USAGE OF SMART PHONE AMONG STUDENT TEACHERS IN TEACHING LEARNING AND ASSESSMENT

BY

Uma Maheswari V

REG.NO. 22PED002

UNDER THE GUIDANCE OF

Dr. C. KARTHIK DEEPA

A THESIS SUBMITTED TO THE

AVINASHILINGAM INSTITUTE FOR HOME SCIENCE AND HIGHER EDUCATION FOR WOMEN, COIMBATORE- 641043.

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF EDUCATION

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CERTIFIED AS BONAFIDE THESIS WORK

Signature of Guide 9/5/24 Signature of Head of Department 9/5/24 Signature of Dean 09/05/24

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Chapter 1

Introduction

"Smartphones are not just gadgets. They have become an extension of our being, a key to the world we live in."
- Jerry Yang, co-founder of Yahoo!

We don't have a choice on whether we use smartphones. The choice is how we use them."
- Catherine Price, author of "How to Break Up with Your Phone"

1.1 Introduction

The widespread adoption of smartphones among students has revolutionized modern education. This introduction delves into the pervasive use of smartphones in student life, exploring their multifaceted roles as learning tools, communication devices, and sources of information. It examines the impact of smartphone usage on academic performance, social interaction, and the evolving landscape of education in the digital era.

The ubiquitous presence of smartphones has fundamentally transformed the educational landscape, profoundly impacting how students engage with learning and interact with their environment. In recent years, these handheld devices have transcended their traditional role as communication tools, evolving into indispensable companions in the pursuit of knowledge.

Students wield smartphones as versatile instruments, seamlessly integrating them into various aspects of their academic journey. From accessing educational resources and conducting research to collaborating with peers and organizing study materials, smartphones have become indispensable aids in the learning process. The convenience and accessibility afforded by these devices empower students to personalize their learning experiences, catering to their individual preferences and learning styles.

However, the pervasive use of smartphones also brings forth challenges and concerns. The potential for distraction, over-reliance on instant gratification, and issues related to digital literacy and online safety underscore the need for a nuanced understanding of smartphone usage among students.

Against this backdrop, understanding the dynamics of smartphone usage among students is paramount for educators, policymakers, and stakeholders in the education sector. By critically examining the opportunities and challenges associated with smartphone usage, this research aims to inform strategies that harness the transformative potential of technology to enhance student learning outcomes and foster digital citizenship in the 21st century.

1.2 History of Development of Mobile Phone Technology

The history of mobile phone technology is a fascinating journey marked by significant milestones and innovations that have revolutionized communication and transformed society. It all began with the invention of the first handheld mobile phone by Martin Cooper, an engineer at Motorola, in 1973. This device, known as the Motorola DynaTAC 8000X, weighed nearly 2 pounds and offered a talk time of just 30 minutes.

Throughout the 1980s, mobile phones evolved from bulky devices primarily used by business professionals to more compact and affordable models accessible to a wider audience. The introduction of the 1G (first generation) cellular networks in the early 1980s laid the groundwork for widespread mobile communication, albeit with limited capabilities and coverage.

The 1990s witnessed rapid advancements in mobile phone technology, with the introduction of digital networks such as GSM (Global System for Mobile Communications) and CDMA (Code Division Multiple Access). These technologies enabled clearer voice calls, faster data transmission, and the introduction of text messaging.

The turn of the millennium heralded the era of smartphones, with the launch of devices like the Nokia 9000 Communicator and the BlackBerry 850. These early smartphones combined mobile communication with computing capabilities, offering features such as email access, web browsing, and basic productivity tools.

The introduction of the iPhone by Apple in 2007 revolutionized the smartphone industry, ushering in a new era of touchscreen interfaces, app ecosystems, and multimedia capabilities. Subsequent years saw the rise of Android smartphones, powered by Google's operating system, further diversifying the market and driving innovation.

Today, mobile phone technology continues to evolve at a rapid pace, with advancements in areas such as 5G connectivity, artificial intelligence, augmented reality, and biometric authentication shaping the future of communication and computing on the go. From humble beginnings as a bulky handheld device to a ubiquitous companion that empowers individuals and connects the world, the history of mobile phone technology exemplifies the transformative power of innovation.

1.3 Status of Mobile Phone Users Till 2023

As of 2023, the global status of mobile phone users continued to reflect a trend of widespread adoption and increasing reliance on mobile technology across diverse demographics and regions. With the proliferation of smartphones and the expansion of mobile networks, the number of mobile phone users worldwide surpassed significant milestones, reflecting the essential role these devices play in modern society.

Key trends and statistics up to 2023 include:

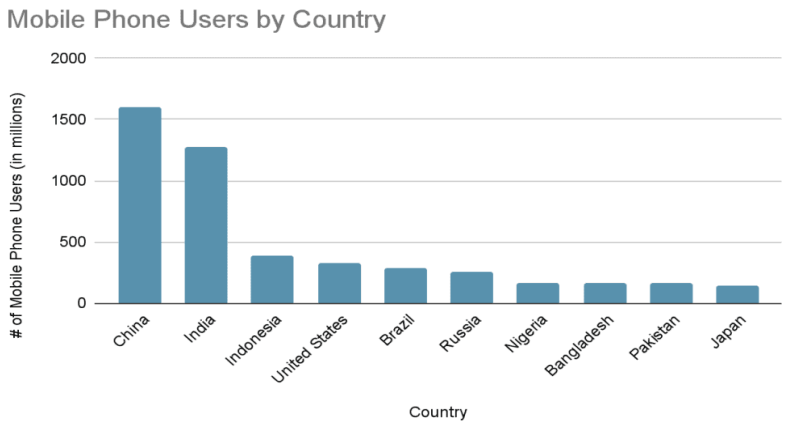
- Global Penetration: The number of mobile phone users worldwide continued to rise, with a significant portion of the global population owning and using mobile devices for various purposes, including communication, entertainment, productivity, and accessing online services.
- Smartphone Dominance: Smartphones remained the primary type of mobile device, driving the growth of mobile internet usage and enabling access to a wide range of applications and services. The increasing affordability and accessibility of smartphones contributed to their widespread adoption.
- Mobile Internet Usage: The popularity of mobile internet usage continued to soar, fuelled by the growing availability of high-speed mobile networks, such as 4G LTE and the emerging 5G technology. Mobile users increasingly relied on their devices to access the internet, social media platforms, streaming services, and e-commerce websites.
- Shift towards Mobile Commerce: The rise of mobile commerce (m-commerce) continued, with an increasing number of consumers using their smartphones to shop online, make payments, and engage in financial transactions. This trend reshaped the retail landscape and spurred innovation in mobile payment solutions and digital wallets.
- Emerging Technologies: Mobile phone users embraced emerging technologies such as augmented reality (AR), virtual reality (VR), and artificial intelligence (AI), which enriched the mobile experience and

opened up new possibilities for entertainment, gaming, education, and productivity.

- Digital Divide Concerns: Despite the widespread adoption of mobile technology, concerns persisted regarding the digital divide, with disparities in access to mobile devices and internet connectivity affecting underserved communities and regions. Efforts to bridge this gap through initiatives promoting digital inclusion and affordable access to mobile technology remained ongoing.

Overall, the status of mobile phone users until 2023 underscored the transformative impact of mobile technology on global connectivity, communication, and lifestyle, while also highlighting the need to address challenges related to accessibility, affordability, and digital equity.

Figure 1.1 Mobile phone user's across countries



1.4 Smart Phones in Education

Smartphones have become integral tools in education, offering a myriad of benefits for students, educators, and institutions alike. Here are some key ways smartphones are transforming education:

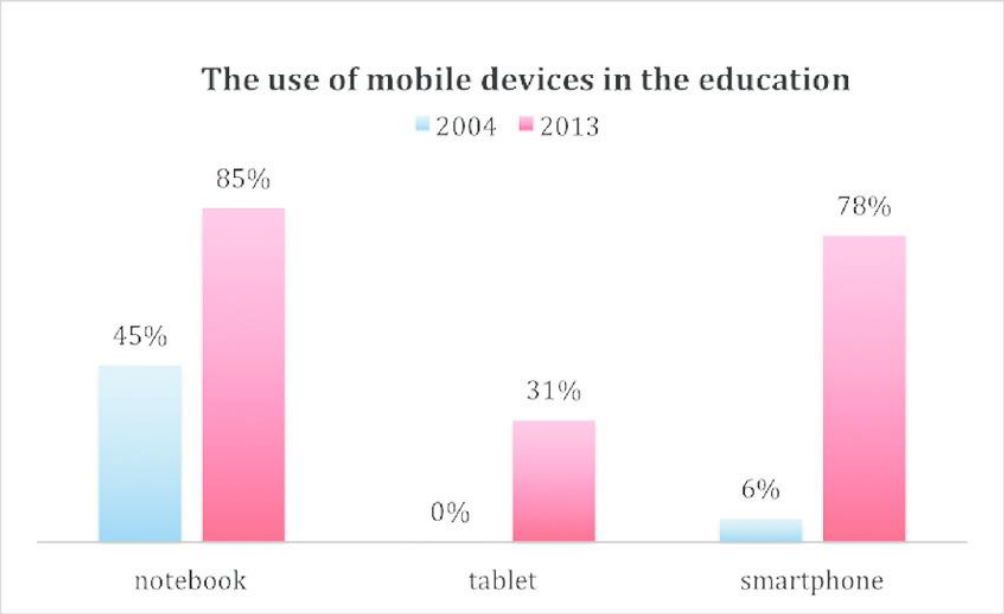
- Access to Information: Smartphones provide instant access to a vast array of educational resources, including e-books, research articles, videos, and educational apps. Students can easily supplement their learning by accessing information anytime, anywhere.
- Collaborative Learning: Smartphones facilitate collaboration among students through messaging apps, social media platforms, and

collaborative tools. They can share notes, collaborate on projects, and participate in group discussions, regardless of their physical location.

- Personalized Learning: Educational apps and adaptive learning platforms leverage smartphone technology to deliver personalized learning experiences tailored to individual students' needs, preferences, and learning styles. This helps optimize learning outcomes and student engagement.
- Enhanced Communication: Smartphones enable seamless communication between students, teachers, and parents. Teachers can send announcements, provide feedback, and facilitate discussions through messaging apps or learning management systems, fostering a more connected learning environment.
- Multimedia Learning: Smartphones support multimedia learning experiences by allowing students to access educational videos, podcasts, simulations, and interactive content. This multimedia approach enhances comprehension, retention, and engagement with course material.
- Productivity Tools: Students can use smartphones to manage their schedules, set reminders, and organize study materials using productivity apps and digital tools. This helps improve time management, task prioritization, and overall productivity.
- Remote Learning: Smartphones have played a crucial role in facilitating remote learning during times of school closures or disruptions, allowing students to attend virtual classes, complete assignments, and collaborate with peers from home.
- Digital Citizenship: Integrating smartphones into education provides opportunities to teach students about responsible digital citizenship, including online safety, privacy, critical thinking, and ethical use of technology.

While smartphones offer numerous benefits in education, it's essential to address challenges such as digital distractions, privacy concerns, and the digital divide to ensure equitable access and maximize their educational potential. By leveraging smartphones effectively, educators can create dynamic, engaging learning experiences that prepare students for success in the digital age.

Figure 1.2 Use of smart phone in education



1.5 Statement of the problem

The present study investigates **"Usage of Smart Phone among Student Teachers in Teaching Learning and Assessment"**

1.6 Objectives of the study

The main aim of the study is to examine the use of mobile phones among student teacher's in the age group of 20 – 40 years. The specific objectives of the study are:

- The primary objective of the study is to find the usage of Smart Phones among Student Teachers in Teaching Learning and Assessment
- The secondary objective of the study is to find the influence of variables in the usage of Smart Phones among Student Teachers in Teaching Learning and Assessment

1.7 Hypotheses of the study

A hypothesis in a study is a testable statement or prediction about the relationship between two or more variables. It is an educated guess that guides the research process and helps researchers investigate specific phenomena.

Hypotheses are typically formulated based on existing knowledge, theories, or observations, and they provide a framework for designing and conducting research experiments or studies. The hypothesis of the present study is stated below.

Usage of smartphone among student teachers in teaching, learning and assessment

- There is no significant difference between usage of smart phone in teaching learning, assessment and gender of the student teacher
- There is no significant difference between usage of smart phone in teaching learning, assessment and Age of the student teacher
- There is no significant difference between usage of smart phone in teaching learning, assessment and Level of education of the student teacher
- There is no significant difference between usage of smart phone in teaching learning, assessment and Year of Education of the student teacher
- There is no significant difference between usage of smart phone in teaching learning, assessment and Subject Major of the student teacher
- There is no significant difference between usage of smart phone in teaching learning, assessment and Medium of instruction at college of the student teacher
- There is no significant difference between usage of smart phone in teaching learning, assessment and Type of Institution of the student teacher
- There is no significant difference between the General usage pattern, Teaching and Learning, Preparation of Teaching Content, Extra courses and Examination and connectivity and Data Storage.

- There is no significant difference between usage of smart phone in teaching learning, assessment and Smart phone usage access and experience.

1.8 Variables of the study

Variables in research refer to characteristics or attributes that can vary or change, and are measured, manipulated, or controlled in a study. Variables are essential components of research as they help researchers understand relationships between different phenomena and make inferences about the outcomes of their investigations. The variables used in our study are detailed below.

Dependent Variable

- Usage of Smart phone in teaching, learning and assessment

Independent Variable

The independent variables involved in the study of the study

- Age
- Gender
- Level of education
- Subject Major
- Medium of instruction at college
- Type of Institution
- Smart phone usage access and experience

1.9 Methodology

The type of research is Survey method. The random sampling technique is used for the data collection. The size of the sample is 500 student teachers. The tool used for the research is a self-made questionnaire.

The questionnaire was constructed with a total of 106 questions. The pilot study was conducted with 31 student teachers to find the reliability of the questionnaire.

Reliability established for the questionnaire with the reliability coefficient of 0.70 (A reliability of 0.70 is often considered adequate for group studies (Rammstedt, 2004)) by using Cronbach's Alpha method.

Validity was established with the help of subject experts. After the pilot study 78 questions were taken for the final questionnaire

1.10 Significance of the study

The study on smartphone usage in teaching, learning, and assessment holds significant implications for education in the modern era. Here are several reasons why such research is important:

- Ubiquity of Smartphones
- Accessibility and Equity
- Engagement and Motivation
- Personalized Learning
- Flexibility and Convenience
- Assessment Innovation 21st Century Skills Development
- Professional Development for Educators

Overall, the study on smartphone usage in teaching, learning, and assessment is significant for harnessing the potential of technology to transform education, promote equity and accessibility, enhance student engagement and motivation, support personalized learning experiences, innovate assessment practices, develop 21st-century skills, and empower educators to effectively leverage technology in their instructional practices.

1.11 Limitation of the study

While studying smartphone usage in teaching, learning, and assessment offers numerous benefits, it also comes with several limitations. The present study is limited to 500 student teachers studying in the Government, Private and Aided Teacher Training Institutions located Coimbatore district.

1.12 Chapter Scheme

- Chapter 1: It deals with the Introduction of the topic, the history Of Development of Mobile Phone Technology, Status of Mobile Phone Users Till 2023, Smart Phones in Education. Then moves on with the statement of the problem, the objective of the study, the hypothesis of the study, the

methodology adapted for the study and the significance and the limitations of the study.

- Chapter 2: It covers the review related to the literature.

- Chapter 3: Methodology – It provides details of the method adopted for the study.

- Chapter 4: It shows the analysis and interpretation of the data collected.

- Chapter 5: Conclusion – It reports the outcome of the product after compilation.

1.13 Conclusion

The conclusion of this chapter marks a pivotal moment in the research journey, consolidating key elements introduced in the preceding sections. It highlights the foundational role of the introduction in framing the research problem, objectives, and significance within the broader academic context. By providing a roadmap for the study, the introduction sets the stage for rigorous inquiry and scholarly exploration. Emphasizing the relevance and timeliness of the research, the conclusion underscores its potential contributions to theory, practice, and policy.

REVIEW OF RELATED LITERATURE

Chapter 2

Review of Related Literature

2.1 Introduction

> "Literature adds to reality, it does not simply describe it. It enriches the necessary competencies that daily life requires and provides; and in this respect, it irrigates the deserts that our lives have already become."
> - C. S. Lewis

A literature review is a thorough examination and analysis of existing research and scholarly literature on a specific topic or research question. It serves multiple purposes, including identifying the current state of knowledge, highlighting gaps and research questions, providing theoretical frameworks, guiding methodological choices, preventing duplication of effort, and supporting argumentation and discussion in research papers. The process involves defining the scope and objectives, identifying relevant sources, evaluating and synthesizing sources, organizing the review, analysing and interpreting findings, writing the review, and citing sources properly. A well-conducted literature review is essential for establishing the context of research, identifying areas for further investigation, and contributing to the advancement of knowledge in a particular field.

2.2 Purpose of Literature Review

The purpose of a literature review in academic research is multifaceted, aiming to fulfil several important objectives:

- To Provide Context: A literature review contextualizes the research by summarizing existing knowledge and research findings on the topic. It sets the stage for the research by demonstrating the current understanding of the subject area.
- To Identify Gaps: By examining existing literature, researchers can identify gaps, inconsistencies, or unanswered questions in the literature. This helps in formulating research questions and hypotheses for further investigation.

- To Establish the Need for the Study: A literature review justifies the need for the research by demonstrating that there are unanswered questions or areas where further investigation is warranted. It explains why the research is important and how it contributes to the existing body of knowledge.
- To Guide Methodological Choices: Literature reviews inform researchers about the various methodologies, data collection techniques, and analytical approaches used in previous studies. This information helps researchers make informed decisions about research design and methodology.
- To Provide Theoretical and Conceptual Frameworks: Literature reviews contribute to the development of theoretical and conceptual frameworks for research projects. They help researchers situate their work within the broader context of existing theories and models.
- To Prevent Duplication of Effort: Conducting a literature review ensures that researchers are aware of previous studies and findings related to their topic of interest. This prevents duplication of effort and allows researchers to build upon existing knowledge rather than reinventing the wheel.
- To Support Argumentation and Discussion: A well-conducted literature review provides evidence and support for the arguments and discussions presented in research papers, theses, or dissertations. It helps in establishing the credibility and validity of the research findings.

2.3 Importance of Literature Review

The importance of a literature review in academic research cannot be overstated. Here are several key reasons why literature reviews are crucial:

- **Contextualization**: Literature reviews provide the necessary context for the research by summarizing existing knowledge and research findings on the topic. They help researchers understand the historical development, theoretical frameworks, and key debates in the field.
- **Identifying Gaps and Research Questions**: By critically examining existing literature, researchers can identify gaps, inconsistencies, or unanswered questions. This process informs the formulation of research questions and hypotheses, guiding the direction of the study.
- **Justification and Significance**: Literature reviews justify the significance and relevance of the research by demonstrating the need for further

investigation. They explain why the research is important and how it contributes to advancing knowledge in the field.

- **Methodological Guidance**: Literature reviews inform researchers about the methodologies, data collection techniques, and analytical approaches used in previous studies. This helps researchers make informed decisions about research design and methodology.
- **Theoretical Framework**: Literature reviews contribute to the development of theoretical and conceptual frameworks for research projects. They help researchers situate their work within the broader context of existing theories and models, providing a foundation for analysis and interpretation.
- **Prevention of Duplication**: Conducting a literature review ensures that researchers are aware of previous studies and findings related to their topic of interest. This prevents duplication of effort and allows researchers to build upon existing knowledge rather than reinventing the wheel.
- **Quality Assurance**: Literature reviews help ensure the quality and rigor of research by providing evidence and support for the arguments and discussions presented in research papers. They demonstrate that the research is grounded in established scholarship and contributes to the ongoing discourse in the field.
- **Critical Thinking and Synthesis**: Engaging with existing literature requires critical thinking skills and the ability to synthesize information from multiple sources. Literature reviews help researchers develop these skills, enhancing their ability to evaluate and interpret research findings.

2.4 Reviews

1. Wang, J.C., Hsieh, CY. & Kung, SH. The impact of smartphone use on learning effectiveness: A case study of primary school students. *Educ Inf Technol* 28, 6287–6320 (2023). https://doi.org/10.1007/s10639-022-114309

The literature on the relationship between smartphone behavior and academic performance among primary school students reveals contrasting findings and identifies key limitations. While some studies suggest a positive correlation between high smartphone use and academic performance, others warn of the detrimental effects of excessive smartphone use on learning outcomes. Common limitations include small sample sizes, a lack of causality in correlational

analyses, and insufficient exploration of mediating variables. Future research should address these limitations by increasing sample diversity, adopting robust methodologies, and exploring the role of mediating variables. The implications of existing research extend to educators, parents, and policymakers, who can use insights to develop strategies for responsible smartphone use and support student success in the digital age.

Wang, J.C., Hsieh, CY. & Kung, SH. (2023): Investigated the impact of smartphone use on learning effectiveness among primary school students, highlighting varying findings and limitations in existing research.

2. The Use of Smartphones as an Educational Tool in the Classroom: Lecturers' Perceptions https://doi.org/10.3991/ijet.v15i16.14179 Ahmad Zahir Wali (*), Mohammad Ehsan Omaid

The study explores lecturers' perceptions of smartphones as educational tools in the classroom, as well as the benefits and barriers associated with student smartphone use. Using a quantitative research design, data was gathered from 50 lecturers at Kandahar University through a questionnaire. Analysis using descriptive statistics in SPSS v24 software revealed several key findings. Lecturers generally support the use of smartphones as educational tools in the classroom, except for social media usage. They perceive student smartphone use to benefit learning in various ways, and there were no significant perceived barriers to students' smartphone use in the classroom according to the lecturers' perspectives.

Ahmad Zahir Wali & Mohammad Ehsan Omaid (Year not provided): Explored lecturers' perceptions of smartphones as educational tools in classrooms, finding general support for their use except for social media, with perceived benefits to learning.

3. The impact of smartphones on undergraduate students in the faculty of education, University of Port Harcourt

Rebecca Oluwayimika Kasumu Williams Ore-Ofe Hannah

The review discusses a study investigating the influence of smartphones on undergraduate students in the Faculty of Education at the University of Port Harcourt, particularly focusing on the human kinetics and health education program. Utilizing a descriptive survey methodology, the study surveyed 120 first-year students out of 188, employing a structured questionnaire with validated

and reliable measures. Through rigorous analysis, the study reveals that smartphones enhance accessibility to information, aid in academic tasks, and offer customizable engagement options. It suggests integrating smartphones into classroom settings for improved communication and learning experiences. Overall, the study provides valuable insights into the transformative potential of smartphones in undergraduate education, emphasizing the importance of leveraging them to enrich learning environments and support academic success.

Noah Darko-Adjei's study investigates the utilization and impact of smartphones on distance learning students at the University of Ghana, Legon. Grounded in the Technology Acceptance Model, the research involves 294 respondents and employs surveys to explore students' perceptions and experiences. The study finds that smartphones are generally perceived as easy to use and beneficial for academic activities. However, technical issues like freezing and poor connectivity, along with ergonomic limitations, pose challenges to their effectiveness. Despite these hurdles, the study highlights smartphones' potential in enhancing distance education but emphasizes the need to address technical and usability issues for optimal integration into learning environments.

Rebecca Oluwayimika Kasumu Williams Ore-Ofe Hannah (Year not provided): Explored the influence of smartphones on undergraduate students at the University of Port Harcourt, highlighting their positive effects on accessibility to information and academic tasks.

Noah Darko-Adjei (Year not provided): Investigated the utilization and impact of smartphones on distance learning students at the University of Ghana, Legon, finding perceived benefits but also technical and ergonomic challenges.

4. Mobile Phones for Teaching and Learning: Implementation and Students' and Teachers' Attitudes Farooq AlTameemy, 2017

Mobile phones have become so ubiquitous that they turned into an important part of our life. According to Parsons, mobile subscriptions exceed 6 billion subscriptions globally. Similarly, Ipsos and Verizon (as cited in Tan & El-Bendary) found out that adopting mobile phones with smart technologies has increased fast which also coincided with a more utilization of their Internet capabilities. With the abundance of knowledge the Internet provides, mobile phones become an invaluable pathway for that knowledge. The fact that these gadgets are well-liked by students make them one of the best tools to be adopted by educational institutions. This study will investigate the actual academic use of mobile phones among students and teachers, their attitudes toward using them as

learning or teaching tools, and if there is a significant difference in attitudes of the participants toward using mobile as learning or teaching tools based on the job criteria (Student vs. Faculty Member).

Farooq AlTameemy (2017): Examined the use of mobile phones for teaching and learning, emphasizing their popularity among students and potential as educational tools.

5. Kumar, R. and Kaur, A. 2006.Internet Use by Teachers and Students in Engineering Colleges of Punjab, Haryana and Himachal Pradesh: An Analysis. Electronic Journal of Academic and Special Librarianship, vol-7. Retrievedfromhttps://www.researchgate.net/publication/323666033_Internet_Use_by_Teachers_and_Students_in_Engineering_Colleges_of_Punjab_Haryana_and_Himachal_Pradesh_An_Analysis. Accessed on 12/02/2014

Mobile phones and the internet in social settings may have beneficial and malignant effects. In 2006, educators and students in the Indian states of Punjab, Haryana, and Himachal Pradesh conducted an online survey. The survey was given to 1980 students and faculty members across the three engineering institutions in India. This research exhibits and expands upon numerous facets of internet use, including: internet use frequency; internet usage purpose; internet usage location; internet usage contentment; and internet usage satisfaction at the collegiate level. Researchers found that 46.7% of educators and 36.7% of pupils often access the web in the classroom. As time went on, it became clear that the majority of respondents relied heavily on the Internet in their academic endeavours.

Kumar, R. and Kaur, A. (2006): Explored internet use by teachers and students in engineering colleges of Punjab, Haryana, and Himachal Pradesh, highlighting the prevalence and importance of internet access for academic purposes.

6. El-Gayar, O. et al. 2011. Students Acceptance of Tablet PCs and Implications for Educational Institutions. Educational Technology & Society. Vol 14, Issue 2. P. 58-70.

In advanced technological societies, mobile phones hold symbolic meaning. The mobile phone has become a communicative and informational device in recent iterations. Due to the convenience and portability of mobile Internet connectivity, smartphone users may take a mini-computer with them everywhere they go. People have the frequent urge to check for communication, seek out information,

and direct their opinion to other people and worlds in their presence.9 College students between the ages of 18 and 25 who took courses in different disciplines were surveyed by El Gaydar, O. et al. to evaluate their attitudes toward and use of technology (including their smartphones and laptops), as well as their expectations regarding performance, behaviour, social influence, ease of participation, and the perceived difficulty of completing assignments. The results indicated that individual attitudes toward the technology itself mainly influenced the utilization and acceptance of this new technology in the students' studies.

El-Gayar, O. et al. (2011): Investigated college students' acceptance of tablet PCs and implications for educational institutions, emphasizing the influence of individual attitudes on technology utilization.

7. Suri, G. and Sharma, S. 2012. Impact of Age and Internet Access and Usage on Student's Attitude Towards E-learning: A Study on Punjab University. International Journal of Applied Services Marketing Perspectives. Vol- 1, P. 188-194.

College students' handling of the internet and other forms of information and communication technology is examined by Sinha, M. K. et al. Users' Internet use was found to have an impact on classroom activities, research projects, laboratory activities, and written and spoken presentations. Studies of this nature revealed that modern students viewed the internet as a great resource for finding the data required by scholars and scientists. Academic library patrons were strongly encouraged to participate in the training sessions suggested by the study's authors. Then students would be able to make better use of the web for research and class work. Most of the students tried to stay current by visiting the library, but they were unable to get the resources they needed. For young inquisitive minds, the internet can be a gold mine of information. It was also discovered that students were drawn to the internet because of the ease with which they could get information on any subject. Most students complain about the internet's poor speed and sluggish performance.11 The study by Suri, G. and Sharma, S. shows that internet use has a major effect on respondents, whereas respondents' opinions about e learning had little bearing on their own internet habits. The vast majority of respondents are keen on gaining computer skills and have a favourable impression of online education.

Suri, G. and Sharma, S. (2012): Examined the impact of age and internet access on students' attitudes toward e-learning at Punjab University, highlighting the importance of internet use for academic activities.

8. Challa, N. & Madras, V. 2014. Attitude, Awareness and Usage Skills of Computer and Internet among Medical Students. IOSR Journal of Dental and Medical Sciences (IOSR-JDMS). Volume 13, Issue 5, P. 24 27.

Challa, N. & Madras, V. research in India concluded that most medical students were not using the internet to learn new things. Instead of learning about their subjects, most students use the internet for entertainment purposes including listening to music, playing video games, watching movies, and connecting with friends on social networking sites. The study's author also suggested that the web's potential future impact on the medical field merits serious consideration. In order to help students, make the most of it for their future and education, careful attention must be paid to guiding their use of it. They also argued that all medical schools should use computers to educate students how to effectively use the Internet as a research tool.

Challa, N. & Madras, V. (2014): Explored the attitudes and usage skills of computer and internet among medical students, emphasizing the need for guidance in effective internet use for educational purposes.

9. Lajwanti and Sharma, A. P. 2013. Effect of Internet Use on Study Habits and Adjustment of Higher Secondary Students. International Journal of Educational Research and Technology. IJERT: Vol 4(1). P. 52 -59.

Researchers Lajwanti and Sharma from A. P. did not find any substantial differences between internet users and non-users with regards to their study habits or ability to adapt to new environments in this study, we found no evidence that students' homework habits, grades, or coping techniques were affected by their exposure to sex, punishment, or internet use/non-use. The study concluded that non-internet users (who made up 99 percent of the sample) fared better than internet users (who made up 1 percent of the sample) on every measure of adjustment. They found no evidence to support the idea that students' adjustment was unaffected by whether or not they used the internet. Students in the arts were found to have poor adjustment, while those in the sciences performed around average.

Suri, G. and Sharma, S. (2012): Examined the impact of age and internet access on students' attitudes toward e-learning at Punjab University, highlighting the importance of internet use for academic activities.

10. Halder, D. and K.Karuppannan, J. 2013. Use and Misuse of Internet by Semi-Urban and Rural Youth in India, A Baseline Survey Report". Centre for Cyber Victim Counselling. Retrieved from URL: http://www.cybervictims.org. Accessed on 12/02/2014.

Researchers in India revealed that adolescents used the internet to download obscene shears, pictures, pornography, manipulate information, and send unwanted messages to each other in rural areas. The significant objectives of internet use were entertainment and having fun. Teens in urban and rural areas have different levels of familiarity with online privacy and safety regulations. Knowledge levels were found to be lower in rural children compared to their urban counterparts. Most students used material found on the internet when doing their homework and assignments. Internet abuse was found to be more prevalent among rural adolescents compared to their urban counterparts because rural kids were found to be more apathetic and less aware of the significance of the concerns. Because of their naiveté and lack of experience, they frequently engage in such behaviour. The study focussed on the need of teaching teenagers about the potential pitfalls of online activities. Again, teenage internet use was adequate, but they lacked a solid foundation of knowledge and awareness of cybercrime. They were oblivious to issues of privacy and plagiarism. Students saw obscene videos on YouTube and other sites, according to the survey, but many avoided doing so at home because of parental concerns. Most students were worried about getting in trouble with the law for engaging in illicit online activity. The researcher wished that pupils would have prior knowledge of cybercrime. This will help kids learn to be responsible members of society while also raising awareness of the dangers of cybercrime.

Halder, D. and K.Karuppannan, J. (2013): Conducted a baseline survey on the use and misuse of the internet by semi-urban and rural youth in India, highlighting differences in internet usage patterns and awareness of online safety.

11. Mahajan, P. 2006. Internet Use by Researchers: A Study of Punjab University. Chandigarh, Library Philosophy and Practice. Vol. 8, No. 2.

According to Mahajan P.'s study, kids' attitudes about schoolwork were significantly impacted by the widespread availability of the Internet. Students in the science departments accounted for 100% of campus Internet usage. Students in the humanities and social sciences often saw the university library as a last resort when conducting research. Nearly 90% of students in the poll said they

would rather use the Internet than a library for their research. In contrast, humanities and social sciences students used the library more than the internet.

Mahajan, P. (2006): Explored internet use by researchers at Punjab University, revealing a preference for internet over library resources among science students.

12. Kochhar, S. et al. 2013. Knowledge and Usage of Internet among different professional students in India. Universal Journal of Education and General Studies. (ISSN: 2277-0984), Vol. 2(7). P. 233-238.

The research conducted revealed that both postgraduate (PG) and graduate (M. Phil.) students made use of the internet for academic reasons. Conversely, most undergraduates spent their time online for leisure and socialising. Students universally complained about the service's sluggish data transmission rates. Students were also found to be aware of the internet cafe's existence (90.6 percent), but not particularly interested in using it. Due to a lack of institutional access, engineering students in India were found to spend much more time online than their non-engineering peers, according to a survey conducted by Kochhar S. et al. To make the most of online materials, pupils needed access to the internet, background knowledge, and computer literacy. Many students said they had trouble locating the information they needed on the web and that they preferred to utilise it at home. The vast majority of students surveyed reported using the internet for social media (Facebook, WhatsApp, etc.) and electronic mail. Fewer students favoured using the internet to get answers to their academic questions, although many respondents said they did use the internet to get electronic books for class.19A vital relationship was demonstrated between internet usage between gender and among several professional students.

Kochhar, S. et al. (2013): Examined knowledge and usage of the internet among professional students in India, highlighting differences in internet usage patterns based on gender and educational level.

13. Bianchi, A. and Phillips, J. 2005. Psychological Predictors of Problem Mobile Phone Use. Cyber Psychology and Behavior. Vol 8(1). P. 39-51.

Research published as early as 2005 by Bianchi, A. and Phillips, J. suggested difficulties with mobile phone use might be symptomatic of a lack of impulse control or depressed mood. Their research looked at both the root cause and the consequences of excessive cell phone use. They predicted mobile phone addiction using a number of dependent factors, including self-reported weekly mobile

phone usage, self-reported proportion of socially based service, self-reported rate of use for business, etc. The percentage of reported use for additional features was one of the additional factors taken into account. Based on the findings, technological dependency is a reasonable place to begin thinking about issues related to mobile phone use. The findings also suggest that young individuals are more vulnerable to heavy and problematic substance use. Too much time is spent texting and using other mobile phone functions.

Bianchi, A. and Phillips, J. (2005): Investigated psychological predictors of problem mobile phone use, identifying factors such as lack of impulse control and depressed mood.

14. Hooper, V. and Zhou, Y. 2007. Addictive, Dependent, Compulsive? A Research of Mobile Phone Use. A paper presented at the 20th Bled e-Conference e-Mergence: Merging and Emerging Technologies, Processes and Institutions, Bled, Slovenia. Retrieved from https://pdfs.semanticscholar.org/42c2/42742d84f0c76a64a709e9203c2dbf4846d7.pdf. Accessed on 12/02/2014.

According to research college and university students who believe they are addicted to texting have a variety of psychological and behavioural symptoms. Self-reported measures of text message dependence, text message frequency, and psychological and behavioural symptoms were analysed. Perceived emotional reaction, excessive use, and relationship maintenance were the three components of perceived text message reliance.28 Researchers Hooper, V., and Zhou, Y., discovered a wide range of mobile-related behaviours among college students. There are six possible manifestations based on identified drivers. The words "addictive," "mandatory," "compulsive," "dependent," "habitual," and "voluntary" all apply to these. These classifications were put to the test via a survey. Research showed that whereas compulsive usage was quite important, addictive use was the lowest. Furthermore, the findings demonstrated that mobile phone use is more appropriately classified as compulsory, optional, or reliant than as frequent, addicted, or compulsive.

Hooper, V. and Zhou, Y. (2007): Explored addictive, dependent, and compulsive mobile phone use among college students, finding variations in mobile-related behaviors and perceived emotional reactions.

15. Nalwa, K. and Anand A. P. 2003. Internet Addiction in Students: A Cause of Concern. Cyberpsychology Behaviour. Vol 6, issue 6. P. 653-656. 32 Goel, D. et al. 2013. A Study on The Prevalence of Internet Addiction and its Association With Psychopathology in Indian Adolescents. Indian Journal of Psychiatry. Vol 55, Issue 2, P. 140-143.

The internet, according to Nalwa, K. and Anand, A. P., has become an addictive medium for students. The Davis Online Cognition Scale (DOCS) was employed by the researchers to evaluate students' problematic internet behaviour. Two groups were made based on total scores gathered from 100 respondents: non-dependents and dependents, respectively. The research shows that the distinctions between the two groups may be put to good behavioural and practical advantage. The reliant group discovered that their internet activities were delaying their job and causing them to lose sleep. A small number of respondents said that they would find life without the Internet to be uninteresting. The dependents spent significantly more time online than the controls. In terms of feelings of isolation, those who rely on others scored higher than those who did not.31 It was discovered that internet addicts are different from the general population in that they prefer to use the internet late at night and early in the morning. Access to the internet was also found to vary, based on the results. Finding no correlation between daily usage and addiction levels was another major finding from the study. Internet addicts frequently spent more time online than they had budgeted for. Addicts who spent excessive time on the Internet had symptoms of poor mental and physical health.

Nalwa, K. and Anand A. P. (2003): Explored internet addiction in students, identifying factors such as delayed job completion and feelings of isolation among internet-dependent individuals.

16. Hakama, M. and Hakoyama, S. 2011.The Impact of Cell Phone Use on Social Networking and Development among College Student. The American Association of Behavioural and Social Sciences. Vol 15. P. 1-20.

Gender was shown to be associated with mobile phone use, according to research by Walsh, S.P. et al. Several social scientists looked at the opinions and attitudes of mobile phone users across the gender spectrum. They concluded that whereas females had overwhelmingly favourable opinions of the service, males had a negative bias toward it overall, regardless of the setting. 35 Research by Hakama, M., and Hakoyama, S. reveals significant disparities in mobile phone use based on gender. Their research revealed that females, and particularly white females,

are more likely to rely heavily on their mobile devices to keep in touch with friends and family.36 According to research conducted by Pawowska, B. and Potembska, E., there is a strong correlation between these factors and continuing friendships with peers.

Hakama, M. and Hakoyama, S. (2011): Investigated the impact of cell phone use on social networking and development among college students, highlighting gender differences in mobile phone use and its effects on friendships.

17. Thanuskodi, S. 2013. Gender Differences in Internet Usage among College Students: A Comparative Study. Philosophy and Practice (e-journal). from https://pdfs.semanticscholar.org/30d0/ca3173fb1906b5a37ac32d023c6ec0545605.pdf. Accessed on 05/06/2018.

Research by Perry, S., and Lee, K. shows no statistically significant difference in mobile phone use by gender. Male and female college students in the developing world do not differ in their propensity to engage in addictive behaviours, although women are less likely to utilise text messaging than men. Gender did not seem to be a reliable predictor of mobile phone usability problems, while women did tend to have more frequent issues. Admitting that women's addiction may be governed by their culture or ethnicity, they say that this may be the case. Gender inequality in the West is not as pervasive as it is in Asia and Japan, where women are implicitly expected to maintain traditional gender roles.39 According to ThanuskodiS.'s findings, internet use is equally common between males and females. Equal access to the Internet was available to both boys and girls, but their online habits differed. Because of widespread usage of the internet in schools, the solution was the same for both genders. At home, girls and boys utilised the internet in different ways because parents did not allow them equal access.

18. Abu-Jedy A. 2008. Mobile Phone Addiction and Its Relationship with Self-Disclosure among Sample of Students from the University of Jordan and Amman Al-Ahliyya University. Jordan Journal of Educational Science. Vol 4, Issue 2. P. 137-50.

It was observed in a 2014 survey conducted by Sharma, A. et al. among 391 university students in India that male students were more hooked to internet use than female students. Boys and girls alike logged an average of 1.29 hours each day online. Only 0.3% of students were severely dependent on the internet, while

the rest exhibited mild, frequent, or moderate dependence. Students' difficulties, especially in their professional studies, were shown to rise with their internet use, according to the study's findings. Policy and practise aimed at reducing the risk of internet addiction promotes responsible and productive online use.41 In 2008, Abu-Jedy A. conducted research into the relationship between mobile phone addiction and honesty among Jordanian college students. The study also looked at the reasons for the lengths of time spent on cell phones, as well as the personalities of addicted pupils. One quarter of a sample was found to have high levels of addiction. Addiction affects twice as many women as men, according to the study. Private university students have a substantially greater rate of internet addiction than their public university counterparts.

Abu-Jedy A. (2008): Explored mobile phone addiction and its relationship with self-disclosure among Jordanian college students, finding higher addiction rates among female students and those attending private universities.

19. Hakama, M. and Hakoyama, S. 2011.The Impact of Cell Phone Use on Social Networking and Development among College Student. The American Association of Behavioural and Social Sciences. Vol 15. P. 1-20.

Gender was shown to be associated with mobile phone use, according to research by Walsh, S.P. et al. Several social scientists looked at the opinions and attitudes of mobile phone users across the gender spectrum. They concluded that whereas females had overwhelmingly favourable opinions of the service, males had a negative bias toward it overall, regardless of the setting. 35 Research by Hakama, M., and Hakoyama, S. reveals significant disparities in mobile phone use based on gender. Their research revealed that females, and particularly white females, are more likely to rely heavily on their mobile devices to keep in touch with friends and family.36 According to research conducted by Pawowska, B. and Potembska, E., there is a strong correlation between these factors and continuing friendships with peers.

Hakama, M. and Hakoyama, S. (2011): Investigated the impact of cell phone use on social networking and development among college students, highlighting gender differences in mobile phone use and its effects on friendships.

20. Guan, S. S. A. and Subrahmanyam. K. 2009. Youth Internet use: Risks and Opportunities. CurrOpin Psychiatry. Vol 22, Issue 4, P. 351-356. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/19387347. Accessed on 12/02/2014.

Studies by Guan, S. S. A., and Subrahmanyam, K. show that cyberbullying, sexual solicitation, and internet addiction are real problems among young people. They insisted it was crucial to remember that not every kid was in the same precarious position. To develop efficient solutions, further research into risk and reward was required. Internet use may promote growth in all three areas of development (social, physical, and mental). It was clear, then, that the Internet posed both benefits and threats to the youth of today. They suggested studying which young people were most vulnerable to online bullying, addiction, and solicitation in order to better tailor preventative measures. They argued that the Internet might be utilised to enhance youth education and leadership development because to its many useful aspects.

Guan, S. S. A. and Subrahmanyam. K. (2009): Explored the risks and opportunities of youth internet use, emphasizing the importance of understanding individual vulnerabilities and tailoring preventative measures.

2.5 Research Gap

The research presented covers a wide range of topics related to smartphone and internet use among students, including their impact on academic performance, perceptions of educators, effects on learning habits, and psychological predictors of excessive use. However, despite the breadth of research, several research gaps can be identified:

1. Causality and Longitudinal Studies: Many studies mentioned are cross-sectional or descriptive in nature, lacking longitudinal data to establish causality. Long-term studies tracking students' smartphone and internet usage habits over time could provide deeper insights into the effects on academic performance, social development, and psychological well-being.
2. Mediating Variables: While some studies acknowledge the need to explore mediating variables, few delve deeply into identifying and understanding these factors. Exploring variables such as socio-economic status, parental influence, personality traits, and educational environment could provide a more comprehensive understanding of the relationship between smartphone/internet use and student outcomes.

3. Contextual Factors: The studies vary in geographical location, cultural context, and educational systems, but there's a lack of comparative research examining how these factors influence smartphone and internet use patterns among students. Understanding how cultural norms, societal expectations, and educational policies impact technology usage could inform more targeted interventions.
4. Methodological Rigor: Some studies rely solely on self-report surveys, which may be subject to biases and inaccuracies. Future research could benefit from incorporating objective measures of smartphone and internet usage, such as screen time tracking apps or observational methods, to validate self-reported data.
5. Understudied Populations: Many studies focus on college or university students, neglecting younger age groups (e.g., primary and secondary school students) or specific demographic groups (e.g., students with disabilities, rural populations). Research addressing the unique challenges and opportunities of these understudied populations would contribute to a more inclusive understanding of technology use among students.
6. Intervention and Policy Implications: While some studies discuss implications for educators, parents, and policymakers, few offer specific recommendations for interventions or policy changes. Future research could focus on developing and evaluating evidence-based interventions aimed at promoting responsible smartphone and internet use among students and informing educational policies at institutional and governmental levels.

Addressing these research gaps could lead to a more nuanced understanding of the complex relationship between smartphone/internet use and student outcomes, ultimately informing more effective strategies to support students' academic success and well-being in the digital age.

2.6 Relationship and Differences

The mentioned studies collectively provide insights into various aspects of technology use, particularly smartphones and the internet, among students and educators. Each study focuses on different facets of technology integration in educational settings, such as its impact on learning outcomes, attitudes toward technology use, and patterns of usage among different demographic groups.

In the context of "Usage of Smart Phones among Student Teachers in Teaching Learning and Assessment," which is not explicitly described in the provided information, we can draw potential relationships and differences based on the themes and findings of the existing studies:

Relationships:

1. Attitudes Towards Technology: Many of the studies explore students' and educators' attitudes toward technology use in education. Understanding these attitudes can provide insights into the acceptance and integration of smartphones in teaching, learning, and assessment practices among student teachers.
2. Impact on Learning Outcomes: Several studies investigate the impact of smartphone and internet use on learning effectiveness and academic performance. These findings can inform discussions about the potential benefits or drawbacks of using smartphones for teaching, learning, and assessment purposes among student teachers.
3. Patterns of Technology Use: Studies examining patterns of smartphone and internet use among students and educators can shed light on how student teachers are currently using technology in educational contexts. This information can help understand the existing practices and preferences that may influence the adoption of smartphones for teaching, learning, and assessment.

Differences:

1. Focus of the Study: Each study has a specific focus, ranging from exploring attitudes toward technology to investigating the impact of smartphone use on learning outcomes. The "Usage of Smart Phones among Student Teachers in Teaching Learning and Assessment" study may have a narrower focus on how student teachers specifically use smartphones in their teaching, learning, and assessment activities.
2. Context and Participants: The context and participants of each study vary, influencing the generalizability of findings. The "Usage of Smart Phones among Student Teachers in Teaching Learning and Assessment" study may focus on student teachers in a particular educational setting or region, providing context-specific insights into smartphone usage patterns.

3. Methodology and Findings: Variations in research methodologies and findings across studies may lead to differences in conclusions and recommendations. The "Usage of Smart Phones among Student Teachers in Teaching Learning and Assessment" study may employ specific research methods to explore smartphone usage behaviors and their implications for teaching, learning, and assessment practices among student teachers.

Overall, while the existing studies offer valuable insights into technology use in education, the specific study on the "Usage of Smart Phones among Student Teachers in Teaching Learning and Assessment" would provide tailored insights into the role of smartphones in the professional development and practices of student teachers.

2.7 Conclusion

Literature reviews are connected carefully and presented. Without reviewing literature, it would be difficult to build a body of knowledge on the educational topic. Review of literature helps the investigator to know what lines to proceed to make the effect a successful and useful endeavor. It guides the investigator to select the correct procedure at the time of investigation. Finally, these reviews give information, which can aid and support or challenge the conclusion of the investigator’s research and therefore provide clues for later research.

METHODOLOGY

Chapter 3

Methodology

3.1 Introduction

The successful outcome of research depends upon the methodology adopted. The selection of methods for research work depends upon the tools and techniques the researcher uses. This Chapter presents a description of the research process. It provides information concerning the way that was used in data collection. The Chapter also describes the variables of the study, sampling technique used, and development of the tool (questionnaire).

3.2 Educational Research

Educational research is a multifaceted field focused on improving teaching and learning practices, informing educational policies, and advancing theoretical understanding in education. Key aspects of educational research include investigating effective teaching methods, developing assessment tools, informing curriculum development, influencing educational policy and reform, studying the role of technology in education, examining social and cultural contexts, supporting teacher training and professional development, and exploring the impact of parent and community involvement. Overall, educational research aims to enhance educational practices, promote equity and access, and improve student outcomes at all levels of education.

3.3 Purpose of Educational Research

The purpose of education research is to systematically investigate various aspects of the educational process, institutions, and policies with the aim of improving educational practices, informing policy decisions, and advancing theoretical understanding. Here are some key purposes of education research:

- Improving Teaching and Learning: Education research seeks to identify effective teaching methods, learning strategies, and instructional approaches that enhance student outcomes and academic achievement. It investigates how different pedagogical techniques, classroom environments, and educational technologies impact student learning.

- Informing Educational Policy and Reform: Education research provides evidence-based insights that inform policymaking at local, national, and international levels. It evaluates the effectiveness of educational policies, programs, and interventions, and provides recommendations for improving educational systems and addressing societal challenges.
- Enhancing Curriculum Development: Research in education informs the development, evaluation, and revision of curricula across various subjects and levels of education. It examines curriculum design, content standards, alignment with learning objectives, and the integration of new knowledge and skills to meet the needs of diverse learners.
- Supporting Assessment and Evaluation: Education research develops and evaluates assessment tools and methods to measure student learning outcomes, assess educational programs, and monitor progress towards educational goals. It explores the validity, reliability, and fairness of assessment practices and identifies ways to improve assessment processes.
- Exploring Social and Cultural Contexts: Education research examines the social, cultural, and institutional factors that influence educational practices and outcomes. It investigates issues of equity, diversity, inclusion, and social justice in education, and explores how socio-economic, cultural, and demographic factors shape educational experiences and opportunities.
- Advancing Educational Technology: Research in education explores the use of technology in teaching and learning, including the design, implementation, and evaluation of educational software, online platforms, and digital resources. It investigates how technology can enhance access, engagement, and effectiveness in education.
- Supporting Professional Development: Education research contributes to the development of effective professional development programs and teacher training initiatives. It examines strategies for improving teacher effectiveness, promoting lifelong learning among educators, and fostering collaboration and reflective practice in educational settings.
- Engaging Stakeholders and Communities: Education research involves stakeholders such as educators, policymakers, parents, students, and community members in the research process. It promotes dialogue, collaboration, and shared decision-making to address educational challenges and opportunities**.**

3.4 Survey Method

The survey method is a popular research technique used to collect data from a specific group of people, known as the sample, in order to gain insights into various phenomena. Surveys typically involve asking participants a series of questions, either in person, over the phone, through mail, or online. This method is commonly used in social sciences, marketing research, and various other fields to gather information about attitudes, opinions, behaviours, preferences, and other characteristics of a population.

There are different types of surveys, including:

1. Questionnaires: Participants respond to written or electronic questions.
2. Interviews: Researchers conduct face-to-face, phone, or video interviews to gather responses.
3. Online Surveys: Participants complete surveys via the internet, often through email or on websites.
4. Mail Surveys: Participants receive questionnaires by mail and return them via postal service.

Surveys can be structured (with fixed-response options) or unstructured (allowing open-ended responses), depending on the research objectives and the type of data needed. They can also employ various sampling techniques to ensure the sample represents the target population accurately.

While surveys are an efficient way to collect data from a large number of people, researchers must carefully design them to ensure validity, reliability, and representativeness of the sample. Additionally, ethical considerations such as informed consent and confidentiality are essential when conducting surveys involving human participants.

3.5 Method used in the study

The method used in the current study is the survey method under which the samples are given the questionnaire in the form of Google forms. The participants respond through the same.

3.6 Variables used in the study

Variables in research refer to characteristics or attributes that can vary or change, and are measured, manipulated, or controlled in a study. Variables are essential components of research as they help researchers understand relationships between different phenomena and make inferences about the outcomes of their investigations. The variables used in our study are detailed below.

Dependent Variable

- Usage of Smart phone in teaching, learning and assessment

Independent Variable

The independent variables involved in the study of the study

- Age
- Gender
- Level of education
- Subject Major
- Medium of instruction at college
- Type of Institution
- Smart phone usage access and experience

3.7 Sampling Technique

The sampling technique used by the investigator in the current study is the simple random sampling. The data is collected from the selected collages (student teachers) studying B.Ed. in private, aided and government colleges in Coimbatore.

3.8 Samples selected for the study

The samples selected for the present study are the first and second year student teachers doing their B.Ed. in private aided and government colleges in Coimbatore.

3.9 Development of the Tool

The tool used for the study is a self-made tool by the investigator. The tool is a questionnaire comprising of 78 questions. The validly and the reliability of the tool was found out.

The tools used for the present study are

Personal data sheet (Designed by the Investigator)

Smart Phone usage questionnaire (Designed by the Investigator)

3.10 Validity and Reliability of the tool

Preparation of the test items:

Smart phone usage questionnaire was constructed by the investigator by referring books, journals and internet resources and different aspects of research attitude were kept in mind and were written and the tool was constructed which consisted of 106 items.

The draft pool of items for assessing research attitude was written in English. The draft was then given to the experts for their opinion to establish content validity and face validity.

Juries' opinion

In order to find out the validity related to research attitude the investigator consulted the experienced teachers and experts in the field of research and the tool was given to them. Based on their idea, slight modifications were made.

Pilot study

Pilot study was conducted by administrating the tool for a sample of 30 student teachers. The data collected for the pilot study was used for the item analysis.

Reliability

"Reliability means the degree to which a test or tool measure something consistently"-(Garret, 2005)

Reliability was established for the questionnaire with the reliability coefficient of 0.70 (A reliability of 0.70 is often considered adequate for group studies (Rammstedt, 2004)) by using Cronbach's Alpha method. The reliability was established using the SPSS package.

Validity

"A test is valid when it measures truly and accurately the ability or quality one wants to appraise" "-(Garret, 2005)

In this study the content validity was found by systematically analysing the content area under study. In the opinion of experts, this test possessed face validity. Hence the face validity and content validity was established for the tool constructed.

3.11 Method of data collection

Through the random sampling technique the data was collected from student teachers of 7 different institutions (private, Government, Aided), through the Google forms.

Table 3.1 Sample Framework

Type of College	Female		Male	
	1st Year	2nd Year	1st Year	2nd Year
Government	101	101	0	0
Private	113	101	5	17
Aided	69	86	4	3
Total	283	288	9	20

Data was collected from a total of 600 student teachers

3.12 Statistical Technique

The data was consolidated, tabulated and analysed statistically using the following descriptive measures and different analysis**.**

- Mean
- Standard deviation
- Percentile analysis
- Test of significance
- Analyses of variance (ANOVA)
- Correlation

Mean

The mean is the Arithmetical average that is obtained by adding all the scores in a distribution and dividing by the number of scores. Symbols other than, have been to represent the mean for the instance M and N.

Standard deviation

The measure describes how scores vary about the mean scores. Hence the name standard deviation mathematically, the standard deviation is equal to square root of the sum of the square deviation about the mean divided by the number of scores.

Test of significance

The t-test is used to compare to groups .The study gets the paired t test to compare the teaching methods. The paired t test is use when each data point in one group which corresponds to a matching data point in the other group.

Analyses of variance (ANOVA)

The analysis of variance is a powerful statistical tool for test of the significance of t-distribution is an adequate procedure only for testing the significance of the difference between two sample mean. According to Prof. R.A. Fisher, analysis of variance (ANOVA) IS "separation of variance ascribable to group of causes from the variance as variable to other group.

3.13 Conclusion

In conclusion, the methodology chapter has served as the compass guiding our research journey, providing a detailed roadmap of the processes and procedures employed to achieve our study's objectives. Through a meticulous selection of research methods, including [mention specific methods used], we have endeavoured to ensure the validity, reliability, and rigor of our investigation. By delineating the rationale behind our methodological choices, addressing potential limitations, and detailing the steps taken to mitigate biases and ensure ethical integrity, we have strived to establish a robust framework for inquiry.

Moreover, the methodological decisions made in this chapter have been driven by a keen awareness of the unique nuances and complexities inherent in our research context. Whether navigating the intricacies of data collection, sampling techniques, or analytical approaches, we have remained attuned to the exigencies of our research questions and the intricacies of our chosen field of study.

ANALYSIS AND INTERPRETATION

Chapter 4

ANALYSIS AND INTERPRETATION

4.1 Introduction

The data collected was organized in order to discover inherent facts these data are studied from as many angles as possible to explore the new facts or to reinterpret already known existing facts.

"Interpretation means an adequate exposition of the true meaning of the material presented in terms of the study reported and of the chapter and selection or topic involved" -(Whitney,2005)

The challenge is to make sense of massive amounts of date, reduce to volume of information ,identify significant patterns and construct a framework for communicating the essence of what the processes is impossible .There are no tests of reliability and validity. There are no commonly agreed upon procedures for the task.

The analysis and interpretation of data involve the objective material in the possession of the researcher and his subjection reactions and desires to derive from the data the inherent meanings in their relations or interpretations from insufficient or invalid data. The final analysis must be anticipated in detail when plans are being made for collecting information.

In the presents study, data were collected from 600 student teachers. The information gathered from the sample through the rating scale and questionnaire are quantified and interpreted here. The aims of analysis are:

- To understand the data
- To get the meaningful base to critical decisions
- To verify the hypothesis
- To create a complete dissertation proposal
- To get quantitative and qualitative method of data results
- To explore the findings of the research
- To write the conclusion and summary

Interpretation of data refers to that important part of the investigation which is associated with the drawing of inferences from the collected facts after an analytic

study .It is extremely useful and important part of the study, because it makes possible use of collected data.

The different statistical procedures adopted are given in the following heads.

- Descriptive Analysis
- Different Analysis

4.2 Descriptive analysis

Descriptive analysis gives an overall idea about the sample distributed in the given population. It limits generalization to the particular group of individuals observed. No conclusions are extended beyond this group, and any similarity to those outside the group cannot be assumed .The data describe one group and that group only. Descriptive analysis provides valuable information about the nature of a particular group of individuals. (Best &Kahn, 2006)

4.3 Differential analysis

Differential analysis helps in the inference and prediction of results. Generalizations are done by using differences in means, standard deviations and standard errors. Among the various techniques t-test and ANOVA are used for the present study.

SECTION -1

DESCRIPTIVE ANALYSIS

TABLE 4.1

DISTRIBUTION OF SAMPLE BASED ON THE VARIABLES

S.no	Variables	Categories	No. Of students. (n=600)	Percentage
1	Age	20-25	523	87
		26-30	53	9
		31-35	11	2
		36-40	13	2
2	Gender	Male	29	4.8
		Female	571	95.2
3	Type of Institution	Government	202	33.7
		Aided	162	27
		Private	236	39.3
4	Year of Education	First	292	48.7
		Second	308	51.3
5	Level of Education	UG	395	66
		PG	205	34
6	Subject Major	Arts	278	46
		Science	322	54
7	Medium of Instruction	Tamil	111	18.5
		English	489	81.5

TABLE 4.2

DISTRIBUTION OF THE SAMPLE BASED ON AGE

S.No.	Age	Number of students	Percentage
1	20-25	523	87
2	26-30	53	9
3	31-35	11	2
4	36-40	13	2
Total		600	100

The above table reveals the age wise information of the selected sample. Among 600 students 87% of the students were in the age group of 20-25, 9% of students were in the age group of 26-30, 2% of the students were in the age group of 31-35 and 2% were in the age group of 36-40 in the selected samples for the study. The majority of the students are from age group of 20-25.

FIGURE 4.1

DISTRIBUTION OF THE SAMPLE BASED ON AGE

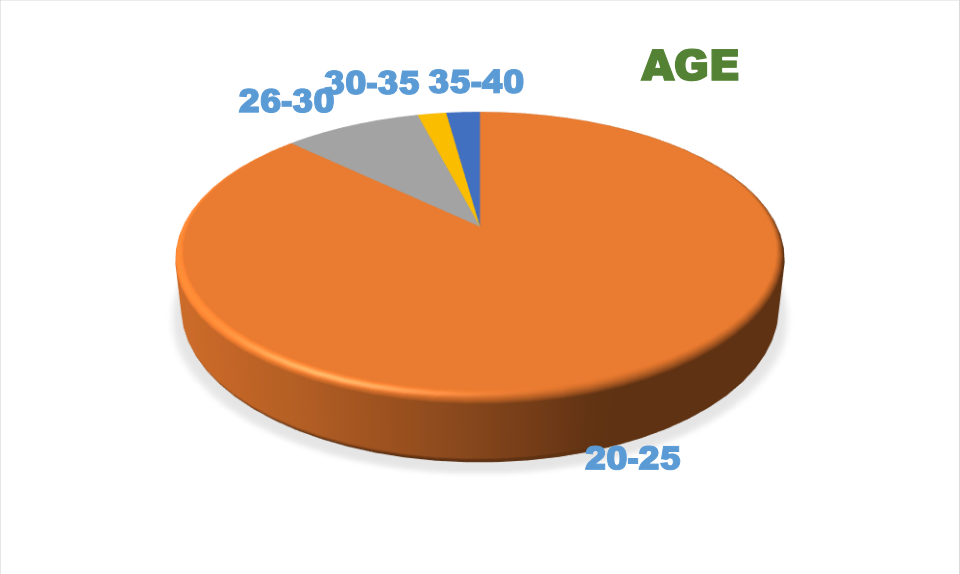


TABLE 4.3

DISTRIBUTION OF THE SAMPLE BASED ON GENDER

S.No.	Gender	Number of students	Percentage
1	Male	29	4.8
2	Female	571	95.2
Total		600	100

The above table reveals the gender wise information of the selected sample. Among 600 students 4.8% of male students and 95.2% of female students were selected for the study. The female dominance is seen here.

FIGURE 4.2

DISTRIBUTION OF THE SAMPLE BASED ON GENDER

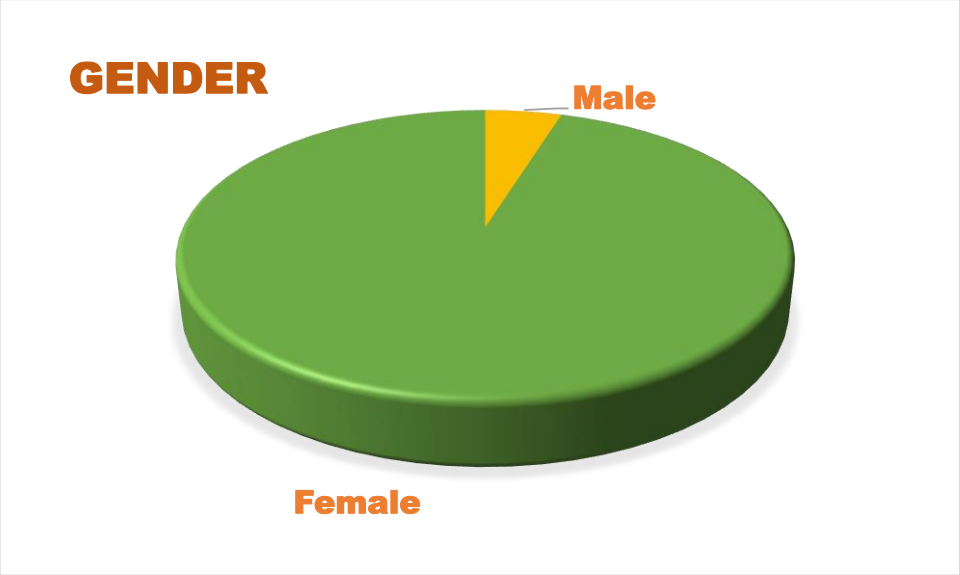


TABLE 4.4

DISTRIBUTION OF THE SAMPLE BASED ON TYPE OF INSTITUTION

S.No.	Type of Institution	Number of students	Percentage
1	Government	202	33.7
2	Aided	162	27
3	Private	236	39.3
Total		600	100

The above table reveals the type of institution wise information of the selected sample. Among 600 students 33.7% students were from Government institutions, 27% students were from Aided institutions and 39.3% students were from private institutions. In this sample the majority of the students are from private institutions.

FIGURE 4.3

DISTRIBUTION OF THE SAMPLE BASED ON TYPE OF INSTITUTION

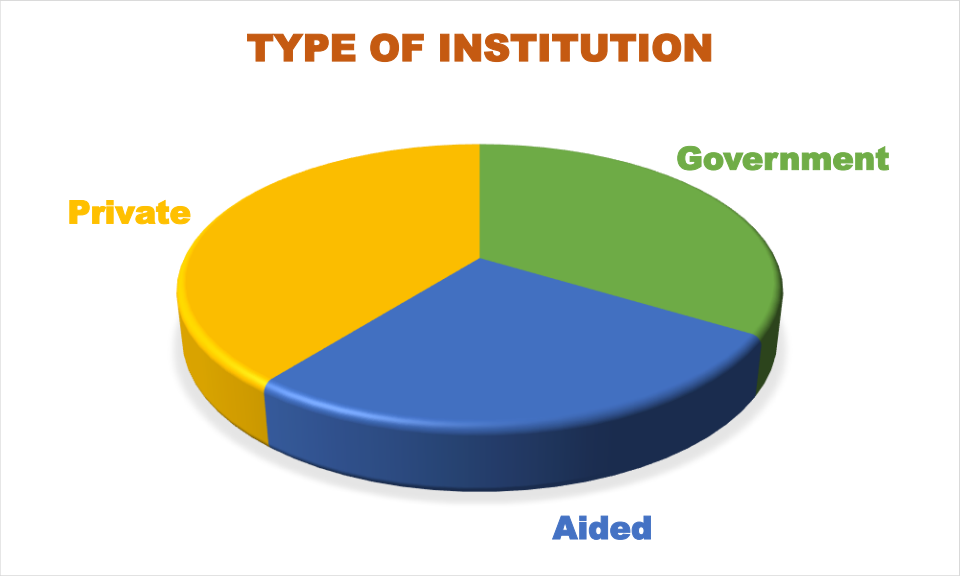


TABLE 4.5

DISTRIBUTION OF THE SAMPLE BASED ON YEAR OF EDUCATION

S.No.	Type of Institution	Number of students	Percentage
1	First	292	48.7
2	Second	308	51.3
Total		600	100

The above table reveals the year in which they study wise information of the selected sample. Among 600 students 48.7% students were from first year and 51.3% students were from second year in the selected sample. The majority of the students were from the second year of their education.

FIGURE 4.4

DISTRIBUTION OF THE SAMPLE BASED ON YEAR OF EDUCATION

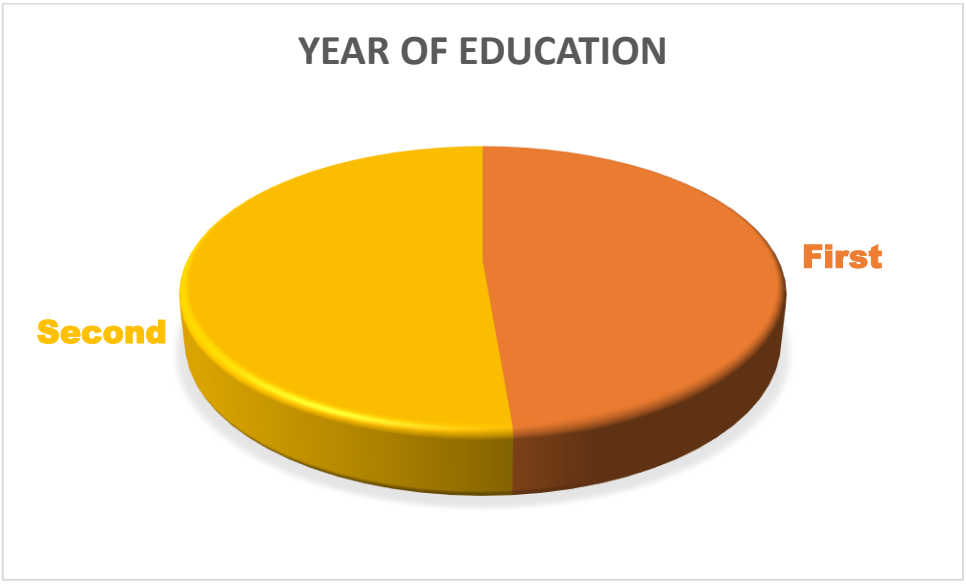


TABLE 4.6

DISTRIBUTION OF THE SAMPLE BASED ON LEVEL OF EDUCATION

S.No.	Level of Education	Number of students	Percentage
1	UG	395	66
2	PG	205	34
Total		600	100

The above table reveals the year in which they study wise information of the selected sample. Among 600 students 66% students were at UG level and 34% students were at PG level in the selected sample. The majority of the students were at UG level in their educational background.

FIGURE 4.5

DISTRIBUTION OF THE SAMPLE BASED ON LEVEL OF EDUCATION

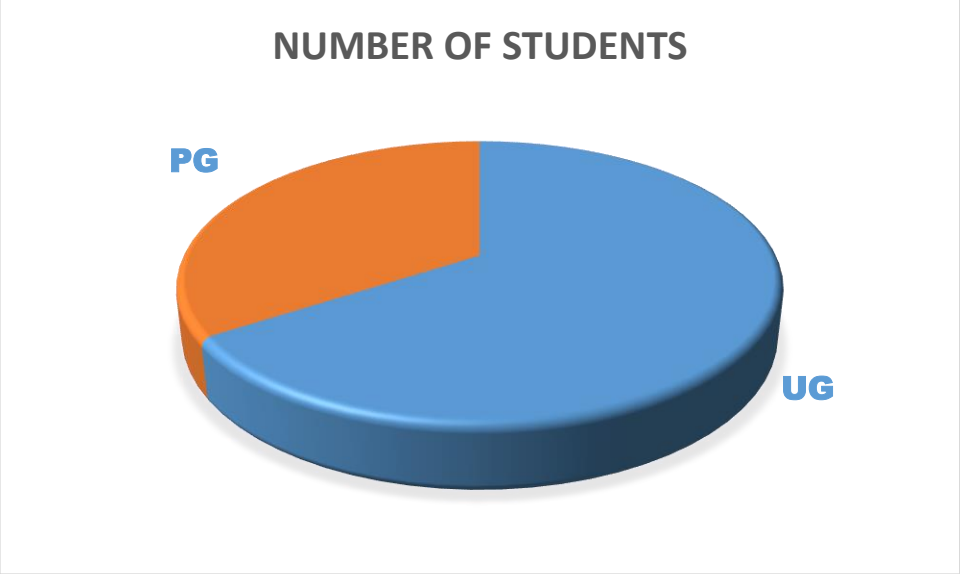


TABLE4.7

DISTRIBUTION OF THE SAMPLE BASED ON SUBJECT

S.No.	Subject	Number of students	Percentage
1	Arts	278	46
2	Science	322	54
Total		600	100

The above table reveals the subject wise information of the selected samples. Among 600 students 46% were from the Arts background and 54% students were from the Science background. The majority of the students were from the Science background.

FIGURE 4.6

DISTRIBUTION OF THE SAMPLE BASED ON SUBJECT

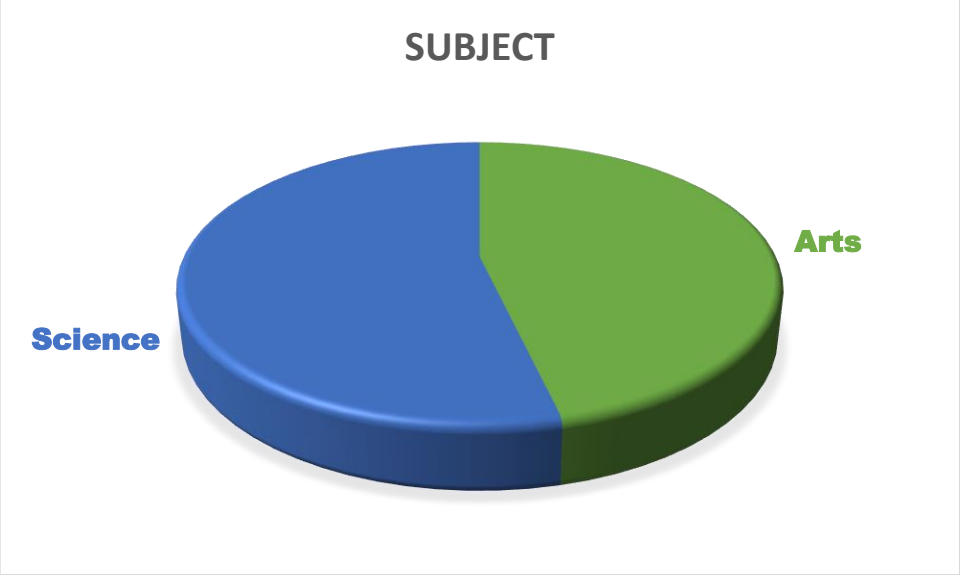


TABLE 4.8

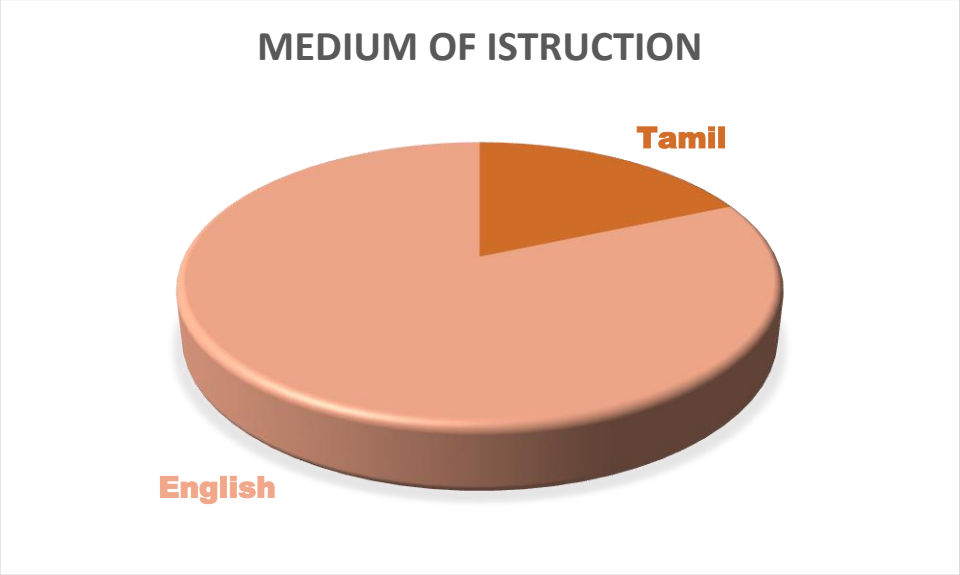
DISTRIBUTION OF THE SAMPLE BASED ON MEDIUM OF INSTRUCTION

S.No.	Medium of Instruction	Number of students	Percentage
1	Tamil	111	18.5
2	English	489	81.5
Total		600	100

The above table reveals the medium of instruction wise information of the selected sample. Among 600 students 18.5% students were from Tamil medium and 81.5% students were from English medium. The majority of the students were from the English medium background.

FIGURE 4.7

DISTRIBUTION OF THE SAMPLE BASED ON MEDIUM OF INSTRUCTION



MOBILE USAGE ACCESS AND EXPERIENCE

TABLE 4.9

DISTRIBUTION OF THE SAMPLE BASED ON YEARS OF SMART PHONE USAGE

S.No.	Years of SP Usage	Number of students	Percentage
1	>1	15	2.5
2	1-3	124	20.7
3	3-5	228	38
4	<5	233	38.8
Total		600	100

The above table reveals the information on the years of smart phone usage experience of the selected sample. Among 600 students 2.5% students have been using smart phone for less than a year, 20.7% students were using between 1 to 3 years, 228 students have been using between 3 to 5 years and 233 students have been using for more than 5 years. The majority of the students have been using smart phone for more than 5 years.

FIGURE 4.8

DISTRIBUTION OF THE SAMPLE BASED ON YEARS OF SMART PHONE USAGE

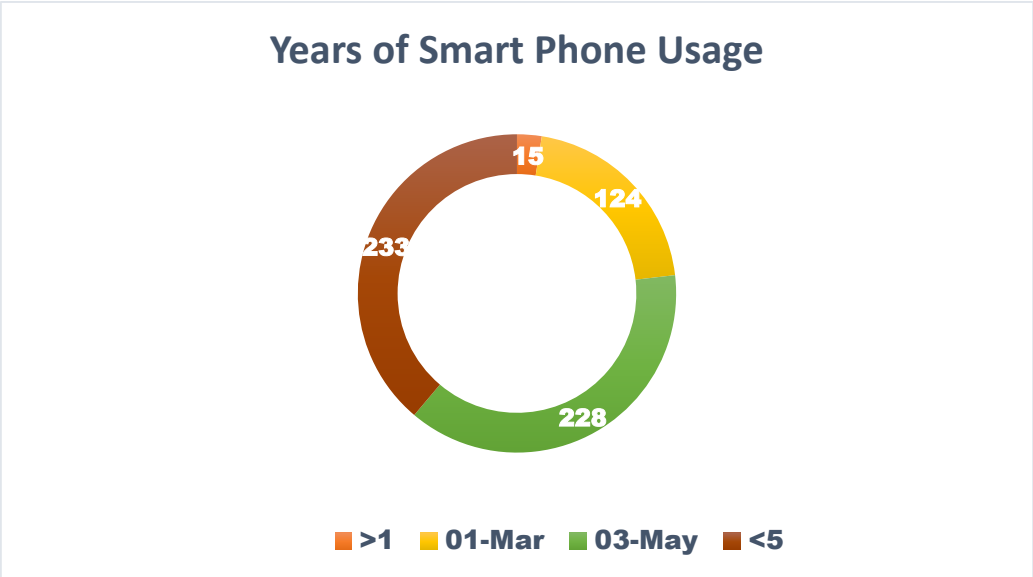


TABLE 4.10

DISTRIBUTION OF THE SAMPLE BASED ON THE TYPE OF LEARNER

S.No.	Type of Learner	Number of students	Percentage
1	Beginner	59	9.8
2	Moderately Active Participant	153	25.5
3	Active Participant	388	64.7
Total		600	100

The above table reveals the information on the type of learner in smart phone usage of the selected sample. Among 600 students 9.8% of students were the beginner in smart phone usage, 25.5% of them were moderately active participant and 64.7% of students were active participant of smart phone users. The majority of the students were the active participants of smart phone usage.

FIGURE 4.9

DISTRIBUTION OF THE SAMPLE BASED ON TYPE OF LEARNER

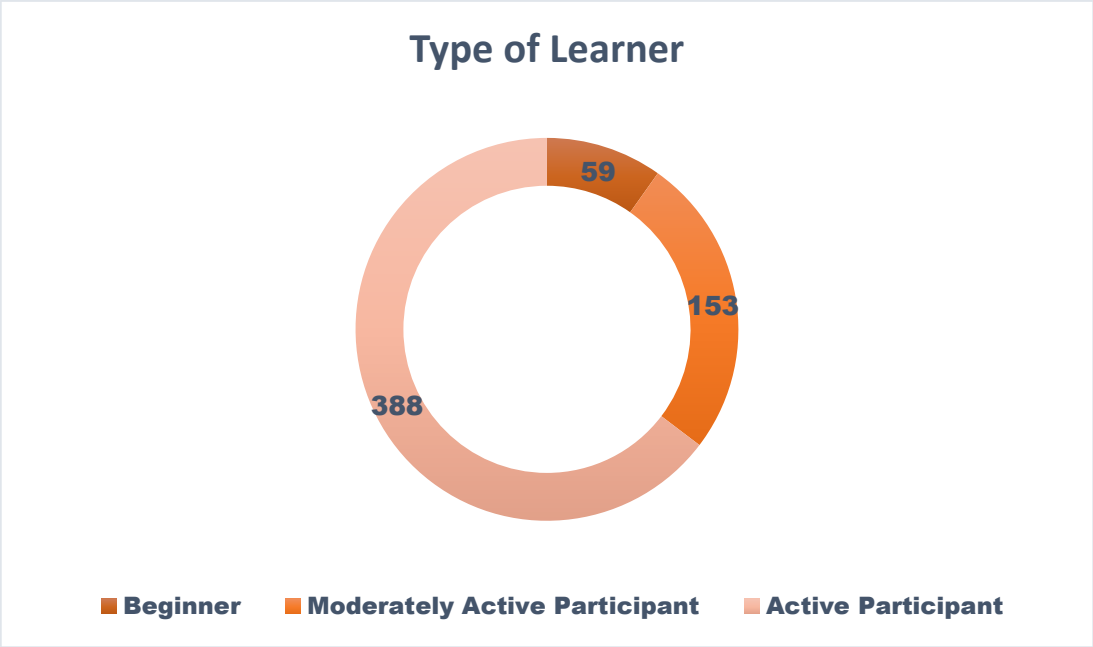


TABLE 4.11

DISTRIBUTION OF THE SAMPLE BASED ON MONTHLY SMART PHONE BILL

S.No.	Monthly Bill	Number of students	Percentage
1	>Rs.300	360	60
2	Rs.300-500	182	30.3
3	Rs.500 -1000	48	8
4	<Rs.1000	10	1.7
Total		600	100

The above table reveals the information on the monthly smart phone bill amount of the selected sample. Among 600 students 60% of students spent less than Rs.300 a month, 30.3% of the students spent Rs.300 – 500, 8% of students spent Rs.500-1000 and 1.7% of students spent above Rs.1000 a month for their smart phone bill. The majority of the students spent less than Rs.300 for their smart phone bill.

FIGURE 4.10

DISTRIBUTION OF THE SAMPLE BASED ON MONTHLY BILL

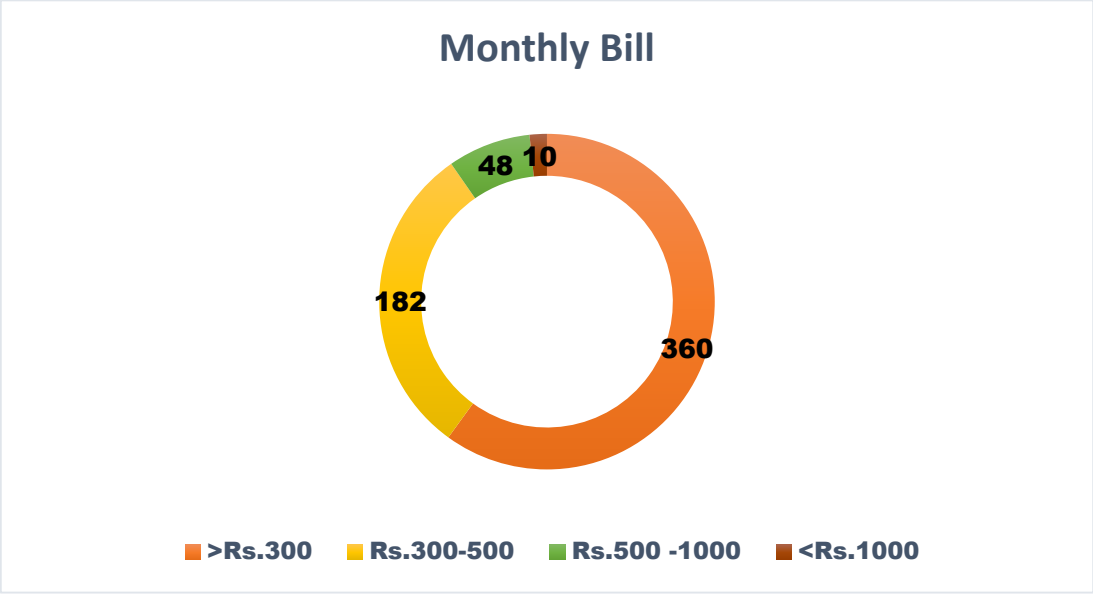


TABLE 4.12

DISTRIBUTION OF THE SAMPLE BASED ON OPERATING SYSTEM

S.No.	Operating System	Number of students	Percentage
1	ios	23	3.8
2	Android	577	96.2
Total		600	100

The above table reveals the information about the operating system used in the smart phone of the selected sample. Among 600 students 3.8% of students had the iOS operating system and 96.2% of students had the android operating system. The majority of the students had the Android operating system in their smart phone.

FIGURE 4.11

DISTRIBUTION OF THE SAMPLE BASED ON OPERATING SYSTEM

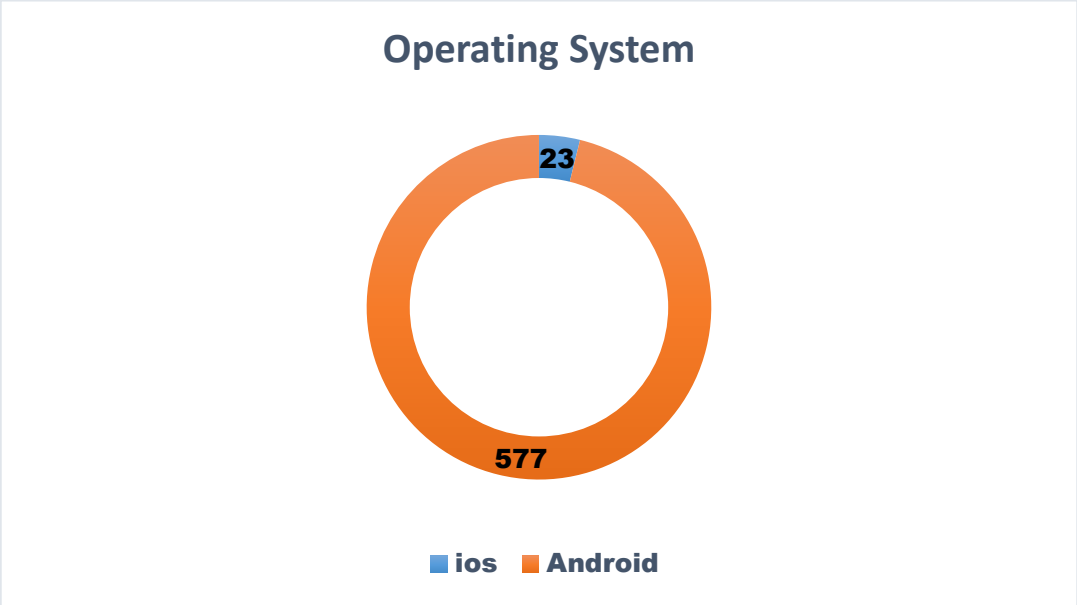


TABLE 4.13

DISTRIBUTION OF THE SAMPLE BASED ON FREQUENCY OF INTERNET USAGE

S.No.	Internet Usage	Number of students	Percentage
1	>1 hour	73	12.2
2	1 – 2 hours	191	31.8
3	2-3 hours	151	25.2
4	<3 hours	185	30.8
Total		600	100

The above table reveals the information about the frequency of internet usage on daily basis of the selected sample. Among 600 students 12.2% of students used internet less than an hour on daily basis, 31.8% of students used between 1 to 2 hours a day, 25.2% of students used between 2 to 3 hours a day and 30.8% of students used internet more than 3 hours a day. The majority of the students use internet for 1-2 hours a day with the minimal difference of 1% with the students whore use internet for more than 3 hours a day.

FIGURE 4.12

DISTRIBUTION OF THE SAMPLE BASED ON OPERATING SYSTEM

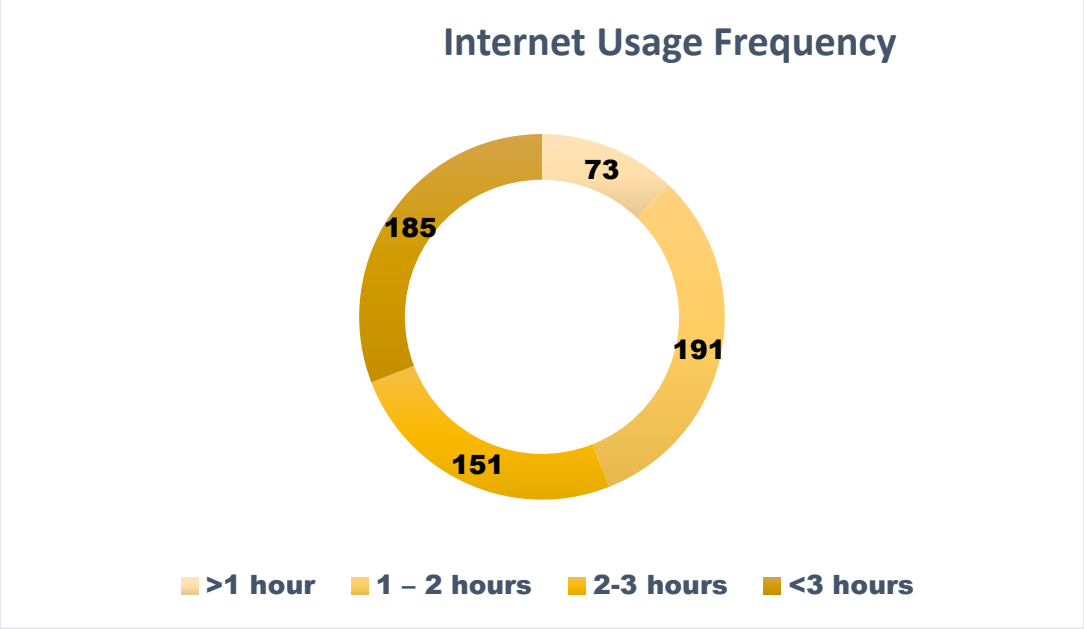


TABLE 4.14

DISTRIBUTION OF THE SAMPLE BASED ON NUMBER OF SMART PHONES OWNED

S.No.	No. of Phones	Number of students	Percentage
1	1	477	79.5
2	2	84	14
3	3	32	5.3
4	More than 3	7	1.2
Total		600	100

The above table reveals the information about the number of smart phones owned by the selected sample. Among 600 students 79.5% of students owned only 1 smart phone, 14% of them owned 2 smart phones, 5.3% of them owned 3 smart phones and 1.2% of them have owned more than 3 smart phones till the date of the survey. The majority of the students have owned only one smart phone.

FIGURE 4.13

DISTRIBUTION OF THE SAMPLE BASED ON NUMBER OF SMART PHONES OWNED

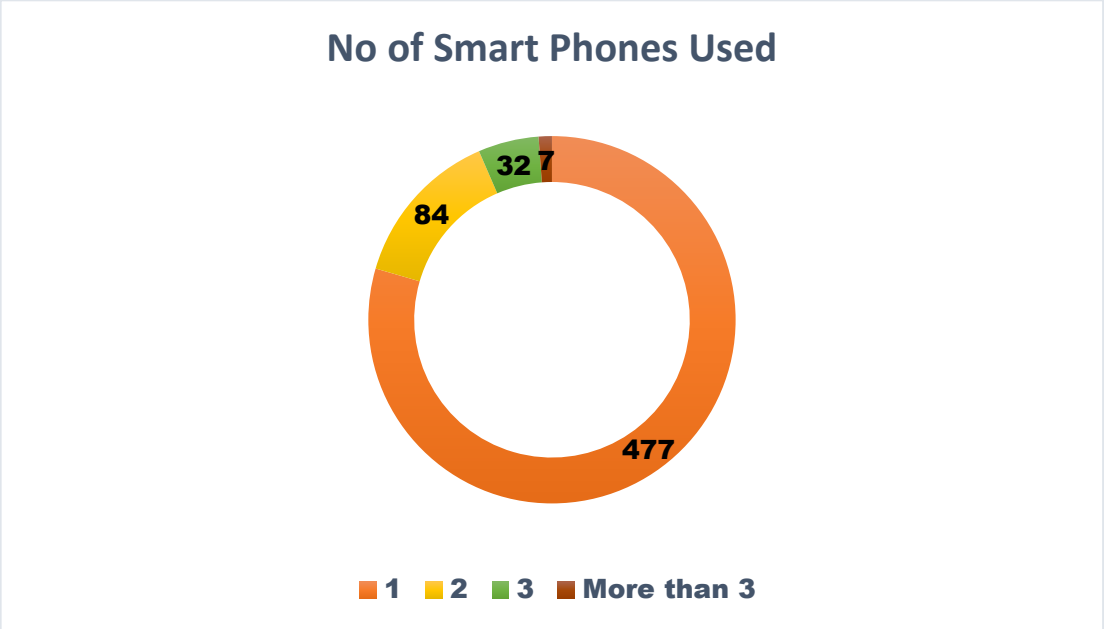


TABLE 4.15

DISTRIBUTION OF THE SAMPLE BASED ON NUMBER OF SMART PHONES CHANGED DURING LAST 2 YEARS

S.No.	No. of SP Changed	Number of students	Percentage
1	1	484	80.7
2	2	91	15.2
3	3	17	2.8
4	More than 3	8	1.3
Total		600	100

The above table reveals the information about the number of smart phones owned by the selected sample. Among 600 students 80.7% of students has changed only 1 phone during the last 2 years, 15.2% of students changed 2 phones, 2.8% of students changed 3 phones and 1.3% of students changed more than 3 smart phones during the last 2 years. The majority of the students have changed only one smart phone.

FIGURE 4.14

DISTRIBUTION OF THE SAMPLE BASED ON NUMBER OF SMART PHONES CHANGED DURING LAST 2 YEARS

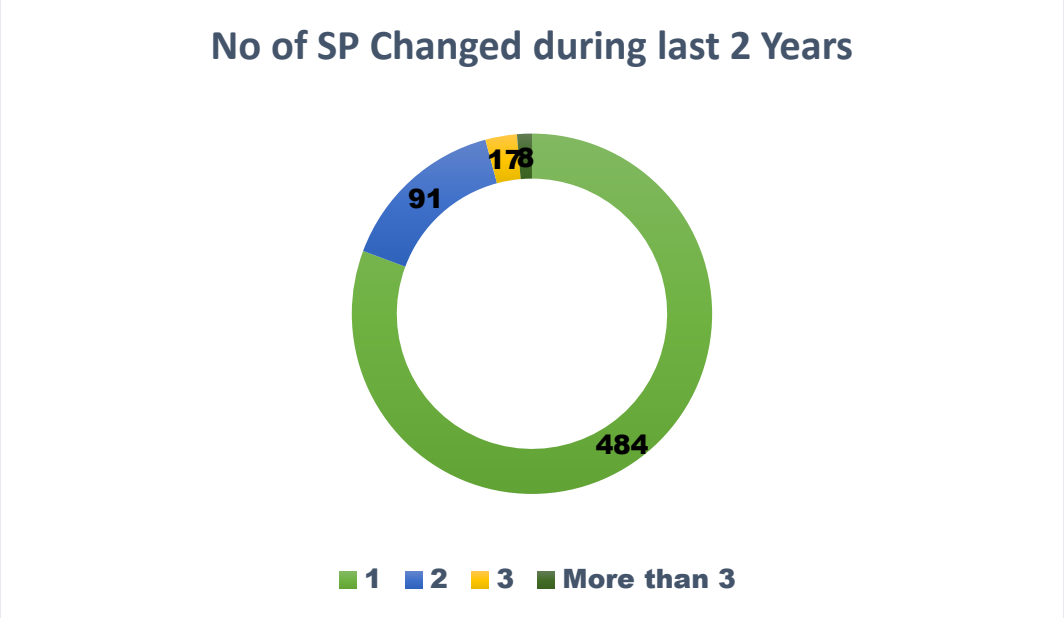


TABLE 4.16

DISTRIBUTION OF THE SAMPLE BASED ON NUMBER OF SIM CARDS

S.No.	Sim Cards	Number of students	Percentage
1	1	441	73.5
2	2	157	26.2
3	More than 2	2	0.3
Total		600	100

The above table reveals the information about the number of sim cards used by the selected sample. Among 600 students 73.5% of students used only 1 sim card, 26.2% of students used 2 sim cards and 0.3% of students used more than 2 sim cards at the time of the survey. The majority of the students use only one sim card in their smart phone.

FIGURE 4.15

DISTRIBUTION OF THE SAMPLE BASED ON NUMBER OF SIM CARDS

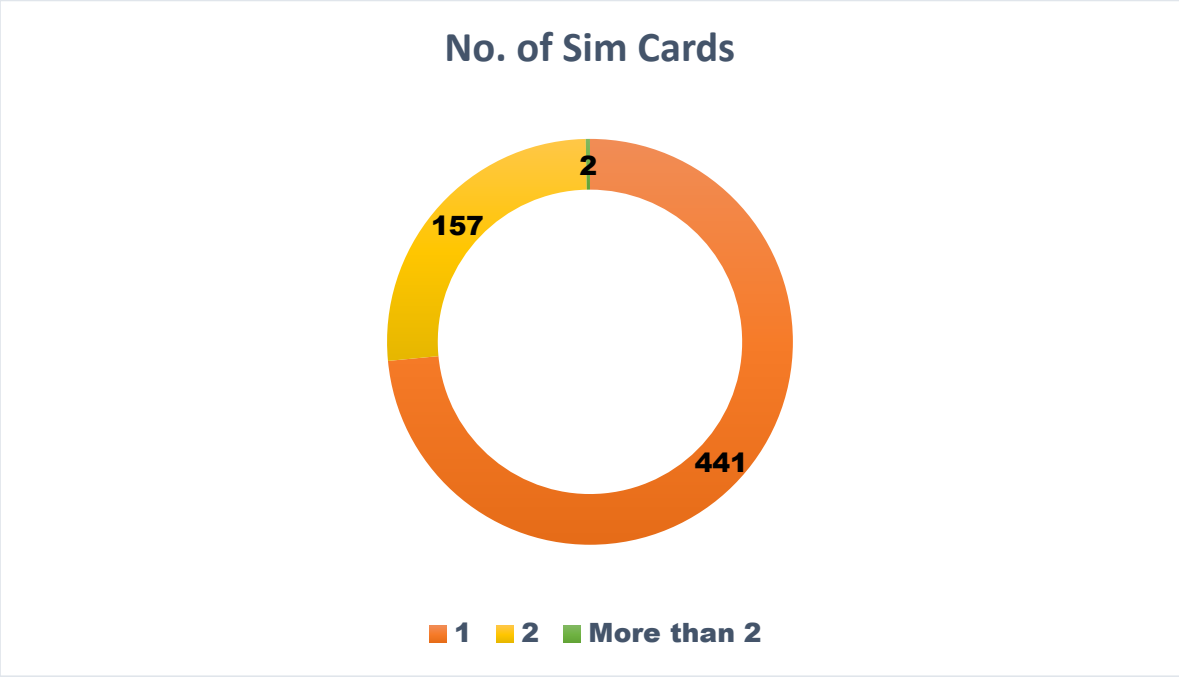


TABLE 4.17

DISTRIBUTION OF THE SAMPLE BASED ON MOBILE NETWORK USED

S.No.	Mobile Network	Number of students	Percentage
1	Airtel	258	43
2	Vodafone	80	13.3
3	Jio	262	43.7
Total		600	100

The above table reveals the information about the mobile networks used by the selected sample. Among 600 students 43% of students use Airtel, 13.3% of students use Vodafone and 43.7% of students use Jio as their mobile network. The majority of students use Jio for their mobile network with a 0.3 difference from the Airtel.

FIGURE 4.16

DISTRIBUTION OF THE SAMPLE BASED ON MOBILE NETWORK

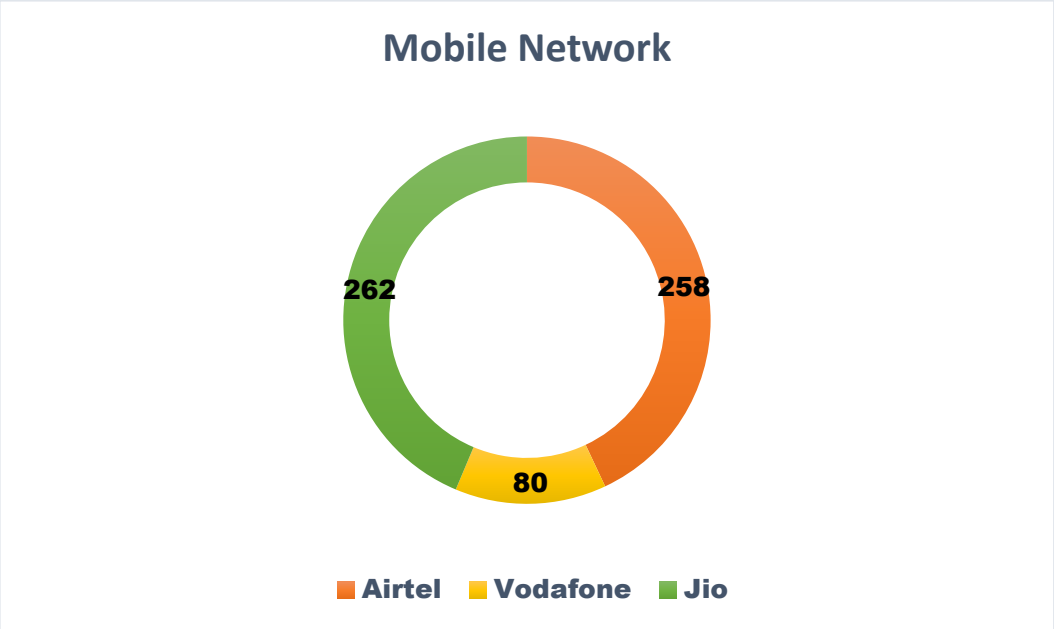


TABLE 4.18

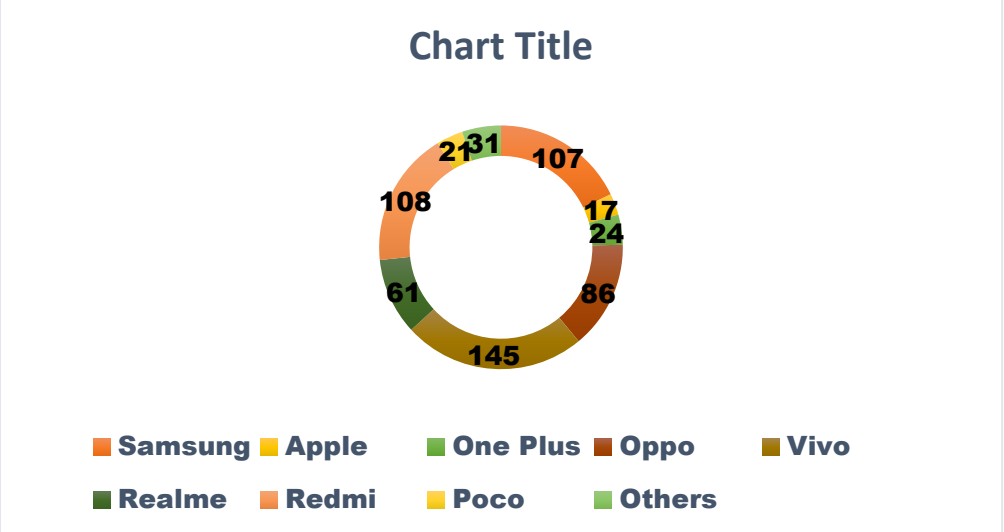
DISTRIBUTION OF THE SAMPLE BASED ON SMART PHONE BRAND OWNED

S.No.	SP Brand	Number of students	Percentage
1	Samsung	107	17.8
2	Apple	17	2.8
3	One Plus	24	4
4	Oppo	86	14.3
5	Vivo	145	24.2
6	Realme	61	10.2
7	Redmi	108	18
8	Poco	21	3.5
9	Others	31	5.2
Total		600	100

The above table reveals the information about the number of smart phones owned by the selected sample. Among 600 students 17.8% of them owned Samsung, 2.8% of them owned Apple 4% of them owned One Plus, 14.3% of them owned Oppo, 24.2% of them owned Vivo, 10.2% of them owned Realme, 18% of them owned Redmi, 3.5% of them owned Poco and 5.2% of the students owned smart phones of various other brands. The majority of the students owned Realme brand of Smart phones.

FIGURE 4.17

DISTRIBUTION OF THE SAMPLE BASED ON NUMBER OF SMART PHONE BRAND OWNED



SECTION II

DIFFERENTIAL ANALYSIS

TABLE 4.19

ANALYSIS OF SMART PHONE USAGE OF STUDENT TEACHERS BASED ON THE AGE

Age	Number of students	Mean	Standard Deviation	'f' value
20-25	522	107.45	26.57	.001
26-30	53	100.50	27.32	
31-35	12	88.75	28.37	
36-40	13	84.76	24.06	

Significant at 0.05 level

The statistical analysis reveals that the calculated 'f' value .001 is significant at 0.05 level. Hence it indicates that there is significant difference between the smart phone Usage and Age.

Hence the hypothesis stated that, **"There is no significant difference between usage of smart phone in teaching learning, assessment and Age of the student teacher."** is rejected.

FIGURE 4.18

ANALYSIS OF SMART PHONE USAGE OF STUDENT TEACHERS BASED ON THE AGE

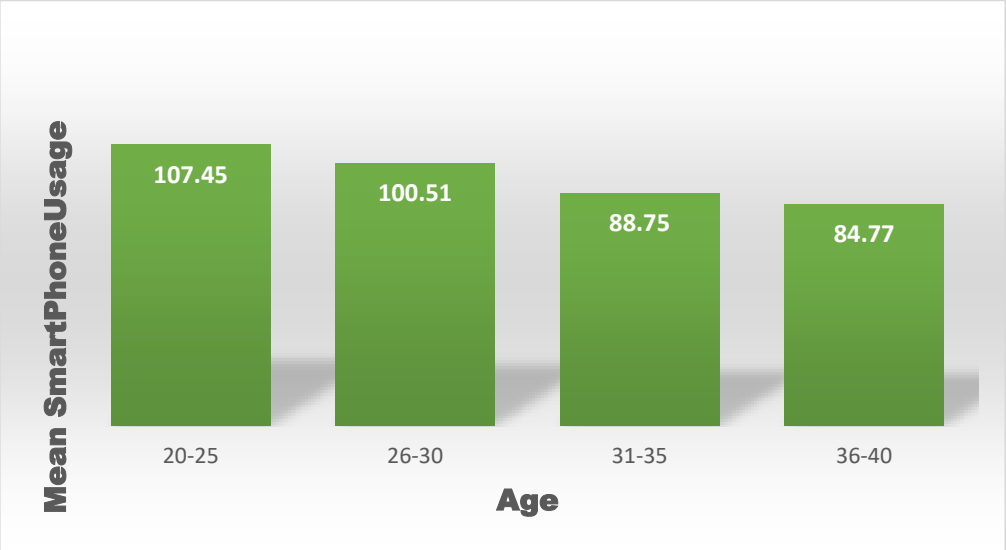


TABLE 4.20

ANALYSIS OF SMART PHONE USAGE OF STUDENT TEACHERS BASED ON THE GENDERS

Gender	Number of students	Mean	Standard Deviation	't' value
Male	29	96.03	28.00	.042
Female	571	106.47	26.89	

Significant at 0.05 level

The statistical analysis reveals that the calculated't' value .042 is significant at 0.05 level. Hence it indicates that there is significant difference between the smart phone Usage and Gender.

Hence the hypothesis stated that, **"There is no significant difference between usage of smart phone in teaching learning, assessment and gender of the student teacher."** is rejected.

FIGURE 4.19

ANALYSIS OF SMART PHONE USAGE OF STUDENT TEACHERS BASED ON THE GENDERS

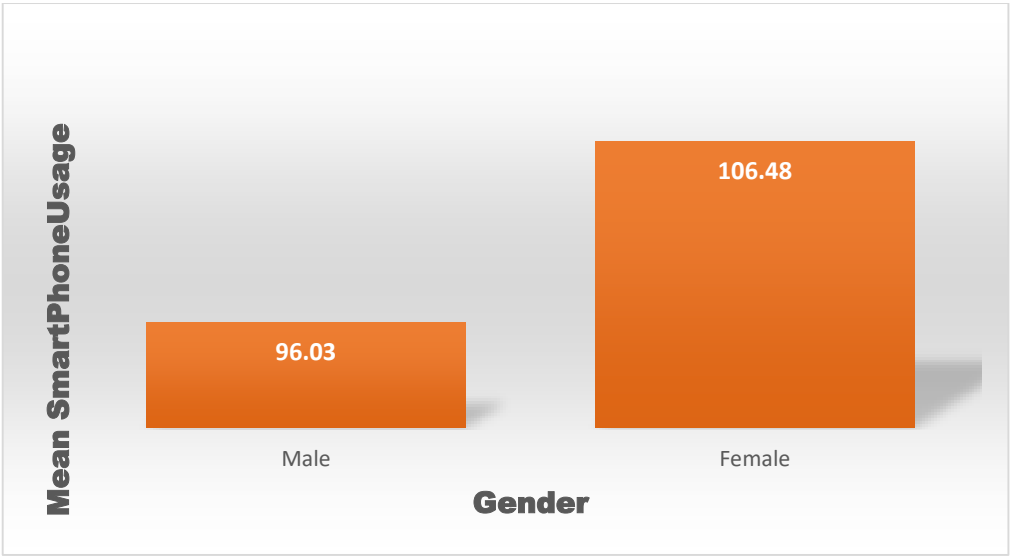


TABLE 4.21

ANALYSIS OF SMART PHONE USAGE OF STUDENT TEACHERS BASED ON THE TYPE OF INSTITUTION

Type Of Institution	Number of students	Mean	Standard Deviation	'f' value
Government	202	109.73	27.28	.002
Private	236	101.17	26.89	
Aided	162	108.27	25.97	

Significant at 0.05 level

The statistical analysis reveals that the calculated 'f' value .002 is significant at 0.05 level. Hence it indicates that there is significant difference between the smart phone Usage and Type of Institution.

Hence the hypothesis stated that, **"There is no significant difference between usage of smart phone in teaching learning, assessment and Type of Institution of the student teacher"** is rejected.

FIGURE 4.20

ANALYSIS OF SMART PHONE USAGE OF STUDENT TEACHERS BASED ON THE TYPE OF INSTITUTION

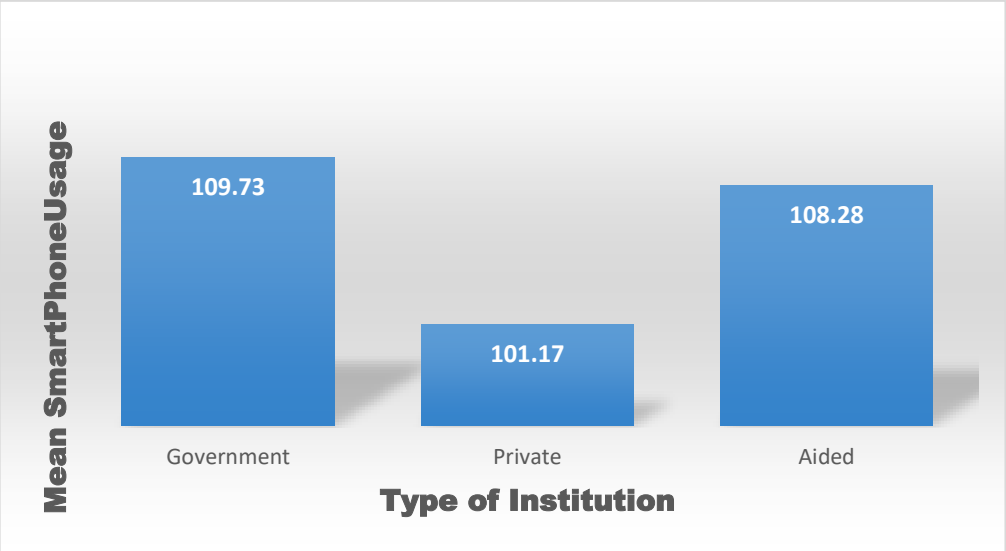


TABLE 4.22

ANALYSIS OF SMART PHONE USAGE OF STUDENT TEACHERS BASED ON THE LEVEL OF EDUCATION

Level Of Education	Number of students	Mean	Standard Deviation	't' value
UG	395	106.85	26.55	.269
PG	205	104.27	27.89	

The statistical analysis reveals that the calculated't' value .269 is not significant at 0.05 level. Hence it indicates that there is no significant difference between the smart phone Usage and Level of Education.

Hence the hypothesis stated that, **"There is no significant difference between usage of smart phone in teaching learning, assessment and Level of education of the student teacher."** is accepted.

FIGURE 4.21

ANALYSIS OF SMART PHONE USAGE OF STUDENT TEACHERS BASED ON THE LEVEL OF EDUCATION

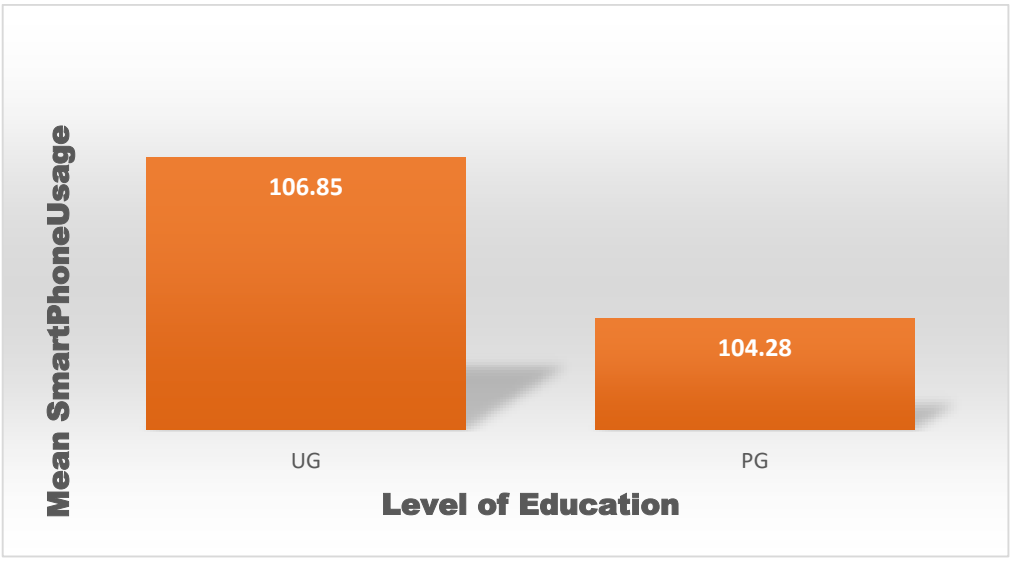


TABLE 4.23

ANALYSIS OF SMART PHONE USAGE OF STUDENT TEACHERS BASED ON THE YEAR OF EDUCATION

Year Of Education	Number of students	Mean	Standard Deviation	't' value
First Year	292	103.55	27.08	.032
Second Year	308	108.26	26.79	

Significant at 0.05 level

The statistical analysis reveals that the calculated 't' value .032 is significant at 0.05 level. Hence it indicates that there is significant difference between the smart phone Usage and Year of Education.

Hence the hypothesis stated that, **"There is no significant difference between usage of smart phone in teaching learning, assessment and Year of Education of the student teacher."** is rejected.

FIGURE 4.22

ANALYSIS OF SMART PHONE USAGE OF STUDENT TEACHERS BASED ON THE YEAR OF EDUCATION

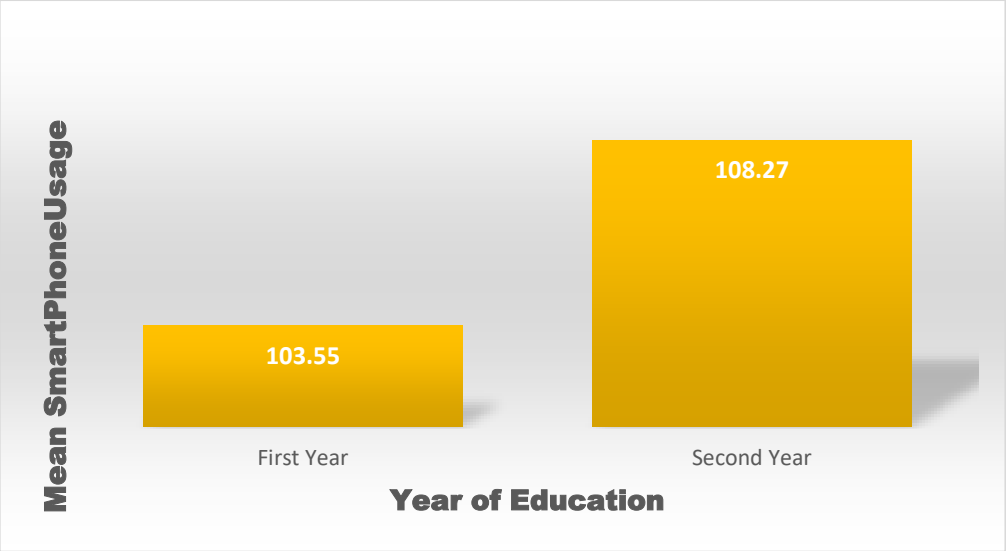


TABLE 4.24

ANALYSIS OF SMART PHONE USAGE OF STUDENT TEACHERS BASED ON THE SUBJECT MAJOR

Subject Major	Number of students	Mean	Standard Deviation	't' value
Arts	278	103.44	27.29	.033
Science	322	108.15	26.63	

Significant at 0.05 level

The statistical analysis reveals that the calculated 't' value .033 is significant at 0.05 level. Hence it indicates that there is significant difference between the smart phone Usage and Subject Major.

Hence the hypothesis stated that, **"There is no significant difference between usage of smart phone in teaching learning, assessment and Subject Major of the student teacher."** is rejected.

FIGURE 4.23

ANALYSIS OF SMART PHONE USAGE OF STUDENT TEACHERS BASED ON THE SUBJECT MAJOR

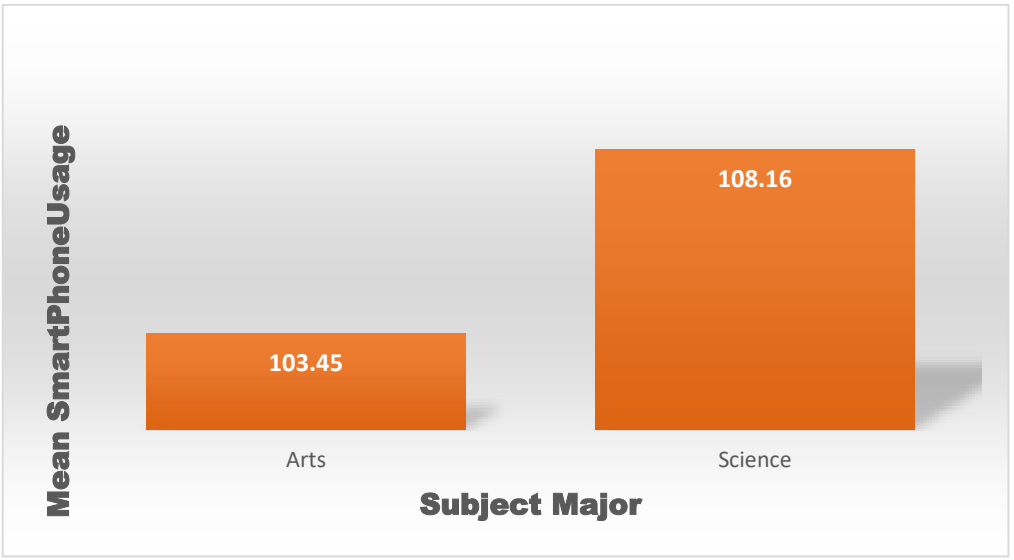


TABLE 4.25

ANALYSIS OF SMART PHONE USAGE OF STUDENT TEACHERS BASED ON THE MEDIUM OF INSTRUCTION

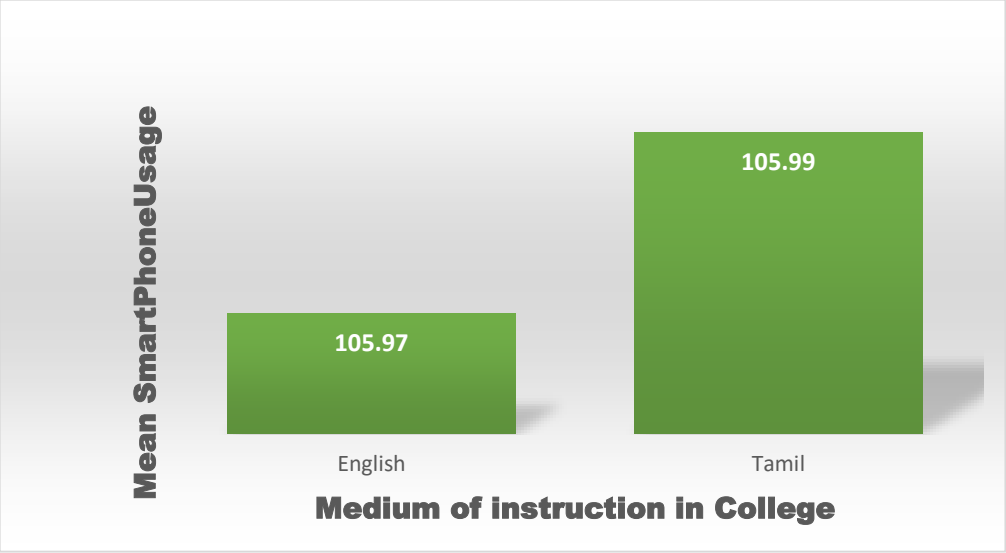
Medium Of Instruction	Number of students	Mean	Standard Deviation	't' value
Tamil	111	105.99	26.65	.994
English	489	105.96	27.13	

The statistical analysis reveals that the calculated 't' value .994 is not significant at 0.05 level. Hence it indicates that there is no significant difference between the smart phone Usage and Subject and Medium of Instruction.

Hence the hypothesis stated that, **"There is no significant difference between usage of smart phone in teaching learning, assessment and Medium of instruction at college of the student teacher"** is accepted.

FIGURE 4.24

ANALYSIS OF SMART PHONE USAGE OF STUDENT TEACHERS BASED ON THE MEDIUM OF INSTRUCTION



Correlation

TABLE 4.26

DESCRIPTIVE STATISTICS OF SMART PHONE USAGE OF STUDENT TEACHERS BASED ON SMART PHONE USAGE ACCESS AND EXPERIENCE

Variables	Mean	Std. Deviation	N
Smart Phone Usage	105.9733	27.02116	600
Access and Experience	21.0750	3.10571	600

TABLE 4.27

CORRELATION OF SMART PHONE USAGE OF STUDENT TEACHERS BASED ON SMART PHONE USAGE ACCESS AND EXPERIENCE

		Smart Phone Usage	Access and Experience
Smart Phone Usage	Pearson Correlation	1	.024
	Sig. (2-tailed)		.555
	N	600	600
Access and Experience	Pearson Correlation	.024	1
	Sig. (2-tailed)	.555	
	N	600	600

The statistical analysis reveals that the correlation is not significant. Hence it indicates that there is no significant difference between the usage of smart phone in teaching learning, assessment and Smart phone usage access and experience.

Hence the hypothesis stated that, **"There is no significant difference between usage of smart phone in teaching learning, assessment and Smart phone usage access and experience."** is accepted.

TABLE 4.28

CORRELATION OF SMART PHONE USAGE OF STUDENT TEACHERS

		Usage Pattern	Teaching Learning	Extra Course and Examination	Preparation of Teaching Content	Connectivity and Data Storage
Usage Pattern	Pearson Correlation	1	.528**	.424**	.422**	.449**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	600	600	600	600	600
Teaching Learning	Pearson Correlation	.528**	1	.661**	.616**	.603**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	600	600	600	600	600
Extra Course and Examination	Pearson Correlation	.424**	.661**	1	.676**	.589**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	600	600	600	600	600
Preparation of Teaching Content	Pearson Correlation	.422**	.616**	.676**	1	.685**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	600	600	600	600	600
Connectivity and Data Storage	Pearson Correlation	.449**	.603**	.589**	.685**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	600	600	600	600	600

**Significant at 0.01 level

The statistical analysis reveals that the correlation is significant at 0.01 level. Hence it indicates that there is significant relationship between the General usage pattern, Teaching and Learning, Preparation of Teaching Content, Extra courses and Examination and connectivity and Data Storage.

Hence the hypothesis stated that, **"There is no significant difference between the General usage pattern, Teaching and Learning, Preparation of Teaching Content, Extra courses and Examination and connectivity and Data Storage."** is rejected.

4.7Conclusion

The interpretation chapter provides valuable insights into the complex relationship between smartphone usage and educational practices, offering implications for both research and practice in the field of education.

The analysis helped the investigator to arrive at the findings and offer the recommendation for improvement in the field of educational technology and suggestion for further research, which are presented in the next chapter.

SUMMARY AND CONCLUSION

CHAPTER V

SUMMARY AND CONCLUSION

5.1 Introduction

In this final chapter, we bring together the threads of our research journey, consolidating our findings, insights, and contributions. The summary and conclusion chapter serves as the culmination of our investigative efforts, offering a comprehensive overview of the study's objectives, methodologies, results, and their implications. As we delve into the summary, we revisit the key points unearthed throughout our exploration, providing readers with a succinct synthesis of the main findings. Additionally, the conclusion section offers reflections on the significance of our research within the broader academic context, shedding light on its potential impacts, limitations, and avenues for future inquiry. Through this chapter, we aim to encapsulate the essence of our research endeavour and its implications for theory, practice, and further research pursuits.

5.2 Major Findings of the Study

The statistical analysis of the scores revealed the following findings:

5.2.1 Gender and Usage of Smart phone

Based on the statistical analysis, the calculated 't' value of 0.042 is found to be significant at the 0.05 level. This indicates that there is a statistically significant difference in smartphone usage between genders. Here are the findings:

- The analysis suggests that there are meaningful variations in smartphone usage patterns between different genders.
- Specifically, the 't' value being significant at the 0.05 level implies that the observed differences in mean smartphone usage between genders are unlikely to have occurred by random chance alone.
- Gender emerges as a significant factor influencing smartphone usage.
- The mean smartphone usage differs significantly between genders, indicating that males and females may have distinct patterns of smartphone usage.

5.2.2 Age and Usage of Smart phone

Based on the statistical analysis, the calculated 'f' value of 0.001 is found to be significant at the 0.05 level. This implies that there is a statistically significant difference in smartphone usage among students of different age groups. Here are the findings:

- The analysis indicates that there are meaningful variations in smartphone usage patterns among students belonging to different age ranges.
- Specifically, the 'f' value being significant at the 0.05 level suggests that the observed differences in mean smartphone usage across age groups are unlikely to have occurred by random chance alone.
- Age appears to be a significant factor influencing smartphone usage among students.
- The mean smartphone usage varies noticeably across age groups, with younger students generally exhibiting higher smartphone usage compared to older students.

5.2.3 Type of Institution and Usage of Smart phone

Based on the statistical analysis, the calculated 'f' value of 0.002 is found to be significant at the 0.05 level. This suggests that there is a statistically significant difference in smartphone usage based on the type of institution. Here are the findings:

- The analysis indicates that there are meaningful variations in smartphone usage patterns based on the type of institution.
- Specifically, the 'f' value being significant at the 0.05 level implies that the observed differences in mean smartphone usage across different types of institutions are unlikely to have occurred by random chance alone.
- The type of institution (e.g., public vs. private, university vs. college) appears to be a significant factor influencing smartphone usage.
- The mean smartphone usage differs significantly between students attending different types of institutions, suggesting that institutional characteristics may influence smartphone usage behaviours.

5.2.4 Level of Education and Usage of Smart phone

Based on the statistical analysis, the calculated 't' value of 0.269 is not significant at the 0.05 level. This suggests that there is no statistically significant difference in smartphone usage based on the level of education. Here are the findings:

- The analysis indicates that there are no meaningful variations in smartphone usage patterns based on the level of education.
- Specifically, the't' value being not significant at the 0.05 level implies that any observed differences in mean smartphone usage across different levels of education could likely be due to random chance.
- The level of education (e.g., high school, undergraduate, graduate) does not appear to be a significant factor influencing smartphone usage among students.
- The mean smartphone usage does not differ significantly between students at different levels of education, suggesting that educational attainment may not have a strong influence on smartphone usage behaviours.

5.2.5 Year of Education and Usage of Smart phone

Based on the statistical analysis, the calculated't' value of 0.032 is significant at the 0.05 level. This indicates that there is a statistically significant difference in smartphone usage based on the year of education. Here are the findings:

- The analysis suggests that there are meaningful variations in smartphone usage patterns based on the year of education.
- Specifically, the 't' value being significant at the 0.05 level implies that the observed differences in mean smartphone usage across different years of education are unlikely to have occurred by random chance alone.
- The year of education (e.g., freshman, sophomore, junior, senior) appears to be a significant factor influencing smartphone usage among students.
- The mean smartphone usage differs significantly between students in different years of education, indicating that progression through educational stages may impact smartphone usage behaviours.

5.2.6 Findings based on smart phone usage Access and Experience

- The mean score of usage of smart phone in teaching learning, assessment of students based on the years of smart phone usage is 104.53 for students who use smart phone less than 1 year, 105.57 for students who use between 1 to 3 years, 107.02 for students who use between 3 to 5 years and 105.25 for students who use more than 5 years.

  The calculated 'f' value is .902 is not significant at 0.05 level. Hence there is no significant difference between the usage of smart phone in teaching learning assessment and years of smart phone usage.

- The mean score of usage of smart phone in teaching learning, assessment of students based on the type of smart phone learner is 111.05 for the beginner, 96.11 for moderately active participant and 105.46 for active participant.

  The calculated 'f' value is .001 is significant at 0.05 level. Hence there is a significant difference between the usage of smart phone in teaching learning assessment and type of smart phone learner.

- The mean score of usage of smart phone in teaching learning, assessment of students based on the monthly smart phone bill is 105.54 for students who spent less than Rs.300, 107.81 for students who spent Rs.300-500, 100.14 for students who spent Rs.500-1000 and 115.70 for students who spent more than Rs.1000.

  The calculated 'f' value is .215 is not significant at 0.05 level. Hence there is no significant difference between the usage of smart phone in teaching learning assessment and monthly smart phone bill.

- The mean score of usage of smart phone in teaching learning, assessment of students based on the type of Operating System is 106.52 for Android users and 92.13 for iOS users.

  The calculated 't' value is .012 is significant at 0.05 level. Hence there is a significant difference between the usage of smart phone in teaching learning assessment and Operating System of the smart phone.

- The mean score of usage of smart phone in teaching learning, assessment of students based on the frequency of internet usage is 103.60 for students who use internet less than 1hr a day, 103.03 for students who use between 1 to 2hr a day, 103.67 for students who use between 2-3hr a day and 106.92 for students who use more than 3hr a day.

  The calculated 'f' value is .117 is not significant at 0.05 level. Hence there is no significant difference between the usage of smart phone in teaching learning assessment and frequency of using internet.

- The mean score of usage of smart phone in teaching learning, assessment of students based on the no of smart phones earned is 107.37 for students who owned single smart phone, 101.65 for students who owned 2, 96.71 for students who owned 3 and 103.28 for students who owned more than 3 smart phones.

  The calculated 'f' value is .063 is not significant at 0.05 level. Hence there is no significant difference between the usage of smart phone in teaching learning assessment and no of smart phones owned.

- The mean score of usage of smart phone in teaching learning, assessment of students based on the no of sim cards used is 106.21 for students who use single sim card, 105.58 for students who use 2 and 82.50 for students who use more than 3.

  The calculated 'f' value is .455 is not significant at 0.05 level. Hence there is no significant difference between the usage of smart phone in teaching learning assessment and no of sim cards used.

- The mean score of usage of smart phone in teaching learning, assessment of students based on the mobile network used is 106.62 for Airtel users, 106.93 for Jio users and 100.72 for Vodafone users.

  The calculated 'f' value is .174 is not significant at 0.05 level. Hence there is no significant difference between the usage of smart phone in teaching learning assessment and mobile network used.
- The mean score of usage of smart phone in teaching learning, assessment of students based on the brand of mobile owned is 100.70 for Samsung users, 90.94 for Apple users, 101.04 for 101.04 Oneplus users, 104.12 for

Oppo users, 111.60 for Vivo users, 111.24 for Vivo users, 105.56 for Redmi users, 102.76 for Poco users, 108.22 for other brand mobile users.

The calculated ‘f’ value is .011 is significant at 0.05 level. Hence there is a significant difference between the usage of smart phone in teaching learning assessment and brand of mobile owned.

5.3 Verification of Hypothesis

Hypothesis verification is a fundamental aspect of scientific inquiry, where researchers test theoretical propositions against empirical evidence through systematic research methodologies. This process embodies the principles of empiricism and falsifiability, essential for advancing knowledge and theory development. Hypothesis verification serves to assess theoretical constructs' validity, practical implications, and real-world applicability while fostering critical thinking and scientific integrity within the research community. This chapter outlines the methodology employed for verifying hypotheses in our study, including research design, data collection, analytical techniques, and criteria for evaluating outcomes.

Hypothesis 1: There is no significant difference between usage of smart phone in teaching learning, assessment and gender of the student teacher.

The mean score of usage of smart phone in teaching learning, assessment of male student is 96.03 and female student is 106.47. The calculated‘t’ value is .042 is significant at 0.05 level. Thus the hypothesis is rejected.

Hypothesis 2: There is no significant difference between usage of smart phone in teaching learning, assessment and Age of the student teacher.

The mean score of usage of smart phone in teaching learning, assessment of students under age group 20-25 is 107.45, under age group 26-30 is 100.50, under age group 31-35 is 88.77 and under age group 36-40 is 84.76. The calculated ‘f’ value is .001 is significant at 0.05 level. Thus the hypothesis is rejected.

Hypothesis 3: There is no significant difference between usage of smart phone in teaching learning, assessment and Level of education of the student teacher.

The mean score of usage of smart phone in teaching learning, assessment of UG students is 106.85 and PG students is 104.27. The calculated‘t’ value is .269 is not significant at 0.05 level. Thus the hypothesis is accepted.

Hypothesis 4: There is no significant difference between usage of smart phone in teaching learning, assessment and Year of Education of the student teacher.

The mean score of usage of smart phone in teaching learning, assessment of First Year students is 103.55 and second year students is 108.26. The calculated ‘t’ value is .032 is significant at 0.05 level. Thus the hypothesis is rejected.

Hypothesis 5: There is no significant difference between usage of smart phone in teaching learning, assessment and Subject Major of the student teacher.

The mean score of usage of smart phone in teaching learning, assessment of Arts student is 103.44 and science student is 108.15. The calculated ‘t’ value is .033 is significant at 0.05 level. Thus the hypothesis is rejected.

Hypothesis 6: There is no significant difference between usage of smart phone in teaching learning, assessment and Medium of instruction at college of the student teacher.

The mean score of usage of smart phone in teaching learning, assessment of students from Tamil medium background is 105.99 and students from English medium background is 105.96. The calculated ‘t’ value is .994 is not significant at 0.05 level. Thus the hypothesis is accepted.

Hypothesis 7: There is no significant difference between usage of smart phone in teaching learning, assessment and Type of Institution of the student teacher

The mean score of usage of smart phone in teaching learning, assessment of Government college students is 109.73 Private college students is 101.17 and Aided college students is 108.27. The calculated 'f' value is .002 is significant at 0.05 level. Thus the hypothesis is rejected.

Hypothesis 8: There is no significant difference between the General usage pattern, Teaching and Learning, Preparation of Teaching Content, Extra courses and Examination and connectivity and Data Storage.

The statistical analysis reveals that the correlation is significant at 0.01 level. Hence it indicates that there is significant relationship between the General usage pattern, Teaching and Learning, Preparation of Teaching Content, Extra courses and Examination and connectivity and Data Storage. Thus the hypothesis is rejected.

Hypothesis 9: There is no significant difference between usage of smart phone in teaching learning, assessment and Smart phone usage access and experience.

The statistical analysis reveals that the correlation is not significant. Hence it indicates that there is no significant difference between the usage of smart phone in teaching learning, assessment and Smart phone usage access and experience. Thus the hypothesis is accepted.

5.4 Recommendations

Based on the study the following recommendations were made.

- Workshops can be arranged to discuss on various options available through smart phone to create teaching content.
- Students Teachers awareness about usage of smart phone in teaching learning and assessment should be created.
- Teacher Educators can provide knowledge and information about using smart phones in teaching learning and assessment.

- Teacher Educators should provide students with opportunities to strengthen their smart phone usage in teaching learning and assessment.
- The findings underscore the importance of considering age-related factors when studying smartphone usage patterns among student populations. Researchers and practitioners in fields such as education, psychology, and technology may use these insights to tailor interventions, educational programs, or technological solutions to address the specific smartphone usage needs of different age groups.
- Researchers and educators may need to explore other demographic, social, or environmental factors that could influence smartphone usage behaviours among student populations.
- Researchers and educators may use these insights to develop targeted interventions, programs, or educational strategies aimed at promoting responsible smartphone usage habits among students at different stages of their academic journey.

5.5 Suggestions for Future Study

The present study has been focused on the usage of smart phones among student teachers college students in Coimbatore City. The present investigation has directed to desirable areas for the further research.

- Studies can be taken up in other districts also for more accuracy and better reliability .Similar studies can also be attempted at national and state level.
- Future research can replicate this study on a larger scale with a more diverse sample at varied settings.
- A comparative study could be carried out on the views of students from two different districts or two different states.
- The problems faced by the student teachers in using smart phone in teaching learning and assessment shall be studied.
- This study shall be extended to students from various streams.
- The statistical analysis provides robust evidence that there is a significant relationship between age and smartphone usage among students, highlighting the need for further investigation and targeted strategies to better understand and address smartphone usage behaviours across different age cohorts.

- Further research may be needed to identify other factors that could contribute to variations in smartphone usage behaviours.
- Further research may be needed to explore the underlying factors driving these differences and to develop effective interventions to address them.

5.6 Conclusion

The study examined various factors related to smartphone usage in teaching, learning, and assessment among student teachers. Here's a summary of the findings:

- Gender: Significant differences were found between male and female student teachers' smartphone usage, rejecting the hypothesis of no difference.
- Age: Differences in smartphone usage were observed across different age groups of student teachers, rejecting the hypothesis of no difference.
- Level of Education: No significant difference was found in smartphone usage between undergraduate and postgraduate student teachers, supporting the hypothesis.
- Year of Education: Significant differences were found in smartphone usage between first and second-year student teachers, rejecting the hypothesis.
- Subject Major: Differences in smartphone usage were observed between arts and science student teachers, rejecting the hypothesis.
- Medium of Instruction: No significant difference was found in smartphone usage between Tamil and English medium student teachers, supporting the hypothesis.
- Type of Institution: Significant differences were found in smartphone usage among student teachers from different types of colleges, rejecting the hypothesis.
- General Usage Patterns: Significant relationships were found between various aspects of smartphone usage, rejecting the hypothesis of no relationship.
- Smartphone Usage Access and Experience: No significant difference was found in smartphone usage based on access and experience, supporting the hypothesis.

In summary, while some factors like gender, age, year of education, subject major, and type of institution influence smartphone usage among student teachers, others like level of education and medium of instruction do not show significant variations. Additionally, there are significant relationships between different aspects of smartphone usage.

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ANNEXURE

INSTITUTIONAL HUMAN ETHICS COMMITTEE

Avinashilingam
Institute for Home Science and Higher Education for Women
(Deemed to be University under Category 'A' by MHRD,
Estd. u/s 3 of UGC Act 1956) Re-accredited with 'A^{++}' Grade by NAAC.
Recognised by UGC Under Section 12 B
Coimbatore-641043, Tamil Nadu, India

Date: 15-03-2024

To
Uma Maheswari V,
Department of Education
Avinashilingam Institute for Home Science and Higher Education for Women,
Coimbatore – 641043

Dear Uma Maheswari V,

Ref: Your proposal No. AUW/IHEC/23-24/EDU-020/05-02-2024.

The Institutional Human Ethics Committee of our University hereby grants approval to your research entitled 'Usage of smart phone among student teachers in teaching learning and assessment'. The Approval number for the same is AUW/IHEC/23-24/EDU/XMT-020.

We wish you all the best in your research endeavours.

Institutional Human Ethics Committee

15.3.24

Dr. A Thirumani Devi
Member Secretary

"Questionnaire"

For

Usage of Smart Phones among Student Teachers in Teaching Learning and Assessment

PART A: Personal Data

1. Name:_____

2. Age:

3. Gender

4. Level of education: Undergraduate / Post Graduate

5. Name of the college:

6. Subject Major:

7. Medium of instruction at college:

8. Type of Institution: Government / Aided / Self-Finance

PART B Smart phone usage access and experience

1. How many years have you been using smart phone?
   >1 year
   1-3 years
   3-5 years
   <5 years

2. Which type of learner (though smart phone app) do you consider yourself to be?
   Beginner
   Moderately active participant
   Active participant

3. How much is your monthly smart phone bill approximately?
   Less than Rs.300
   Rs.300-500
   Rs.500-1000
   Greater than Rs.1000

4. What operating system does your smart phone have?
   iOS
   Android

5. What is your frequency of using internet from your smart phone?
   >1 hour
   1-2 hours
   2-3 hours
   More than 3 hours

6. No.of smart phones owned
   1
   2
   3
   More than 3

7. No. of smart phones changed during the last 2 years
   1
   2
   3
   More than 3

8. How many sim cards are you using?
   1
   2
   More than 2

9. What mobile network are you using?
   Airtel
   Vodafone
   Jio

10. What is brand of your mobile?
    Samsung
    Apple
    One plus
    Lenovo
    Vivo
    Realme
    Redmi

PART C General Usage pattern of smart phone

Activities	Never	Rarely	Often	Always
1. I use Google maps and navigation in my smart phone.				
2. I use reminders in my smart phone to remind me on my important activities.				
3. I use calculator in my smart phone.				
4. I use smart phones to scan documents				
5. I use smart phone to listen to audio pods				
6. I use alarms in my smart phone.				
7. I think I can pass through a day without my smart phone.				
8. How frequent do you switch off your smart phone?				
9. I use my headphones with my smart phone.				
10. I set auto download of images and videos in messaging applications.				
11. I unconsciously use my cell phone to check if I have any calls or msgs				
12. I use swipe keyboard for typing in my smart phone.				

PART D Usage pattern for Teaching Learning

Activities	Never	Rarely	Often	Always
1. I use Google assistance in my smart phone for searching information.				
2. I use audio recording to record classroom teaching.				
3. I use smart phone to take important notes.				
4. I use Google classroom through my smart phone.				
5. I use online labs in my smart phone.				
6. I am aware of online teaching platforms.				
7. I use smart phone to discuss with my teachers regarding subjects.				
8. I play educational games in my smart phone.				
9. I do quizzes in smart phone phones.				
10. I use dictionary in smart phone.				
11. I use smart phone to watch education videos.				
12. I use smart phone to download and read PDF books.				

PART E Usage pattern for Extra courses and Examination

Activities	Never	Rarely	Often	Always
1. I use smart phone to fill online applications (TNPSC TET).				
2. I use smart phone to download hall ticket.				
3. I use smart phone for online exam registration and payments.				
4. I use smart phone to access online library.				
5. I use smart phone for reading blogs				
6. I use smart phone to watch YouTube videos related to studies.				
7. I watch demonstrations /animations regarding to my subject in my smart phone.				
8. I watch awareness programs in my smart phone.				
9. I watch tutorials (stitching, drawing, painting, fashion etc.)				
10. I download apps related to my studied.				
11. I will search for articles related to my studies.				
12. I will download PPTs related to my subject for further reference.				

PART F Usage pattern for Preparation of teaching content

Activities	Never	Rarely	Often	Always
1. I prepare visual presentation with the help of my smart phone				
2. I prepare graphics with the help of my smart phone				
3. I prepare assignments with the help of my smart phone.				
4. I prepare charts with the help of my smart phone				
5. I create video contents using my smart phone				
6. I incorporate audio video images and texts by using my smart phone.				
7. I get instant study materials with the help of my smart phone.				
8. I prepare online quizzes to know their understanding				
9. I prepare pictorial representation for teaching in my smart phone.				
10. I post blogs for my class by using smart phone.				
11. I can prepare graphs for my class in my smart phone.				
12. I prepare question paper in my smart phone.				

PART G Usage pattern of Connectivity and Data Storage

Activities	Never	Rarely	Often	Always
1. I organize folders to store teaching learning content in my smart phone.				
2. I am able to connect my smart phone to computer.				
3. I am able to connect my smart phone to projector.				
4. I use Google drive to store my documents				
5. I use secondary storage devices to store information in my smart phone.				
6. I use mobile phone to store certificates.				
7. I use mobile data to connect with my computer.				
8. I use Wi-Fi for internet connection.				
9. I use near share to share documents to the nearby device.				
10. I use VPN in my smart phone.				
11. I use near-field communications.				
12. I use screen cast to share with other display devices.				

0-Never 1-Rarely 2-Often 3-Always