal, Y.S. (2019). Study habits social competence and general well being in relation to mobile phone usage among senior secondary school students.*Maharshi Dayanand University.* *http://hdl.handle.net/10603/301863*

Rani, R., & Govil, P. (2013). Metacognition and its correlates: A study. *International Journal of Advancement in Education and Social Sciences, 1(*1), 20-25.

Rekha, C.J. (2017). Use of mobile phones and the awareness of its health hazards among higher secondary students.*VISTAS, 6*(1), 61-70. https://stjosephs.edu.in/upload/papers/1864c3347c642d3015a66ca53ef34304.pdf

Sabarsish, B. (2014). Metacognition. *Arafa Institute of teacher Education*. *http://sabarishedn.blogspot.com/2014/01/bed-notes-metacognition.html*

Sabna, E.P., & Hameed, A. (2016). Metacognitive awareness for enuring learning outcomes among the higher secondary stduents. *IOSR Journal Of Humanities And Social Science (IOSR-JHSS)* 21(4), 101-106. *https://www.iosrjournals.org/iosr-jhss/papers/Vol.%2021%20Issue4/Version-2/N210402101106.pdf*

Schraw, G., & Moshman, D. (1995). Metacognitive theories. *Educational Psychology Review,7*(4), 351–371.

Singh, K., & Kumar, J. (2014). Metacognition among senior secondary students in relation to their problem solving ability and self esteem. *Maharshi Dayanand University* http://hdl.handle.net/10603/37316

Songa, N.S., & Kamal, K.P. (2023). Study of the effect of mobile phone tower radiation a different slected plant species. *YBN University.* http://hdl.handle.net/10603/507774

Sonowal, M., & Kalita, M. (2019). Metacognitive awareness and academic achievement of higher secondary level arts stream students of Dibrugarh district, Assam. *International Journal of Humanities and Social Scienc, 6*(4), 17-23.

Stel, M.V., Veenman, M.V.J., Deelen, K., & Haenen, J. (2010). The increasing role of metacognitive skills in math: A cross-sectional study from a developmental perspective. ZDM Mathematics Education, 42(2), 219–229

Sudiatama., Firman, E., Dehghani, S., & Zamorano, A. (2023). The efficacy of mobile-assisted language learning in improving learners' reading skills in relation to metacognitive strategy. *Journal of Language and Literature Studies, 3*(1), 53–66.
https://doi.org/10.36312/jolls.v3i1.992

Sundari, T. (2015). Effects of mobile phone use on academic performance of college going young adults in India. *International Journal of Applied Research, 1*(9), 898-905.

https://www.allresearchjournal.com/archives/2015/vol1issue9/PartN/1-9-82-277.pdf

Sunday, O.J., Adescope, O.O., & Maahuis, P.L. (2021).The effects of smartphone addiction on learning: A meta-analysis. *Computers in Human Behavior Reports,4.* 1-9.
https://doi.org/10.1016/j.chbr.2021.100114

Thomee, S., Harenstam, A., & Hagberg, M. (2011). Mobile phone use and stress, sleep disturbances and symptoms of depression among young adults- A perspective cohort study.
https://doi.org/10.1186/1471-2458-11-66

Official state portal Government of Nagaland: People culture. Retrieved September 10, 2023 from
https://nagaland.gov.in/

Onat, M. (2012). Metacognitive awareness of teacher candidates. Procedia social and behavioral sciences, 46, 4529-4533.

Ozcakmak, H., Koroglu, M., Korkmaz, C., & Bolat, Y. (2021). The effect of metacognitive awareness on academic success. *African Educational Research Journal,9(2), 434-448.*

White, J., & Mills, D.J. (2012). Examining attitudes towards and usage of smartphone technology among Japanese university students studying EFL. *CALL-EJ, 15*(2), 1-15

Wilmer, H.H., Sherman, L.E., & Chein, J.M.(2017). Smartphones and cognition: A review of research exploring the links between mobile technology habits and cognitive functioning. *Frontiers in psychology*. https://doi.org/10.3389/fpsyg.2017.00605

Woodcock, B., Middleton, A., & Nortcliffe, A. (2012). Considering the smartphone learner: An investigation into student interest in the use of personal technology to enhance their learning. *Student Engagement and Experience Journal, 1*(1), 1-15. http://dx.doi.org/10.7190/seej.v1i1.38

Zulkiply, N. (2006). Metacognition and its Relationship with Students' Academic Performance.

APPENDICES

APPENDIX –I

PLAGIARISM REPORT

Document Information

Analyzed document	azung all to check P final.docx (D174848016)
Submitted	2023-09-29 07:00:00
Submitted by	Rashmi
Submitter email	rashmi@nagalanduniversity.ac.in
Similarity	0%
Analysis address	rashmi.naga@analysis.urkund.com

Sources included in the report

W	URL: https://www.sciencedirect.com/science/article/pii/S2451958821000622 Fetched: 2021-08-05 14:27:31	1
W	URL: https://files.eric.ed.gov/fulltext/EJ1214011.pdf Fetched: 2020-11-25 12:41:47	1
W	URL: https://files.eric.ed.gov/fulltext/EJ1156718.pdf Fetched: 2020-11-17 16:38:03	1
W	URL: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9368281/ Fetched: 2022-11-26 14:24:24	2
W	URL: https://elibrary.tucl.edu.np/bitstream/123456789/9931/2/chapter%281%29.pdf Fetched: 2022-07-03 14:53:30	1

Entire Document

METACOGNITIVE ABILITY OF SECONDARY SCHOOL STUDENTS IN RELATION TO USAGE OF MOBILE PHONE IN DIMAPUR DISTRICT

A Dissertation submitted on partial fulfillment of the requirement for the award of the degree of Master of Philosophy (M.Phil) in Education

Submitted by I.AZUNGLA IMSONG Roll no.05/2021 Registration no.89/2022

Under the supervision of Dr Rashmi Assistant Professor Department of Teacher Education Nagaland University

DEPARTMENT OF TEACHER EDUCATION NAGALAND UNIVERSITY KOHIMA CAMPUS, MERIEMA, NAGALAND-797004

SEPTEMBER, 2023

APPENDIX- II: TOOL-1

METACOGNITIVE ABILITY

Part –A
Personal data

Personal Details

Name-_____

Gender- Girl ☐ Boy ☐

Age-_____

Class- 9th ☐ 10th ☐

Institution Management type- Private ☐ Govt. school ☐

Board- NBSE ☐ CBSE ☐

Name of the school-_____

Part-B

INSTRUCTIONS

On the following pages 50 statements concerning your actions in different situations has been given. Read each statement carefully and decide your answer by putting a [✓] mark against one of the five alternatives, viz, strongly agree(SA), agree (A), undecided (UD), disagree(D) and strongly disagree(SD) in the box which describes you the best.

Sr. no	Statements	SA	A	UD	DA	SA	SCORE
1.	I follow a particular strategy to learn effectively						
2.	I rethink whether the strategy I am following if effective or not						
3	I know my caliber and learn accordingly						
4	I break the content of study into smaller steps						
5	I easily learn a topic if I have some previous knowledge about it.						
6	I learn important information easily						
7	I don't pay attention to trivial things.						
8	I check myself at times whether I have understood the topic or not.						
9	I organize information in my mind.						
10	I draw pictures and diagrams to learn a topic						
11	Before attempting any task, I read the instructions carefully.						
12	I pause regularly to check my knowledge						

13	I can always motivate myself to learn.						
14	I keep asking questions to myself about how well I am doing						
15	I make learning more meaningful and interesting with examples.						
16	I can take help from others in understanding difficult concepts.						
17	In times of confusion, I stop and reread the material.						
18	If any information is not clear, I switch over to new information.						
19	I focus on general meanings than the particular ones.						
20	Once I finish a task, I keep asking myself whether I learned as much as I could have.						
21	I check my work while doing it.						
22	I try to understand the task before I attempt to solve it.						
23	I use multiple thinking techniques or strategies to solve the task.						
24	I am aware of my ongoing thinking processes.						
25	I plan everything in my mind before attempting a task and work accordingly.						
26	I dislike any kind of disturbance while studying						
27	I do not involve myself in other tasks while studying.						
28	I memorize what I learned for longer time						
29	I follow my own style of studying						
30	I do not like any kind of disturbance in my time schedule.						
31	I change my strategy of learning when I feel it is not working.						
32	I ask myself about how well I am learning something new.						
33	I know the usefulness of learning strategies I use						
34	I try to find out the cause of my failure and attempt it again with more confidence.						
35	I know my strengths and weaknesses related to my intellect						
36	After finishing a test, I know what I have done.						
37	I know which information is important for learning.						
38	I am aware of what my teachers expect me to achieve.						

39	While studying, I am of the strategies I use.						
40	I have control over my learning.						
41	I learning more effectively by reciting the material.						
42	I try understand the material well while doing my homework.						
43	I try to put together the information from the class and from other sources while studying.						
44	I keep on analyzing the usefulness of strategies while studying.						
45	The speed of my learning slows down when I come across something new.						
46	I feel happy on getting high score than my classmates.						
47	I feel happy when I gain deed understanding of concepts.						
48	On getting high grades in assessment, I feel as if I have mastered learning						
49	I know how to compensate my weaknesses.						
50	I know that I am careless regarding my studies.						

APPENDIX-III: TOOL-2

USAGE OF MOBILE PHONE

Directions: Dear Students, The researcher is currently conducting a research entitled, *"Metacognitive ability of secondary school students in relation to usage of Mobile phone"*. Please answer the questionnaire honestly by ticking (✓) in the appropriate boxes only or by filling in the blanks. Your responses will be treated with utmost concern and confidentiality.

Personal Details

Name-_____

Gender- Girl ☐ Boy ☐

Age-_____

Class- 9th ☐ 10th ☐

Institution Management type- Private school ☐ Government school ☐

Board- NBSE ☐ CBSE ☐

Name of the school-

_____

Questionnaire

1. **You use mobile phone mostly for**

Educational purpose related	
Calls/text messages	
Social media	

2. **I place my cell phone on silent mode/flight mode while studying**

No, never	
Rarely	
Sometimes	
Often	
Yes, always	

3. **I started using mobile phone since early morning**

Completely Disagree	
Disagree	
Neither agree nor Disagree	
Agree	
Completely agree	

4. **What is the amount of time on daily basis you spend on mobile phone?**

1-2 Hours	
3-4 hours	
5-6 hours	

If more, specify_____

5. **Which one do you prefer the most during leisure time?**

Spend more time with family and friends	
To be socially active	
Use mobile phone	
Study	

6. **How often do you check your mobile phone?**

When get a notification	
Every 15 minutes	
Every 30 minutes	
When necessary/get time	

7. **I have the fear of being without a cell phone in my life.**

Completely Disagree	
Disagree	
Neither agree nor disagree	
Agree	
Completely agree	

8. **I am interacting less because of cell phone.**

Completely Disagree	
Disagree	
Neither agree nor disagree	
Agree	
Completely agree	

9. **I have lied to my parent to go out with them so that i could spend more time in cell phone at home.**

Completely Disagree	
Disagree	
Neither agree nor disagree	
Agree	
Completely agree	

10. **I have ignored people in order to use phone.**

Completely Disagree	
Disagree	
Neither agree nor disagree	
Agree	
Completely agree	

11. **Do you play online games in your mobile phone?**

Yes	
No	

12. **I play online mobile games mostly with my**

Family	
friends	
Unknown person	

13. **How many Mobile games app do you have in your phone?**

None	
One	
Two	
Three	
More than three	

14. **How much time on daily basis do you spend playing game on mobile phone?**

0-30 Minutes	
1-2 hours	
3-4 hours	
5-6 hours	
More than 6 hours	

15. **I can live a day without using/surfing my social media account.**

Completely Disagree	
Disagree	
Neither agree nor disagree	
Agree	
Completely agree	

16. **How much time on daily basis do you spend on social media?**

1hour	
2 hours	
3 hours	
More than 3 hours	

17. **At what age did you open your social media account?**

5-10 years	
11-15 years	
16- 20 years	

18. **You use Youtube for**

Watching videos for entertainment	
Watching videos for educational purposes	

19. **I can control/restrict myself watching videos/movies in my mobile phone**

Completely Disagree	
Disagree	
Neither agree nor disagree	
Agree	
Completely agree	

20. **I spend over time in watching videos or movies on the mobile phone.**

Completely Disagree	
Disagree	
Neither agree nor disagree	
Agree	
Completely agree	

21. **What is the amount of time you spend on watching videos/movies on the mobile phone?**

0-31 Minutes	
1-2 hours	
3-4 hours	
5-6 hours	

If more Specify, _____ hours

APPENDIX-IV: TOOL-3

AWARENESS OF MOBILE PHONE

1. **I have thought about negative effects of using mobile phone.**

No, Never	
Seldom/Rarely	
Sometimes	
Often	
Yes, Always	

2. **I am aware of health problem that are caused by excessive use of cell phone.**

Not at all aware	
Slightly aware	
Moderately aware	
Very aware	
Extremely aware	

3. **Have you ever experience any of this due excessive use of cell phone.**

Nausea	
Vomiting	
Fatigue	
Insomnia	

If others, specify_____

4. **Use of mobile phone have affects my concentration level in study.**

Completely Disagree	
Disagree	
Neither agree nor disagree	
Agree	
Completely agree	

5. **I am aware that due to excessive gaming can affect my health**.

Not at all aware	
Slightly aware	
Moderately aware	
Very aware	
Extremely aware	

6. **Are you aware of the age restriction to use some social media (like facebook/instragram/twitter) ?**

Not at all aware	
Slightly aware	
Moderately aware	
Very aware	
Extremely aware	

7. **I think educational videos in internet are helpful/important while studying.**

Not at all aware	
Slightly aware	
Moderately aware	
Very aware	
Extremely aware	

8. **How often do you watch Educational videos for your study?**

No, never	
Rarely	
Sometimes	
Often	
Yes, always	

9. **How often do you use educational videos to understand concepts well for your study?**

No, never	
Rarely	
Sometimes	
Often	
Yes, always	

10. **Educational videos on You tube can retain learning longer.**

Completely Disagree	
Disagree	
Neither agree nor disagree	
Agree	
Completely agree	

11. **Watching video/ movies late hours can affect the health and study.**

Not at all aware	
Slightly aware	
Moderately aware	
Very aware	
Extremely aware	

NAGALAND UNIVERSITY

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

Department of Teacher Education
School of Humanities & Education
Kohima Campus, Meriema - 797 004

Certificate of Participation

This is to certify that Mr./Mrs./Ms./Dr./Prof. I. Azungla Imsong

Department of Teacher Education, NU: Kohima

has participated/Presented a paper

entitled Metacognitive Approach: An innovation in teaching and learning process at the school level.

in the **National Seminar on Social Transformation in India 2.0 and NEP-2020** held from 21st to 22nd April, 2022 organised by Department of Teacher Education, School of Humanities & Education, Nagaland University, Kohima Campus, Meriema, Nagaland-797 004.

Prof. A.K.Mishra
Pro-Vice Chancellor
Kohima Campus

Prof. Buno Zetsuvi
Dean
School of Humanities and Education

Prof. P.K.Pattnaik
Head
Dept. of Teacher Education

Dr.Rashmi
Convener