Awareness of Digital Note-taking among College Students in Coimbatore District

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24PED010

A THESIS PROJECT SUBMITTED TO

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UNDER THE GUIDANCE OF

Mrs. S. ANDAL

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CERTIFIED AS BONAFIDE RESEARCH WORK

Signature of the Guide	Signature of the Head of the Department	Signature of the Dean of Education

DECLARATION

DECLARATION

I, **REETHIGA K**, hereby declare that the thesis entitled **"Awareness of Digital Note-taking among College Students in Coimbatore District"** submitted to Avinashilingam Institute for Home Science and a Higher Education for Women, Coimbatore, in partial fulfilment of the requirements for the award of the **Degree of Master of Education,** is a record of original and independent research work done by me during the period under the supervision and guidance of **Mrs. S. ANDAL, Assistant Professor (SS) and Head (i/c), Department of Education,** Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, and it has not formed the basis for the award of any Degree/ Diploma/ Associateship/ Fellowship or other similar title to any candidate of this or any other University.

Signature of the Student **Signature of the Guide**

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INTRODUCTION

1.1 BACKGROUND OF THE STUDY

With the advancement of the digital era, the current education system has been generally influenced by rapid technological development, which has led to transformations in how students learn, interact academically, and engage in the teaching processes. In the traditional classroom setting, students used paper and pen to take down notes from classes and reading materials. Note-taking can be defined as an essential part of the educational process, because it helps students understand and memorize information more effectively. With the constant improvement of technology, the practice of traditional note- taking using paper is slowly being replaced with digital note-taking using technological gadgets such as phones, tablets, laptops, and computers. This has made it possible for students to store more information, easily access academic resources and manage their academic activities systematically. Digital note-taking has also been encouraged in Indian Universities through initiatives supported by the University Grants Commission, as well as through websites such as Swayam that provide digital academic resources for students in many different areas of study.

In the current scenario, students attending colleges are increasingly experiencing digital classroom settings wherein the course material, assignments,and references are available in the form of digital content. Thus, the expectation is that students will use the digital devices not only for the purpose of communication and entertainment but even for academic purposes such as taking notes, managing study material and even revising course material. However, efficient use of digital note-taking is contingent on the knowledge of students regarding digital devices along with it's usage provided. Students who may make heavy use of digital devices may not necessarily be aware of their capabilities in terms of organised note-taking and good academic outcomes. It becomes imperative to measure the awareness of students regarding digital note-taking in an advanced educational sector such as that of Coimbatore District whenever several colleges use digital technology. This could help in formulating appropriate measures for promoting academic success.

1.2 NOTE-TAKING CONCEPT IN THE EDUCATIONAL CONTEXT

Note-taking is an academic skill that greatly improves the efficacy of learning in educational settings. This concept refers to the systematic recording of important information and concepts

obtained from sources of education such as lessons, books, conversations, and other resources. In the course of learning, learners obtain large amounts of information. Note-taking helps them identify the most important information points and organise them for future application. Note-taking in education is considered an active learning process by educational psychologists due to the attention and understanding required while listening or reading. Note-taking involves cognitive processes such as summarization, paraphrasing and recognition of essential ideas, leading to improved understanding and memorization of the information. Whereas, note-taking should not be viewed as simple writing down information.

In colleges, note-taking becomes crucial when helping learners deal with difficult subjects and huge volumes of academic information. Usually, the process of taking notes in higher education involves writing them down on paper using a pen; this has been common practice in classrooms over many years. This facilitates an individual's ability to express thoughts in his/her words while structuring knowledge according to his/her understanding. Nevertheless, with the development of technology in the field of education, the concept of note-taking has expanded beyond mere handwriting of ideas. Learners now have the opportunity to make use of technological gadgets in collecting, editing, and storing information digitally. Irrespective of the method of note-taking used, its main purpose remains unchanged; that is, to facilitate learning, improve memory and provide a reliable source of reference material.

1.3 EMERGENCE OF DIGITAL NOTE-TAKING

The coming up of digital note-taking is due to the fast development of ICT in the field of education. The majority of college learners are using electronic devices like mobile phones, laptops, tablets and computers. The use of electronic gadgets allows learners to use applications and software to take notes, change them, organise them and save the notes as digital information. Digital note-taking provides students with an opportunity to type quickly, save many notes and recall them anytime required, since they differ from hand written notes. Internet development has contributed to the increased use of digital notes because it has allowed students to save their notes online and access them any time needed. Institutions of higher education are encouraging students to utilise digital resources such as e-books, video lessons, slideshows and online learning management systems.

The transition from conventional no taking to digital note taking has been further strengthened due to the increased presence of technology within institutions of higher learning. Most universities now

give access to digital classrooms, Internet connectivity and study materials online. The access makes it easier for the learners to adopt digital note-taking and abandon the practice of using pens and notebooks for writing. Digital note-taking can be made easy for some students through the highlighting of key concepts, inclusion of images and creation of audio recordings in addition to sharing notes with other people. Digital note-taking seems superior to traditional note-taking in several ways. Nevertheless, one needs to master the use of digital technologies in order to exploit their benefits. There are many students who are familiar with digital technology but lack knowledge on how to use it for academic purposes. It is important to understand the evolution of digital note-taking because of its relationship with awareness of students at universities.

1.4 MEANING OF AWARENESS IN EDUCATIONAL RESEARCH

According to the literature review of education- related concepts and studies, awareness is one of the terms that refers to the level of knowledge and understanding a person has regarding some notion, practice, or technology. Thus, awareness is a key element invalid in whether your person is making proper use of various available learning resources. In contemporary education, students are introduced to a variety of technologies and different ways of studying via electronic platforms and applications, but their ability to make use of such opportunities is greatly dependent on their awareness of these opportunities' existence, functionality, and significance. Besides knowledge about the existence of a particular technology are resources, awareness implies knowledge of its purpose, the timing of its use, and the rationale behind such technology. Awareness is commonly researched in order to understand whether students have enough information to properly employ available educational resources.

Awareness in this case means the level of knowledge and understanding of digital note-taking approaches among college students. An example of awareness of digital note-taking includes an individual's ability to understand note-taking software applications, digital storage of notes, the advantages of having digital notes over handwritten ones, and utilization of digital means of recording notes while undertaking my learning process. College students who have high levels of awareness can effectively make use of digital note-taking approaches, while those who lack awareness tend to stick to conventional note-taking methods even when they have access to advanced technological means of doing so. Awareness of college students is critical in that it enables them to adapt to new learning approaches as part of modern society. From an educational research perspective, it is important to assess awareness in order to address the gap that might exist.

1.5 DIGITAL TRANSFORMATION

Digital transformation in higher education refers to the adoption of digital technology in the process of teaching, learning, administration, and academic communication. Initially, higher education involved conventional classroom-based learning and printer study materials and hand written assignments. Therefore, with the development of ICTS, there have been peculiar changes within the educational fields. Technology transformation by using technologies like smart classrooms, internet-based learning, e-books and computer laboratories is being witnessed in colleges and universities in order to enhance the educational experience. Technology transformation has transformed education into an easy, interesting and flexible field for learners. With the help of technology transformation, not only the process of teaching has changed but also the learning process. Hence, students need to have digital skills to practice paid effectively in current educational environments.

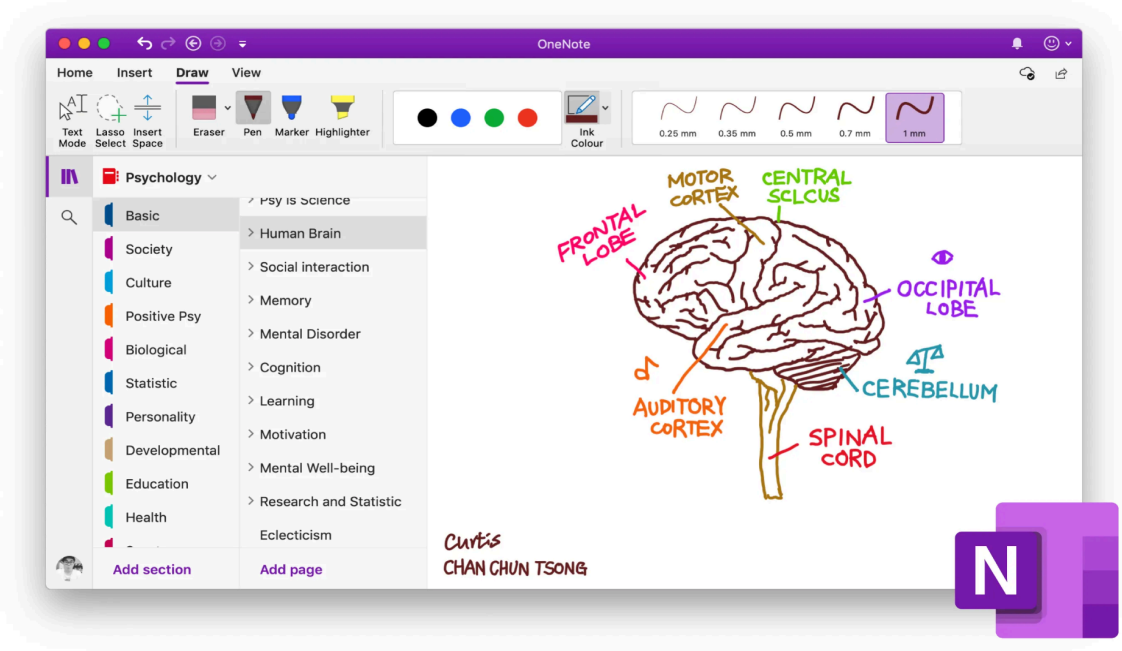

Fig. 1.1 OneNote Digital Note-taking Resource

The Indian government has ensured that digital transformation within higher education is embraced through initiatives and policies in education. Educational institutions like the University Grants Commission have encouraged the incorporation of digitalized education materials in college and university studies for quality education. Digital learning sites like Swayam provide free educational courses, videos and digitalised learning materials for students in the nation. In addition, the

incorporation of the National Educational Policy of 2020 emphasized the importance of integrating technology into the learning process. Many higher learning institutions in India provide Wi-Fi access, digitalized libraries, LMS and online exams that encourage use of technology in the education process. Consequently, the current education system in India requires that one has digital competence in order to excel academically.

Due to the above transition, students now find themselves using digital devices to perform assignments, attend virtual classrooms, and also take down lecture notes. Usage of note-taking in digital devices has become common due to the availability of study resources in digital forms including PDFs, PowerPoint presentations, and also audio lectures. This means that students can save and even edit and organize notes using applications available in phones or computers. Nevertheless, whether these methods will be effective depends on how acquainted the learners are with digital note-taking. While most universities have digitalized their services, some students may be unaware of the proper way of using these digital resources for learning purposes. It thus makes sense to analyze, considering the ongoing digital revolution in higher education, the degree of knowledge that exists regarding digital note-taking among university students, especially in the case of a progressive area like the Coimbatore District.

1.6 IMPORTANCE OF DIGITAL NOTE-TAKING FOR COLLEGE STUDENTS

Digital note-taking has become a very important learning practice and it should be implemented by college students in this modern age where technology plays an important role in the process of education. With most of the students using smartphones, tablets, and laptops during lectures, digital devices used to take notes are becoming increasingly possible. Digital notes can be revised, changed and organised based on the needs of each learner. Moreover, digital tools adopt highlighting, taking notes, inserting images and recording sounds, which makes the process of learning more effective and interesting. Finally, through the search function available in most digital note-taking programs students are able to find certain topics instantly.

A significant benefit of using digital note-taking is that it encourages self-directed and adaptable learning in college students. Students can access their notes anytime and anywhere through cloud storage or online tools, which is particularly useful for those taking online classes or using digital learning resources. Digital note-taking also promotes teamwork, since students are able to exchange their notes with peers via email or online platforms. This aids group learning and enhances

comprehension of challenging concepts. The successful use of digital note-taking relies on students' understanding of the available tools and their academic advantages. Some students might primarily use digital devices for socializing or entertainment and may not recognize their potential benefits for academic use. It is essential to examine the extent to which college students are familiar with digital note-taking methods in order to offer appropriate guidance and training that enhances their learning effectiveness.

1.7 NEED FOR THE STUDY

The current study is necessary because of the quick shift toward digital learning in higher education over the past few years. Colleges and universities are more frequently using digital technologies to enhance teaching and learning activities. The widespread use of smartphones, laptops, tablets, and internet access among college students has made digital learning a significant aspect of academic life. In higher education, online learning platforms, e-books, presentation slides, and recorded lectures are commonly used, prompting students to rely increasingly on electronic devices for their studies. Educational programs supported by organizations like the University Grants Commission and online learning platforms such as Swayam have enhanced the integration of technology in colleges. Therefore, digital note-taking has emerged as an effective way to record and organize academic information. Although digital tools are available, students are not always fully aware of how to use them effectively for learning. It is important to assess how aware college students are of digital note-taking methods.

Another key reason for carrying out this study is the limited amount of research that specifically examines digital note-taking awareness among college students in Coimbatore district. While numerous studies have explored the role of technology in education, very few have looked into how well students understand digital note-taking tools and their academic advantages within the local setting. Coimbatore district is home to many higher education institutions that offer strong technological resources; however, students may vary in their understanding, familiarity, and use of digital note-taking techniques. The study's results can help teachers, schools, and education planners create training programs, workshops, and support activities aimed at enhancing students' digital learning abilities. Therefore, evaluating awareness levels is essential for encouraging genuine digital interaction and ensuring the effective application of technology in higher education.

1.8 SIGNIFICANCE OF THE STUDY

The present study is significant as it helps to assess the level of awareness of digital note-taking among college students and promotes the development of effective digital study habits. It provides valuable insights for teachers to integrate digital note-taking strategies into their teaching practices. The findings support educational institutions in organizing training programs and workshops to improve students' digital competencies. It also assists curriculum planners in making informed decisions regarding the inclusion of digital literacy in academic frameworks. Furthermore, the study contributes to the existing body of knowledge in educational technology and serves as a reference for future research in higher education.

1.9 STATEMENT OF THE PROBLEM

The study examines college students' awareness of digital note-taking, referring to their knowledge and understanding of using digital tools for recording and organizing academic information. It also seeks to identify whether students are effectively utilizing available digital resources for academic purposes and learning improvement. Understanding this awareness is essential in the context of increasing digitalization in higher education. Hence, the problem is stated as: "Awareness of Digital Note-Taking among College Students in Coimbatore District."

1.10 OPERATIONAL DEFINITIONS

- **Awareness** refers to level of knowledge, familiarity, and understanding about digital note-taking.
- **Digital Note-Taking** refers to use of electronic devices and applications to record, organize, store, and retrieve academic information.
- **College Students** refers to Undergraduate and Postgraduate learners studying in Arts, Science, Commerce, Engineering, and professional colleges.
- **Coimbatore District** refers to the geographical area in Tamil Nadu where the study is conducted and sample is selected.

The study examines the level of knowledge, familiarity, and understanding of using electronic devices and digital applications for note-taking among undergraduate and postgraduate college students in Coimbatore District, Tamil Nadu.

1.11 OBJECTIVES OF THE STUDY

1. To assess the overall level of awareness of digital note-taking among college students in Coimbatore district (Avinashilingam Institute for Home Science and Higher Education for Women), including their knowledge of available tools, familiarity with their features and functions, and understanding of their academic usefulness.
2. To examine the level of awareness of digital note-taking among college students.
3. To compare the level of awareness of digital note-taking among college students across different Academic streams, Stream of study, Age group, Year of study, Area of locality, Fathers' occupation, Mothers' occupation and Socio-economic status.
4. To identify the major sources through which college students become aware of digital note-taking.

1.12 HYPOTHESES OF THE STUDY

The following null hypotheses are formulated for the present study:

1. There is no significant difference in the level of awareness of mean scores of digital note-taking among college students with respect to stream of study.
2. There is no significant difference in the level of awareness of mean scores of digital note-taking among college students with respect to age group.
3. There is no significant difference in the level of awareness of mean scores of digital note-taking among college students with respect to year of study.
4. There is no significant difference in the level of awareness of mean scores of digital note-taking among college students with respect to area of locality.
5. There is no significant difference in the level of awareness of mean scores of digital note-taking among college students with respect to socio-economic status.

1.13 VARIABLES OF THE STUDY

- In the present study titled "Awareness of Digital Note-taking among College Students in Coimbatore District," **Awareness of Digital Note-Taking** is the **dependent variable**. It refers to the level of knowledge, familiarity, and understanding of digital note-taking tools and practices among college students.

- The **independent variables** are those factors which may influence this awareness, namely Age group, Stream of study (type of major), Year of study, and Locality (rural/urban). In addition, Fathers' occupation, Mothers' occupation, and Socio-economic status are considered as Socio-economic variables, which may also have an effect on the level of awareness.

  Thus, the study examines how these independent and Socio-economic variables influence the dependent variable, namely awareness of digital note-taking among college students in Coimbatore district.

1.14 DELIMITATIONS OF THE STUDY

Delimitations indicate the boundaries or constraints within which the current research is carried out. Each research study should establish its boundaries to ensure the investigation remains manageable and centered. This study is limited to students enrolled at the Avinashilingam Institute for Home Science and Higher Education for Women in Coimbatore district. The sample includes only students from this particular institution, so the study's results may apply only to such institutions. The research is limited to undergraduate and postgraduate students. Students pursuing diplomas and those attending school are excluded from the investigation.

The study is also limited regarding its methodology and the process used for data collection. The researcher utilized a quantitative survey approach, with data gathered through a structured questionnaire developed by the investigator. The information collected from the students is self-reported, meaning the reliability of the data relies on the truthfulness and comprehension of the participants. The research concentrates solely on assessing awareness of digital note-taking and does not aim to evaluate the actual performance or proficiency in using digital tools. Because of constraints related to time, resources, and access, the investigation is limited to the conditions mentioned above. Therefore, the study's findings should be understood in light of these limitations.

1.15 CONCLUSION

This chapter has presented an overview of the study on digital note-taking among college students in Coimbatore District by explaining the background and highlighting the shift from traditional to digital learning practices along with the importance of note-taking in academic success. It discussed the concept of note-taking, the emergence of digital note-taking, and the meaning of awareness in educational research, while also emphasizing the role of digital transformation in higher education.

The chapter further justified the need and significance of the study in a technology-driven learning environment and clearly outlined the statement of the problem, objectives, hypotheses, variables, scope, delimitations, and assumptions. Thus, this chapter provides a clear foundation for the study and leads to the review of related literature in the next chapter.

CHAPTER-2

LITERATURE REVIEW

CHAPTER II
LITERATURE REVIEW

2.1 INTRODUCTION

Digital technology has significantly transformed the field of education, especially in the way students take and manage their notes. In recent years, many college students have started using digital note-taking tools such as mobile applications, laptops, tablets, and cloud-based platforms like Google Docs and other note apps instead of traditional handwritten methods. These tools help students organize information easily, store large amounts of data, access notes anytime, and even collaborate with peers. However, the effective use of digital note-taking depends largely on students' awareness, which includes their knowledge about different tools, understanding of their benefits and limitations, and ability to use them properly for academic purposes. Although digital learning is growing rapidly, especially after the increase in online and blended learning practices, there is limited research focusing specifically on the level of awareness among college students in Coimbatore District.

Since Coimbatore is an important educational hub in Tamil Nadu with many higher education institutions adopting digital practices, it becomes essential to examine how far students are aware of digital note-taking and how it influences their learning. Therefore, this literature review aims to analyze existing studies related to digital note-taking awareness, identify important findings, and highlight the research gaps that justify the need for the present study.

2.2 PURPOSE OF THE LITERATURE REVIEW

The purpose of the literature review in the present study titled "Awareness of Digital Note-Taking among College Students in Coimbatore District" is to examine and analyze existing research related to digital note-taking practices, digital learning tools, and students' awareness and usage patterns in higher education. It aims to understand the concepts, theories, and previous findings associated with digital note-taking and its role in academic performance, organization of learning, and digital literacy. The review helps to identify the key variables, research methods, and major conclusions drawn by earlier researchers in both national and international contexts. It also assists in recognizing the research gaps, particularly with regard to studies conducted in regional settings like Coimbatore District. By reviewing relevant literature, the researcher can justify the need for the present study, refine the research objectives, develop appropriate tools for data collection, and build a strong theoretical

foundation for the investigation. Thus, the literature review provides direction, clarity, and academic support for the entire research work.

2.3 EXPERIMENTAL STUDIES ON NOTE-TAKING METHODS AND DIGITAL LEARNING EFFECTIVENESS

Mueller and Oppenheimer (2014) investigated the impact of note-taking methods on academic learning among 327 university students. The study utilized the note-taking format (handwritten versus laptop) as the independent variable, measuring performance on factual and conceptual questions as the dependent variables. After participants watched recorded lectures, took notes, and completed comprehension assessments, the results indicated that students who took handwritten notes exhibited superior conceptual understanding and retention. The researchers concluded that handwriting encourages deeper cognitive processing compared to verbatim laptop typing. This study is highly relevant to the present research, as it underscores the necessity for college students to develop an awareness of effective digital note-taking strategies to replicate these deeper cognitive benefits.

Agostinho et al. (2013) evaluated 80 university students to determine how note-taking interacts with multimedia learning. The independent variables included the presence or absence of note-taking and the specific type of multimedia materials used, while the dependent variables assessed cognitive load, retention, and transfer performance. Following multimedia-based lessons, post-tests, and cognitive load evaluations, the findings revealed that structured and effective note-taking significantly bolsters deeper cognitive processing. This research is particularly pertinent to the current investigation, as it highlights the importance of utilizing proper digital note-taking techniques to mitigate cognitive overload and optimize learning efficiency.

Kim and Sharp (2020) conducted an experimental study with 120 undergraduate students to compare different digital note-taking modalities. The independent variable was the specific digital method employed (stylus on a tablet versus keyboard typing), with dependent variables encompassing student retention, conceptual understanding, and overall engagement. Participants attended digital lectures and were assigned to either the stylus or keyboard condition. The results demonstrated that stylus-based note-taking notably enhanced both retention and conceptual grasp by promoting active engagement, summarization, and the visual organization of concepts. Conversely, keyboard typing frequently resulted in the passive transcription of information. Because stylus utilization fostered

deeper learning and improved academic performance, this study emphasizes the crucial need for students to be aware of how differing digital note-taking methods impact educational effectiveness.

Singer and Alexander (2017) conducted an experimental observation involving 90 undergraduate students. The study's independent variable was the format of the reading material (digital versus print), while comprehension, depth of processing, and task performance served as the dependent variables. After participants read texts in their assigned formats and completed subsequent tests, the data revealed that print reading yielded superior performance on complex comprehension tasks. Furthermore, the study found that digital annotation often led to shallow engagement when applied passively; however, the guided application of digital tools significantly improved student understanding. This indicates that educational effectiveness relies heavily on the active methodology of the user, making the study highly relevant to the present research's focus on promoting mindful and effective digital note-taking practices for meaningful learning.

Ebner and Holzinger (2007) conducted an experimental observation of approximately 200 university students. The research isolated the use of digital note-taking tools as the independent variable, measuring resulting student engagement, organization, and self-directed learning as the dependent variables. Students integrated digital tools into their standard coursework and were subsequently evaluated through performance metrics and surveys. The findings indicated that utilizing dedicated applications substantially improved both student engagement and the organization of academic materials, largely by supporting multimodal note-taking and seamless cross-device accessibility. Additionally, collaborative features within these tools enhanced peer-to-peer learning. Importantly, the authors noted that the mere presence of technology was insufficient without deliberate, guided usage. This underscores the primary focus of the present study: emphasizing the critical need for awareness and the strategic implementation of digital note-taking tools among college students to secure optimal learning outcomes.

2.4 STUDIES ON DIGITAL NOTE-TAKING, MULTITASKING, AND SELF-REGULATED LEARNING IN HIGHER EDUCATION

Lin and Bigenho (2011) in an experimental study examined the intersection of multitasking and note-taking behaviors among 100 undergraduate students. The findings revealed that engaging in digital note-taking concurrently with multitasking significantly diminished recall scores, whereas handwritten note-taking fostered superior memory retention. The authors concluded that the

distractions inherent in digital environments frequently precipitate shallow cognitive processing and cognitive overload. However, they also noted that when digital tools are utilized with focused intent, overall effectiveness improves. Consequently, this study underscores the critical need for college students to develop an acute awareness of digital distractions and to cultivate disciplined digital note-taking practices.

Wan Ng (2012) investigated digital literacy within higher education through a survey-based study of 200 pre-service teachers. Utilizing structured questionnaires and quantitative analysis, the study framed technical, cognitive, and socio-emotional skills as independent variables. These were analyzed against the dependent variable: the effective application of digital tools for academic tasks, notably note-taking. The results indicated that while students possessed a foundational awareness of digital tools, they exhibited a deficit in higher-order critical thinking skills. Ng identified digital note-taking as a fundamental pillar of overall digital literacy, emphasizing that targeted guidance and structured training are imperative for enhancing students' digital competencies. This research is highly relevant as it underscores the necessity of targeted skill development to optimize academic outcomes through digital platforms.

Bui, Myerson, and Hale (2013) in an experimental investigation evaluated the strategies of 120 undergraduate students engaged in online learning environments. The study manipulated the note-taking approach (verbatim transcription versus generative summarizing/paraphrasing) as the independent variable to assess its effect on the dependent variables of memory retention and conceptual understanding. The findings demonstrated that generative methodologies, such as summarizing, significantly outperformed verbatim transcription, which proved largely ineffective for deep learning. Furthermore, structured strategies such as outlining and concept mapping bolstered memory, while the integration of multimedia facilitated comprehension through dual-coding processes. This study is pertinent to the current research as it highlights that the awareness and application of active note-taking *strategies*, rather than the mere presence of digital tools, are vital for academic success.

Winne and Hadwin (1998) proposed a foundational model of self-regulated learning that contextualizes these digital practices. Rather than relying on empirical sampling, this conceptual framework delineates metacognitive knowledge, strategic deployment, active monitoring, and feedback mechanisms as central, independent components driving the ultimate outcome of enhanced learning. The model elucidates how learners autonomously plan, monitor, and reflect upon their

educational processes. Within this framework, digital note-taking tools are viewed as instrumental for organization, progress tracking, and material revision. When utilized purposefully, these applications elevate metacognitive control, fostering deep reflection and cultivating efficient, independent learners. This theoretical perspective directly informs the present study by connecting the deliberate use of digital note-taking to the facilitation of self-regulated learning.

Dell, Newton, and Petroff (2016) conducted a descriptive and qualitative examination of inclusive note-taking practices among 60 higher education students with disabilities. By assessing the implementation of digital assistive tools (the independent variable), the researchers evaluated dependent outcomes including accessibility, note-taking efficacy, retention, and learning independence. Data aggregated from observations, interviews, and performance assessments revealed that digital tools substantially enhanced the accessibility and organization of academic notes, while simultaneously supporting collaboration and task management. Crucially, the study found that personalized adaptation of these tools is required to maximize their efficacy. This research highlights the benefits of inclusive digital note-taking and emphasizes the importance of recognizing supportive digital features to promote academic engagement across diverse learner populations.

2.5 STUDIES ON DIGITAL NOTE-TAKING TOOLS, MULTIMEDIA LEARNING, AND ACTIVE LEARNING STRATEGIES IN HIGHER EDUCATION

Cromley and Azevedo (2009) observed approximately 100 undergraduate students to compare the efficacy of tablet-based versus handwritten notes. The independent variable in this study was the mode of note-taking, while the dependent variables encompassed organization, information retrieval, student engagement, and overall academic performance. By assigning students to different note-taking methods during instructional sessions, the researchers found that tablet-based notes yielded superior organization and searchability. Specifically, digital features such as tagging, audio recordings, and image integration significantly elevated the quality of the notes. Furthermore, these digital tools fostered higher engagement and greater efficiency during the review process, ultimately leading to enhanced comprehension and memory recall. This research is highly relevant to the present study, as it underscores how an awareness and utilization of digital note-taking tools can substantially improve learning outcomes among college students.

Mayer (2009) established a comprehensive theoretical framework for multimedia learning, elucidating how students process information within digital environments. Rather than relying on a

single sample, this framework was synthesized from multiple experimental studies focusing on multimedia presentation formats (text, images, and audio) and their subsequent impact on learning outcomes. Mayer's cognitive theory emphasizes three core principles: dual channels for processing, limited cognitive capacity, and the necessity of active processing. The findings indicate that learners achieve optimal understanding when information is strategically organized across both visual and verbal modalities. While the effective integration of text, imagery, and audio enhances comprehension and memory retention, poorly designed multimedia can induce cognitive overload. This theoretical framework is vital to the current research because it emphasizes that an awareness of how to properly design and utilize digital note-taking features is essential for maximizing academic performance.

Harman and Koohang (2005) investigated collaborative digital learning among 75 undergraduate students utilizing a descriptive case study approach. The study identified the use of Evernote, a digital note-taking application as the independent variable, measuring its effects on dependent variables such as peer collaboration, digital literacy, and student engagement. Through a combination of surveys, behavioral observations, and usage analytics of shared notebooks, the researchers determined that Evernote significantly facilitated collaborative interactions. Built-in organizational features, including tagging, search functionalities, and multimedia support, allowed for seamless accessibility and more effective revision strategies. Consequently, the application notably boosted overall student participation and engagement levels. This study is highly pertinent to the current investigation, as it highlights how an awareness of collaborative digital note-taking tools can be leveraged to enhance academic success.

Kiewra (1985) conducted an experimental study of note organization and its impact on learning involving approximately 120 undergraduate students in. The independent variable in this research was the structural format of the notes (structured versus unstructured), while the dependent variables evaluated encoding efficiency, information retrieval, and long-term retention. After attending lectures under varied note-taking conditions, students who employed structured note formats demonstrated superior encoding capabilities and enhanced memory retention. These structured notes supplied more effective retrieval cues, thereby promoting deeper cognitive processing compared to unstructured notes, which consistently yielded poorer learning outcomes. Although conducted prior to the modern digital era, this foundational study remains highly relevant, as it emphasizes the critical need for awareness regarding structural organization—a feature prominent in modern digital note-taking—to elevate academic performance.

Freeman et al. (2014) executed a comprehensive meta-analysis evaluating instructional methodologies, analyzing data from over 29,000 students across 225 independent studies. The primary independent variable was the instructional paradigm (active learning versus traditional lecturing), while the dependent metrics focused on examination performance and overall course failure rates. The findings revealed that active learning environments not only significantly elevated exam scores but also drastically reduced failure rates when compared to traditional lecture formats. By fostering increased peer interaction, better cognitive organization, and deeper conceptual understanding, active learning directly enhanced students' problem-solving skills and academic achievements. While not exclusively centered on note-taking, this meta-analysis aligns perfectly with active learning principles. It is fundamentally relevant to the current research because it validates the necessity of utilizing digital note-taking tools that promote active, meaningful engagement rather than passive transcription.

2.6 STUDIES ON DIGITAL LEARNING BEHAVIORS, COLLABORATIVE NOTE-TAKING, AND COGNITIVE PROCESSING IN HIGHER EDUCATION

Salomon and Almog (1998) formulated a theoretical framework to examine digital learning behaviors. Utilizing a conceptual approach rather than a fixed empirical sample, their study investigated key variables such as digital involvement (active versus passive), mental effort, self-control, and memory retention. The researchers posited that the active application of digital tools significantly enhanced deep cognitive processing and memory. Strategic practices, including organization, summarization, and multimedia integration, proved highly effective, whereas passive usage escalated cognitive load and diminished learning efficiency. Furthermore, the authors underscored the indispensable role of self-regulation in digital learning environments. This research is highly pertinent to the current investigation, as it emphasizes the critical need for awareness and the purposeful employment of digital note-taking instruments to achieve superior academic outcomes.

Chen and Huang (2014) evaluated the behaviors of 84 undergraduate students using a quasi-experimental investigation of collaborative learning . The study isolated the note-taking method (collaborative mobile versus individual) as the independent variable, measuring its impact on dependent variables such as learning achievement and cognitive load. Participants were stratified into collaborative and individual note-taking cohorts. The results demonstrated that collaborative mobile note-taking not only elevated academic achievement scores but also mitigated cognitive load and the required mental effort. Furthermore, notes generated within collaborative environments were notably

more structured and comprehensive, thereby fostering active learning, intrinsic motivation, and critical thinking skills. This investigation directly informs the present study by illustrating how an awareness and application of collaborative digital note-taking platforms can substantially elevate educational outcomes.

Young (2016) conducted a quasi-experimental evaluation assessing the efficacy of digital note-taking tools among a sample of 90 undergraduate students. The research designated the utilization of Microsoft OneNote as the primary independent variable, analyzing its influence on organization, knowledge retention, class participation, collaboration, and self-regulated learning. Through a combination of academic assessments and surveys, the study observed students navigating structured digital notebooks. The findings revealed that OneNote significantly streamlined information organization and expedited data retrieval. Additionally, the platform bolstered long-term retention and stimulated active academic engagement. The software's collaborative features facilitated robust group interaction, while its framework encouraged self-regulation through systematic review and reflection. This literature is particularly relevant to the current study, affirming that an awareness and integration of structured digital note-taking applications are vital for augmenting academic performance.

Veletsianos (2012) explored the online learning behaviors of approximately 40 participants enrolled in Massive Open Online Courses (MOOCs). The research analyzed digital note-taking and the use of collaborative tools as independent variables, assessing their impact on learner engagement, information management, and self-regulated educational outcomes. Data triangulation was achieved through interviews, learning analytics, and rigorous content analysis. The investigation determined that digital note-taking effectively facilitated non-linear, personalized learning trajectories, significantly aiding in the mitigation of information overload. Furthermore, collaborative sharing mechanisms heightened student engagement and participation, while the iterative processes of reflection and revision deepened comprehension and retention. This study contributes to the foundation of the present research by underscoring the necessity of flexible, collaborative digital note-taking practices to optimize academic success.

Van der Meer and Van der Weel (2017) conducted an experimental neurocognitive investigation into the effects of distinct writing modalities, observing a cohort of 20 university students. The researchers manipulated the writing method (stylus-based handwriting versus keyboard typing) as the independent variable to observe its effect on dependent variables encompassing memory, attention, and cognitive brain activity. Utilizing Electroencephalography (EEG) to map neural activation during

these tasks, the study discovered that handwriting stimulated expansive neural networks intrinsically linked to the learning process. In contrast, typing yielded restricted neural engagement indicative of shallower cognitive processing. Consequently, stylus-based digital writing facilitated more profound cognitive engagement and knowledge retention by merging the neurological benefits of traditional handwriting with the logistical advantages of digital platforms. This neurobiological perspective is crucial to the current study, as it validates the targeted use of specific digital note-taking modalities namely, stylus integration to significantly enhance educational outcomes.

2.7 RESEARCH ON EFFECTIVENESS, BENEFITS, AND LIMITATIONS OF DIGITAL NOTE-TAKING IN LEARNING ENVIRONMENTS

Stacy and Cain (2015) investigated digital note-taking practices within pharmacy education among a cohort of approximately 150 students. Note-taking modality (digital versus handwritten) served as the independent variable, with dependent variables measuring student engagement, retention, cognitive processing, and susceptibility to distraction. Utilizing surveys alongside performance comparisons, the researchers found that while digital methods provided superior convenience and organization, handwritten notes better facilitated deep cognitive processing. Furthermore, digital devices frequently introduced unwanted distractions. The authors concluded that effective utilization of technology requires guided, purposeful strategies, ultimately recommending a blended approach of digital and traditional methods. This investigation is highly relevant to the present research, as it reinforces the necessity for student awareness and the strategic application of digital techniques to elevate learning outcomes.

Iitaka (2020) evaluated social media-based digital note-taking among approximately 150 Japanese university students. The independent variables focused on the utilization of social media for note-sharing and reflective practices, while the dependent variables assessed engagement, motivation, peer collaboration, comprehension, and memory retention. Through surveys and content analysis of online student interactions, the data revealed that social media-integrated note-taking significantly boosted both engagement and collaboration, subsequently supporting deeper reflection and retention. Nevertheless, information overload and digital distractions emerged as notable challenges. The study concluded that structured application and proper guidance are prerequisites for success. Consequently, this research is pertinent to the current study because it emphasizes the importance of cultivating student awareness regarding both the advantages and inherent limitations of networked digital note-taking tools.

Willett, Goffin, and Isenberg (2015) investigated digital note-taking behaviors during data visualization tasks among approximately 2,030 participants. The study manipulated visualization tools and note-taking interfaces as independent variables, while evaluating the type of notes produced, structural organization, reasoning traceability, and collaborative efficacy as dependent variables. Data obtained via direct observation, think-aloud protocols, and interviews indicated that participants predominantly recorded subjective interpretations and hypotheses. However, a weak conceptual linkage between the written notes and the visual data compromised both clarity and consistency. The authors observed that poor note organization directly hindered analytical reasoning and collaboration, suggesting a critical need for platforms that better integrate and structure information. This research informs the present study by illustrating how an awareness of advanced digital features is essential for effective data handling and specialized learning tasks.

Sun and Li (2019) examined the relationship between digital note-taking and varied knowledge types in a sample of 120 undergraduate students. Using the note-taking modality (digital versus handwritten) as the independent variable, the researchers measured student performance across declarative, procedural, and conditional knowledge frameworks as the dependent variables. Based on data collected from achievement tests and structured learning activities, the findings indicated that while both modalities equally supported factual (declarative) knowledge acquisition, digital note-taking distinctly improved both procedural and conditional knowledge. The integration of multimedia, seamless editing, and digital organization promoted strategic thinking and elevated cognitive processing. This study aligns closely with the current investigation, emphasizing how an awareness of digital note-taking's unique structural advantages can be leveraged to achieve higher-order academic outcomes.

Mosleh et al. (2016) investigated the inherent challenges of digital note-taking among a cohort of 100 university students. The researchers defined the specific digital tools and their interface designs as independent variables, while evaluating cognitive load, system usability, distraction frequency, and overall effectiveness as dependent variables. Data aggregated through interviews and questionnaires revealed that digital note-taking often increased both cognitive load and susceptibility to distraction, frequently demanding greater mental effort than traditional handwriting. Furthermore, technical glitches negatively impacted both efficiency and usability. The authors stressed that user-centered interface design and comprehensive student training are vital for mitigating these issues. This study serves as a critical anchor for the present research, reinforcing the need for balanced awareness regarding both the pedagogical benefits and the cognitive challenges of digital note-taking to ensure its effective application.

2.8 RECENT STUDIES ON DIGITAL NOTE-TAKING METHODS, SELF-REGULATION, AND LEARNING EFFECTIVENESS IN HIGHER EDUCATION

Romero and Remón (2023) analyzed tablet-based note-taking practices within higher education through a mixed-methods study involving approximately 180 undergraduate students. The researchers defined tablet note-taking methods and specific device features as independent variables, measuring their impact on dependent variables such as student engagement, organizational capacity, overall effectiveness, distraction levels, and typing efficiency. Utilizing data derived from questionnaires and focus group discussions, the findings indicated that tablets significantly enhanced flexibility, organizational structure, and the integration of multimedia elements, while also facilitating collaborative learning and material review. However, participants reported notable challenges, specifically increased susceptibility to distractions and reduced typing speeds compared to traditional laptops. The authors concluded that effective tablet utilization necessitates structured guidance and training. This study is highly relevant to the present research as it fosters a nuanced awareness of both the distinct benefits and inherent limitations of tablet use for optimizing learning outcomes.

Artz et al. (2020) investigated note-taking methodologies among a cohort of approximately 250 undergraduate students. The study operationalized the note-taking medium (digital versus handwritten) as the independent variable to evaluate dependent outcomes including academic performance, recall accuracy, and conceptual understanding. Students were randomly assigned to specific note-taking modalities prior to assessment. The results corroborated earlier studies, demonstrating that handwritten notes yielded superior conceptual understanding and long-term retention. Conversely, while digital note-taking excelled in organizational efficiency, it frequently resulted in shallow cognitive processing, with its overall effectiveness heavily compromised by multitasking and digital distractions. Consequently, the researchers advocated for a blended approach that combines the strengths of both digital and traditional methods. This research informs the current study by emphasizing the necessity of recognizing the contextual advantages and limitations of digital platforms to achieve effective learning.

Shi (2022) conducted an investigation into digital note-taking for vocabulary learning among approximately 90 undergraduate English as a Foreign Language (EFL) students. The independent variable was the specific digital note-taking method employed, assessed against the dependent variables of vocabulary retention, contextual understanding, and student engagement. Data collected via pre-tests, post-tests, and supplementary questionnaires revealed that digital tools significantly augmented both vocabulary retention and accurate contextual application. The integration of multimedia features

stimulated active learning and deeper cognitive engagement, while inherent categorization and search functionalities optimized structural organization. Despite these benefits, the study identified technological overdependence and distractions as persistent challenges. This research is pertinent as it highlights how targeted digital note-taking strategies and multimedia utilization can directly elevate academic performance.

Chudaeva (2024) explored digital note-taking experiences specifically within online learning contexts, studying roughly 60 university students. The research identified digital devices and their respective note-taking platforms as independent variables, while evaluating organization, student engagement, cognitive load, and retention as dependent variables. Through the thematic analysis of interviews and student journals, Chudaeva found that digital note-taking markedly improved accessibility and organizational capacity, with multimedia features actively driving engagement. However, the study also revealed that digital distractions and concurrent multitasking significantly exacerbated students' cognitive load. Echoing other researchers, Chudaeva recommended a balanced integration of traditional and digital methods. This investigation underscores the vital awareness needed to navigate the dual nature both beneficial and burdensome—of digital note-taking in contemporary academic settings.

Calamlam (2023) investigated digital note-taking as a mechanism for self-regulated learning among 120 undergraduate students. The use of digital note-taking tools served as the independent variable, with academic performance, self-regulation capacity, engagement, and retention functioning as the dependent variables. Utilizing pre-tests, post-tests, and standardized self-regulation measures, the study demonstrated that digital note-taking positively correlated with heightened academic performance and retention. Furthermore, the tools fundamentally enhanced students' ability to organize material and monitor their own learning trajectories, leading to elevated engagement and active learning. The study also noted that equitable access to technology is a prerequisite for these benefits. This research directly supports the present study by linking digital note-taking awareness to the cultivation of academic self-regulation.

2.9 STUDIES ON DIGITAL MEMORY, LEARNING ENVIRONMENTS, AND THE IMPACT OF TECHNOLOGY USE ON ACADEMIC PERFORMANCE

In a seminal experimental investigation of cognitive offloading, **Sparrow, Liu, and Wegner (2011)** examined digital memory behavior in a sample of 119 undergraduate students. The researchers manipulated the participants' belief regarding their future access to information (the independent variable) and measured the subsequent recall of the information itself versus the recall of its storage location (the

dependent variables). Participants were tasked with entering and recalling trivia under varying experimental conditions. The findings revealed that students who expected to have future digital access to the information exhibited significantly lower recall of the actual content; instead, they demonstrated an enhanced ability to remember *where* the information was stored. This phenomenon, termed the "Google Effect," illustrates a heavy reliance on external digital memory and a consequent reduction in the deep cognitive encoding of information. This study is highly relevant as it cautions against over-reliance on digital storage, stressing the need for active encoding strategies in digital note-taking.

Aleven, McLaughlin, Glenn, and Koedinger (2009) synthesized findings across multiple studies involving 40 to 200 students to investigate adaptive digital learning environments. The independent variables comprised specific adaptive system features, including automated feedback, algorithmic hints, and instructional guidance. These were measured against the dependent variables of problem-solving accuracy, overall learning effectiveness, and student engagement. Through rigorous testing and observational assessments, the researchers found that adaptive tools substantially improved problem-solving capabilities and academic outcomes. These systems fostered effective study strategies, sustained active engagement, and successfully utilized guidance and feedback to scaffold self-regulated learning. This research is instrumental to the current study as it demonstrates how the deliberate and aware use of sophisticated digital tools can significantly enhance academic performance.

Garrison and Anderson (2003) proposed a comprehensive framework for understanding online learning environments. Rather than utilizing a fixed experimental sample, this conceptual study is heavily supported by case analyses. The framework posits three central, interdependent variables: teaching presence, social presence, and cognitive presence. These elements collectively dictate the dependent outcomes of student engagement, critical thinking capacity, and successful knowledge construction. According to the model, teaching presence provides essential planning and instructional guidance; social presence fosters peer interaction and collaborative dynamics; and cognitive presence drives deep reflection and conceptual understanding. The successful integration of these three presences is crucial for meaningful learning. This theoretical paradigm is highly relevant, as it emphasizes the awareness required to leverage digital tools in a manner that holistically supports cognitive, social, and self-directed academic development.

Luo and Hsiao (2019) investigated the intersection of digital literacy and mobile note-taking among 256 undergraduate students. The students' pre-existing level of digital literacy served as the independent variable, which was analyzed against the dependent variables of note-taking effectiveness, organizational

skill, speed of information access, and academic engagement. Analyzing data from structured questionnaires and digital usage records, the study revealed a strong positive correlation: higher digital literacy directly translated to superior organization and retrieval of notes. Furthermore, proficient students demonstrated increased efficiency in accessing information and exhibited greater overall engagement in learning activities. The findings suggest that baseline digital skills are a prerequisite for the effective exploitation of note-taking applications. This study informs the current research by highlighting that technological awareness and digital proficiency are inseparable from improved academic outcomes.

Fried (2008) conducted a quasi-experimental examination of laptop use and its impact on learning, involving 103 undergraduate students. The independent variable was the environmental condition of laptop availability during lectures (allowed versus restricted). The dependent variables encompassed conceptual understanding, memory retention, and overall academic performance. By comparing the two cohorts, Fried observed that students with laptop access spent significant instructional time engaged in non-academic activities. These digital distractions quantifiably degraded comprehension and memory retention, with the restricted group relying on handwritten notes demonstrating superior learning outcomes. The study concluded that the presence of digital tools in educational settings demands highly focused and strategic implementation to avoid detrimental effects. This research remains highly relevant as it underscores the critical need for disciplined digital note-taking practices to mitigate distraction and safeguard academic performance.

2.10 STUDIES ON SELF-REGULATED LEARNING, DIGITAL ANNOTATION, AND COGNITIVE FACTORS INFLUENCING NOTE-TAKING EFFECTIVENESS

Kuo, Walker, Schroder, and Belland (2014) with a sample of 236 students conducted an investigation into self-regulated learning (SRL) within online educational environments. The primary independent variable was the learners' level of self-regulated learning skills, while dependent variables evaluated the utilization of digital resources, student engagement, and overall academic satisfaction. Through the analysis of questionnaire data using regression models, the researchers determined that higher SRL proficiencies directly correlated with the more effective application of digital tools. Consequently, these students demonstrated superior engagement and satisfaction levels. The findings suggest that self-regulation fundamentally supports organizational capabilities and learning efficiency, thereby enhancing independent learning and academic achievement. This study is highly relevant to the present

research, as it underscores the necessity of awareness and the effective execution of digital note-taking tools to elevate overall learning outcomes.

Hollins (2019) examined digital annotation techniques in higher education, observing a cohort of 148 undergraduate students. The independent variable was the deployed annotation methodology (strategic versus passive), while the dependent variables assessed reading comprehension, critical analytical skills, and information retention. After training students in structured digital annotation techniques, the results indicated that active annotation significantly fostered higher comprehension and sharper critical thinking skills. Furthermore, this approach yielded superior retention rates when compared to passive reading habits. The study concluded that foundational digital literacy supports highly effective annotation practices, and guided strategies invariably lead to bolstered academic performance. This research provides pertinent context for the current study by highlighting how an awareness and proper implementation of digital note-taking techniques can drastically improve educational outcomes.

Peverly et al. (2015) conducted a study involving 186 undergraduate students. The research identified working memory capacity, handwriting speed, academic background, and personal beliefs regarding note-taking as independent variables, while the dependent variables measured the quality of the generated notes and subsequent recall performance. Utilizing lecture settings, cognitive assessments, and detailed note analysis, the data revealed that enhanced working memory and faster writing speeds significantly elevated note quality. Additionally, students' epistemological beliefs directly shaped their note-taking strategies, with more sophisticated strategies yielding improved recall and conceptual understanding. Ultimately, cognitive proficiency plays a pivotal role in note-taking efficacy. This study is relevant to the present investigation as it highlights the importance of awareness and strategic understanding in optimizing note-taking for academic success.

Hembrooke and Gay (2003) conducted an experimental study assessing the impact of laptop multitasking on learning, utilizing a sample of 44 undergraduate students. The independent variable was the specific condition of laptop usage (active multitasking versus the absence of a laptop), while dependent variables were quantified through comprehension and retention scores. Randomly assigned students were evaluated via post-lecture quizzes and recall tests. The findings demonstrated that multitasking fundamentally degrades both comprehension and memory performance, as non-academic digital activities act as severe distractors that disrupt the cognitive learning process. The researchers concluded that the highly focused, intentional use of laptops is essential for instructional effectiveness, emphasizing the critical role of self-control in achieving academic success. This study is highly relevant,

as it highlights the vital need for awareness regarding distraction management within digital note-taking environments to ensure optimal learning outcomes.

Davies, Hooper, and Rees (2017) evaluated 124 undergraduate students investigating tablet-based concept mapping as an alternative note-taking modality. The independent variable was the selected note-taking method (visual concept mapping versus traditional linear typing), and the dependent variables encompassed conceptual understanding, knowledge retention, and overall academic performance. By dividing students into two distinct methodological groups, the researchers found that concept mapping significantly improved conceptual clarity and the cognitive integration of complex ideas. This spatial approach enhanced long-term retention and facilitated more meaningful learning, whereas linear typing demonstrated comparatively shallower cognitive processing. The study underscores that structurally organized digital techniques strongly support deeper learning paradigms. This research is deeply relevant to the current study, as it emphasizes the necessity of awareness regarding advanced digital note-taking methodologies, such as concept mapping, to maximize academic achievement.

2.11 RESEARCH ON MULTIMEDIA DESIGN, METACOGNITIVE STRATEGIES, AND EFFECTIVE NOTE-TAKING FOR ENHANCED LEARNING OUTCOMES

Grabe and Christopherson (2008) authored an extensive synthesis of multimedia learning research within higher education, analyzing findings from a multitude of experimental and quasi-experimental studies. The independent variables comprised specific multimedia design elements, including text, static imagery, animation, narration, and interactivity. Correspondingly, the dependent variables evaluated information retention, comprehension depth, cognitive load management, and the practical application of knowledge. The comprehensive review concluded that meticulously designed multimedia substantially improves both understanding and memory retention, whereas poorly constructed materials frequently precipitate cognitive overload. Ultimately, effective digital design fundamentally supports deeper learning and optimal knowledge transfer. This synthesis is highly relevant to the present research, as it highlights how an awareness of integrated multimedia features within digital note-taking tools is crucial for enhancing student learning outcomes.

Salmerón, Baccino, Caon, and Longhi (2013) executed an experimental investigation into the application of metacognitive strategies during digital reading and note-taking involving 72 university students. The primary independent variable was the provision of metacognitive strategy support, while dependent variables measured reading comprehension, inferential ability, and strategic cognitive

processing. Operating within hyperlinked digital text environments under both guided and unguided conditions, students who received strategy-guided support consistently produced superior, more cohesive summaries. These students also exhibited stronger inferential reasoning and foundational understanding. The study determined that integrated metacognitive cues critically enhance information organization and reflective thought. This research is highly pertinent, as it highlights how an awareness of strategic digital note-taking protocols can significantly elevate reading comprehension and subsequent academic performance in the current study.

Bui and McDaniel (2015) conducted an experimental investigation into the efficacy of distinct digital note-taking strategies, sampling 120 undergraduate students. The independent variable categorized the note-taking approach (strategic summarization versus verbatim transcription), while the dependent variables evaluated recall accuracy, overall comprehension, and long-term retention. Following the observation of lectures where students utilized digital devices for note-taking, the data revealed that strategic methodologies, such as active summarizing, drastically improved educational outcomes. Conversely, verbatim typing correlated with significantly weaker comprehension and reduced retention capabilities. The findings confirm that active cognitive engagement is a prerequisite for optimal memory processing. This study is directly relevant to the current research, highlighting the vital awareness and application of active, effective digital note-taking strategies to bolster overall academic performance.

Hartley and Davies (2003) conducted a foundational critical review of note-taking literature synthesizing a wide array of studies on student learning mechanics. The independent variables across these studies involved various note-taking methodologies, including structured frameworks, traditional handwritten notes, and early digital formats. The dependent metrics focused consistently on comprehension, information retention, and broader academic achievement. By aggregating data from both experimental and observational contexts, the review established that active and highly organized note-taking systematically improves both understanding and memory consolidation. Specifically, practices like summarizing and structured formatting were shown to enhance learning outcomes, whereas disorganized or impoverished notes predictably diminished academic performance. This broad review remains relevant, emphasizing how a fundamental awareness of effective, structured digital note-taking strategies is imperative for elevating academic achievement in modern educational contexts.

Krämer and Winter (2008) examined the dynamics of digital communication and information management within online environments, surveying a cohort of 286 university students. The independent variables focused on individual personality traits and distinct online self-presentation styles, while the

dependent variables analyzed active digital communication behaviors and overarching information management competencies. Utilizing structured questionnaires for data collection, the researchers discovered that elevated digital literacy directly correlated with superior information organization and retrieval capabilities. Furthermore, students exhibiting structured online habits demonstrated enhanced communication efficiency, proving that those with refined digital skill sets manage expansive information networks far more effectively. This study holds substantial relevance for the current investigation, as it highlights how an awareness and mastery of foundational digital skills are critical for the optimal organization and utilization of digital note-taking platforms.

2.12 RESEARCH ON SELF-REGULATED LEARNING, COGNITIVE ENGAGEMENT, AND EFFECTIVE USE OF DIGITAL LEARNING TOOLS

Cook and Dupras (2004) conducted an investigation into online learning and self-directed study, involving a cohort of approximately 120 medical and health profession students. The researchers isolated features of the online learning environment, specifically interactivity, reflection, and self-evaluation—as independent variables, measuring their impact on dependent variables such as self-directed learning, reflective practices, and overall academic achievement. Through the implementation of structured online modules and corresponding assessments, the study revealed that active reflection substantially improved comprehension and knowledge organization. Furthermore, self-directed learning facilitated a more sophisticated utilization of digital resources, and heightened engagement directly correlated with superior academic performance. This study is highly relevant to the present research, as it underscores the necessity of fostering awareness regarding the self-regulated application of digital tools to optimize learning outcomes.

Roscoe and Chi (2007) executed an experimental investigation examining cognitive and metacognitive learning strategies among approximately 80 undergraduate students. The independent variables comprised distinct cognitive strategies, notably self-explanation and reflective thinking, while the dependent variables evaluated comprehension, conceptual understanding, and knowledge application. Participants were subjected to structured learning tasks under both guided and unguided conditions. The findings indicated that the practice of self-explanation markedly enhanced conceptual clarity and profound understanding, simultaneously augmenting students' capacity to apply acquired knowledge effectively. Conversely, passive learning modalities yielded significantly inferior comprehension outcomes. This

research informs the current study by highlighting how an awareness of reflective and strategic digital note-taking practices is instrumental in driving academic achievement.

Hew and Brush (2007) identified and analyzed the primary factors dictating the successful integration of technology in educational settings. Their framework delineated several critical components: technology availability (classroom access to digital tools), students' technical proficiency, institutional support (infrastructure and administrative guidance), and pedagogical methodologies (how instructors embed technology into curricula). The study posited that these factors directly influence student engagement, the effective and meaningful utilization of digital resources, and subsequent academic achievement. This conceptualization is deeply applicable to the present research, validating the premise that cultivating students' digital literacies and promoting the proper utilization of specific tools, such as note-taking applications, are foundational to enhancing learning efficacy and academic success.

Dabbagh and Kitsantas (2012) investigated the intersection of self-regulated learning (SRL) and the utilization of digital learning resources, surveying an estimated 210 undergraduate students. The researchers defined SRL as the overarching capability to meticulously plan, monitor, and manage personalized learning trajectories. The study differentiated between the awareness of SRL methodologies (e.g., goal-setting and organizational frameworks) and their practical application in academic endeavors. The results indicated a strong positive relationship between these SRL competencies, active student engagement, effective utilization of digital tools, and elevated academic achievement. This literature is highly pertinent to the current investigation, emphasizing that students equipped with robust planning, organizing, and self-monitoring competencies are significantly more adept at leveraging digital note-taking platforms to boost learning efficiency.

Zhang and Lu (2020) conducted a study involving approximately 180 undergraduate students. The research systematically evaluated concepts including digital note-taking (the technological recording and structuring of data), tool awareness (understanding interface features and functions), and practical knowledge (the applied competency to utilize these applications). Furthermore, the study measured outcomes related to information organization, reflective learning processes, academic engagement, and final academic achievement. The findings demonstrated that elevated levels of awareness and practical knowledge regarding digital note-taking tools empowered students to systematically organize information, engage more deeply with content, and achieve superior academic results. This aligns directly with the focal point of the present research, "Awareness of Digital Note-taking among College Students in Coimbatore District" by validating the causal link between tool awareness and academic success.

2.13 CONCLUSION

In conclusion,the reviewed studies collectively affirm that foundational digital literacy and self-regulated learning competencies are prerequisite for the optimized use of these educational technologies. Notably, however, there remains a pronounced deficit in empirical research localized to specific regional demographics, such as the Coimbatore District. This identified gap in the existing literature fundamentally justifies the necessity and focus of the present academic investigation.

CHAPTER-3

METHODOLOGY

CHAPTER III
METHODOLOGY

3.1 INTRODUCTION

The methodology is a vital part of a research study as it highlights the scientific way a researcher conducts the research. It includes the approach used, the research design, the target population, the sample, the sampling technique, the variables involved, the tools used to collect the data and the statistical tools used for analysis. A clear approach helps a researcher to collect precise and reliable information. In this study, "Awareness of Digital Note-taking among College Students in Coimbatore district" was measured with the aim of identifying the extent of awareness of digital note-taking tools among college students pursuing various disciplines. To conduct this research, a survey method, descriptive research design, a self-developed questionnaire, a pilot study, and statistical analysis were used. This chapter focuses on the methodology used for the current research study.

3.2 METHODOLOGY OF THE CURRENT STUDY

The researcher adopted the survey method in the present study. The survey method is relevant in the present study because the researcher is seeking to find information from a last group of students related to their level of awareness of digital note-taking. This method is effective in gathering data from various groups at the same time and the responses can be compared based on the stream of study, age group, locality, year of study, occupation of parents and socio-economic status. Since the aim of the study is to find the level of awareness and not to change the conditions in any way, the survey method is suitable in this study.

3.3 DESIGN OF THE STUDY

The study that is being undertaken in the current research is descriptive survey research. This type of research design is utilized to describe the current state or the existing level of awareness among the members of the group. In the current research, the researcher has attempted to find out the level of awareness among college students belonging to different fields of study regarding digital note-taking. Descriptive survey research is helpful in obtaining facts, comparing different groups and interpreting the outcomes in a significant manner. Therefore, descriptive survey design was suitable for this study.

3.4 STUDY POPULATION

This population of the current study consists of students from Arts & Science, Engineering, and Education streams who are pursuing their studies at Avinashilingam Institute for Home Science and Higher Education for Women, which is located in Coimbatore District. The students from these streams have different academic backgrounds and use digital devices for learning purposes.

3.5 STUDY SAMPLE

For any research study the selection of study selection of sample is very important. The sample of present study consisted of 300 college students studying in Avinashilingam Institute for Home Science and Higher Education for Women and were distributed equally among three streams namely, Arts & Science, Engineering, and Education to make a proper comparison and to know the awareness about digital note-taking among college students belonging to different academic streams.

Table.3.1

Sample Distribution based on Stream of Study

Stream of study	N
Arts & Science	100
Engineering	100
Education	100

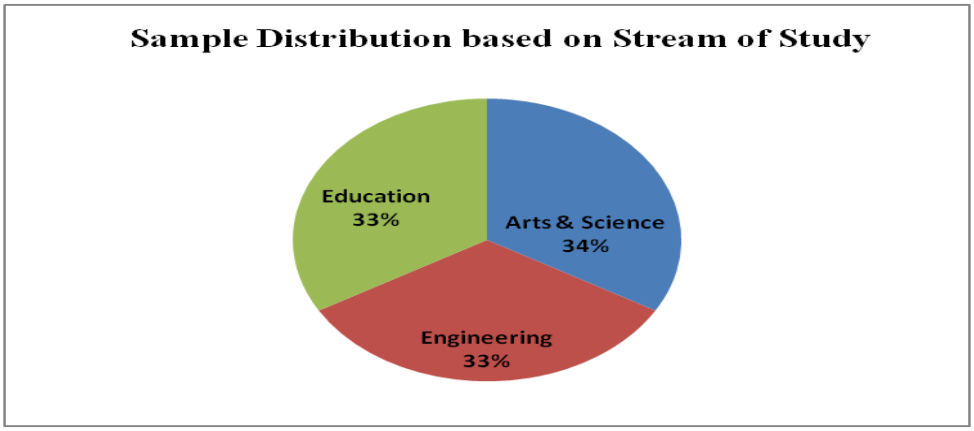

Fig. 3.1 Sample Distribution based on Stream of Study

3.6 SAMPLING TECHNIQUE

In this study, the investigator adopted “Simple Random Sampling” technique. In this method, all the students in the population have an equal opportunity to be included in the sample. The “Simple Random Sampling” technique is very useful in avoiding biases and provides an accurate representation of the entire population. The random samples are taken from the Arts and Science, Engineering and Education streams in the Avinashilingam Institute. So, the “Simple Random Sampling” technique is relevant to this current study.

3.7 STUDY VARIABLES

The main variable studied in this research was Awareness of Digital Note-taking and this variable has been treated as a dependent variable. The investigator has also employed a few classification of variables to study the awareness levels among students. The classification of variables are employed to find whether awareness levels differ among different categories of students.

Table.3.2

Variables of the Study

Variable		N	Total
Stream of study	Arts and Science,	100	300
	Engineering	100	
	Education	100	
Age Group	18-22 years	259	300
	23-27 years	35	
	above 28 years	6	
Year of Study	First year	140	300
	Second years	121	

	Third years	39	
Area of Locality	Rural	142	300
	Urban	158	
Gender	Female	300	300
Fathers' Occupation	Business	64	300
	Government job	36	
	Private job	72	
	Daily wages,	60	
	Agriculture	46	
	Not employed	22	
Mother's Occupation	Business,	24	300
	Government job	21	
	Private job	43	
	Daily wages,	36	
	Agriculture	19	
	Not employed	157	
Socio-economic status	Below Rs.25000,	143	300
	Rs.25000 to Rs.50000	120	
	Rs.50000 above	37	

3.8 TOOLS USED FOR DATA COLLECTION

In conducting the research, the investigator utilized a self-constructed and standardized tool in measuring the awareness of digital note-taking among college students. The tool was constructed by the investigator in accordance with the purposes of the research and reviewed literature. The tool has two components, which are Personal Data Sheet (Section A) and Awareness Scale (Section B). The tool was constructed in Likert scale format and utilized in gathering data from students.

3.9 TOOL CONSTRUCTION

The questionnaire was developed by the researcher to assess the awareness regarding digital note-taking by the students at the college level. Items were developed keeping in view the aim of the study, reviewed literature and recommendations of the research supervisor. This tool has been designed very carefully taking into consideration all the aspects of digital note-taking awareness. There are 4 dimensions in this tool and each dimension consists of 10 items. Thus there are forty items in total.

3.10 TOOL DIMENSIONS

This questionnaire was designed using four essential dimensions that are relevant to digital note-taking awareness. Every dimension includes 10 questions and all the dimensions collectively contribute to the assessment of a student's digital note-taking awareness comprehensively. The dimensions includes,

- Awareness and Knowledge of Digital Note-taking.
- Usage and Preferences of Digital Note-taking.
- Accessibility,Collaboration and Institutional Support.
- Attitude, Future Intentions and Health Issues.

3.11 ITEMS PREPARATION

The researcher developed 40 items for the survey. There are 10 items for each aspect such that all aspects of digital note-taking knowledge will be considered. The development of items was done in a way that they are easy to understand by the students. The developed items were reviewed by the experts for corrections.

3.12 QUESTIONNAIRE FORMAT

The questionnaire was created in Likert scale format. For pilot study, the questionnaire was distributed among the students of Ramakrishna College of Arts and Science, Coimbatore in printed format. As for the main research, Google form was used to distribute questionnaires online to the students of Avinashilingam Institute for Home Science and Higher Education for Women in Coimbatore District.

Likert Scale includes 5 answers like,

- Strongly Agree-5
- Agree-4
- Neutral-3
- Disagree-2
- Strongly Disagree-1

3.13 PERSONAL DATA INFORMATION (SECTION A)

This section deals with personal information about the students. It includes Institution name, Type of major (Arts and Science, Engineering and Education), Specified major, Gender, Age group, Year of study, Area of locality, Father's occupation, Mother's occupation and Socio-economic status of respondents. This helps in classifying the respondents for comparison in the awareness level of the students.

3.14 AWARENESS SCALE (SECTION B)

In section B of the survey questionnaire, there are items pertaining to digital note-taking awareness and preferences. Section B is composed of questions regarding knowledge on digital tools, frequency of use for educational purposes, devices used for note-taking and method of preferred note- taking. The answers were gathered through Likert scale measurement, which consists of five option scales like strongly agree to strongly disagree.

3.15 TOOL STANDARDIZATION

Standardization of the questionnaire has been done by M.Ed Student Reethiga K guided by Assistant Professor S. Andal, Avinashilingam Institute. The tool has been validated with the help of

pilot testing, validity and reliability checks. Post required modifications, the questionnaire has been finalized.

Table.3.3

Reliability Statistics Table

Cronbach's Alpha	**No. of items**
0.800	40

3.16 DATA COLLECTION PROCEDURE

For this study, data was collected from the students of Avinashilingam Institute.The data was collected after obtaining permission from the Institute. The questionnaire was made available on Google Forms, and the students were asked to provide their honest answers. Once all the data has been collected, it was organized for analysis.

3.17 STATISTICAL TECHNIQUES EMPLOYED

Various statistical techniques such as Percentage, Mean, Standard Deviation, t-test, and ANOVA were employed for analyzing the obtained results. Percentage technique was employed to get the student's distribution, while mean and standard deviation techniques were employed to calculate the student's average level of awareness. t-test and ANOVA techniques were employed to compare awareness among various groups.

3.18 CONCLUSION

In this chapter, the present study's methodology has been discussed. Survey technique and descriptive survey design have been used in this study. The entire population comprises students studying in colleges of Avinashilingam Institute. Out of this, 300 students have been selected for this study. A self constructed questioner has been employed as the instrument of the study, which has been standardized by conducting the pilot study and following expert's validation. At the end the data were gathered statistically analysed.

CHAPTER-4

DATA ANALYSIS AND INTERPRETATION

CHAPTER IV
DATA ANALYSIS AND INTERPRETATION

4.1 INTRODUCTION

In this chapter, a comprehensive analysis and interpretation of the data obtained from the research study titled "Awareness about Digital Note-taking among College Students in Coimbatore District" are made. It should be noted that the main goal of this chapter is to analyze the data obtained from the respondents in a systematic way and to interpret them in terms of the goals and hypotheses set out in the research study.

Descriptive statistics such as percentage, mean, and standard deviation along with t-test and ANOVA have been used in the analysis of the data. The results are then interpreted in a systematic manner.

4.2 DEMOGRAPHIC PROFILE OF THE RESPONDENTS

STREAM OF STUDY OF RESPONDENTS

Table 4.1

Stream of Study of Respondents

Stream of Study	**N**	**Percentage**
Arts & Science	100	33.3
Engineering	100	33.3
Education	100	33.3
Total	**300**	**100.0**

The table 4.1 reveals that there is an equal distribution of the participants across the three educational streams: Arts & Science, Engineering, and Education, each accounting for 33.3% of the entire sample size. Such equal distribution guarantees that there will be no bias due to any particular academic specialization, making the sample unbiased and reliable for comparisons across various fields.

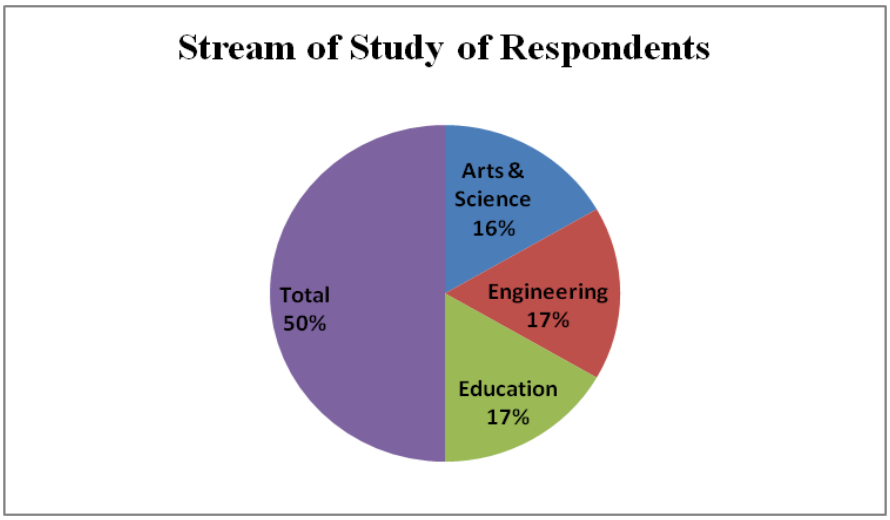

Fig. 4.1 Stream of Study of Respondents

AGE GROUP OF RESPONDENTS

Table 4.2

Age Group of Respondents

Age Group	N	Percentage
18-22 years	259	86.3
23-27 years	35	11.7
above 28 years	6	2.0
Total	**300**	**100.0**

From the above table 4.2, it is seen that a large number of the respondents (86.3%) fall into the category of ages 18 to 22 years, which implies that the vast majority of the respondents are college students. The number of people falling under the age bracket of 23 to 27 years is relatively small, being 11.7%, while those aged more than 28 years are just 2.0%.

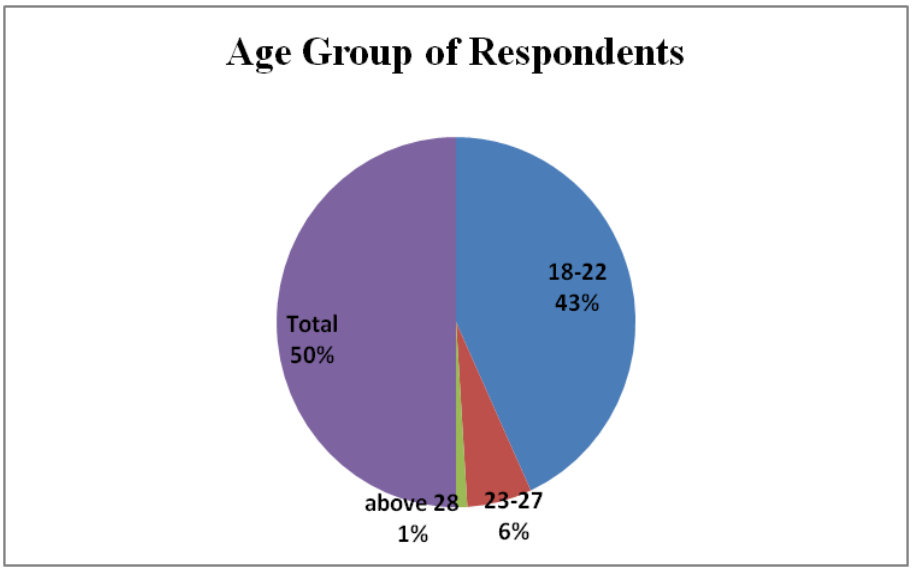

Fig. 4.2 Age Group of Respondents

YEAR OF STUDY OF RESPONDENTS

Table: 4.3

Year of Study of Respondents

Year of Study	N	Percentage
First year	140	46.7
Second year	121	40.3
Third year	39	13.0
Total	**300**	**100.0**

The Table:4.3 shows that 46.7% of the respondents are first-year students, followed by 40.3% second-year students, and 13.0% third-year students. This distribution indicates that the sample is largely composed of early-stage learners. It also suggests that exposure to digital note-taking practices begins early in academic life.

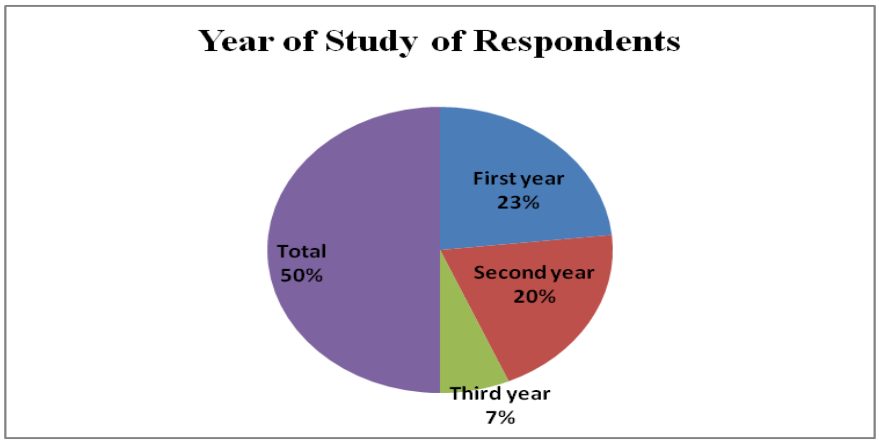

Fig. 4.3 Year of Study of Respondents

AREA OF LOCALITY

Table :4.4

Area of Locality of Respondents

Area of Locality of Respondents	N	Percentage
Rural/village	142	47.3
Urban	158	52.7
Total	**300**	**100.0**

The findings of the above Table: 4.4 indicate that 52.7% of respondents belong to urban areas, while 47.3% are from rural areas. The near-equal distribution reflects a balanced representation of students from different localities. This balance enables a fair comparison of digital awareness between rural and urban students.

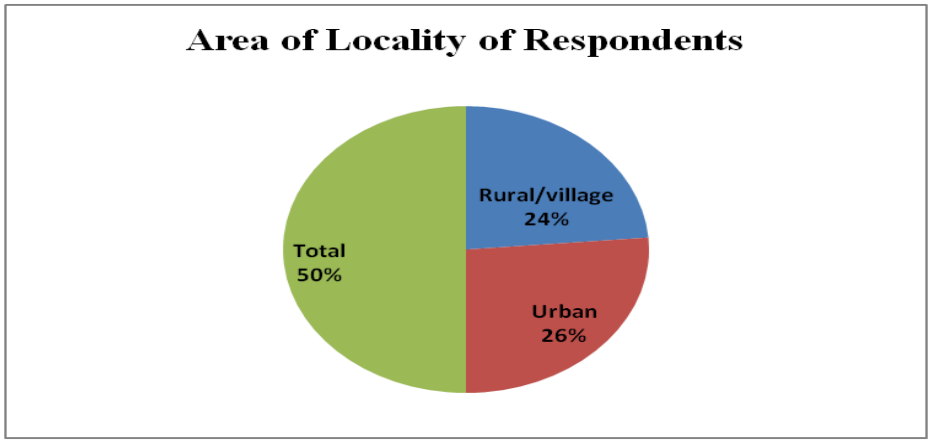

Fig. 4.4 Area of Locality of Respondents

FATHERS' OCCUPATION OF THE RESPONDENTS

Table.4.5

Fathers' Occupation of the Respondents

Fathers' Occupation of the Respondents	N	Percentage
Business	64	21.3
Government job	36	12.0
Private job	72	24.0
Daily wages	60	20.0
Agriculture	46	15.3
Not Employed	22	7.3
Total	**300**	**100.0**

The data shown in Table : 4.5 reveal that a majority of fathers are engaged in private jobs (24.0%) and business (21.3%), followed by daily wages (20.0%) and agriculture (15.3%). A smaller percentage are employed in government jobs (12.0%) or not employed (7.3%). This indicates a diverse occupational background, contributing to varied socio-economic conditions among respondents.

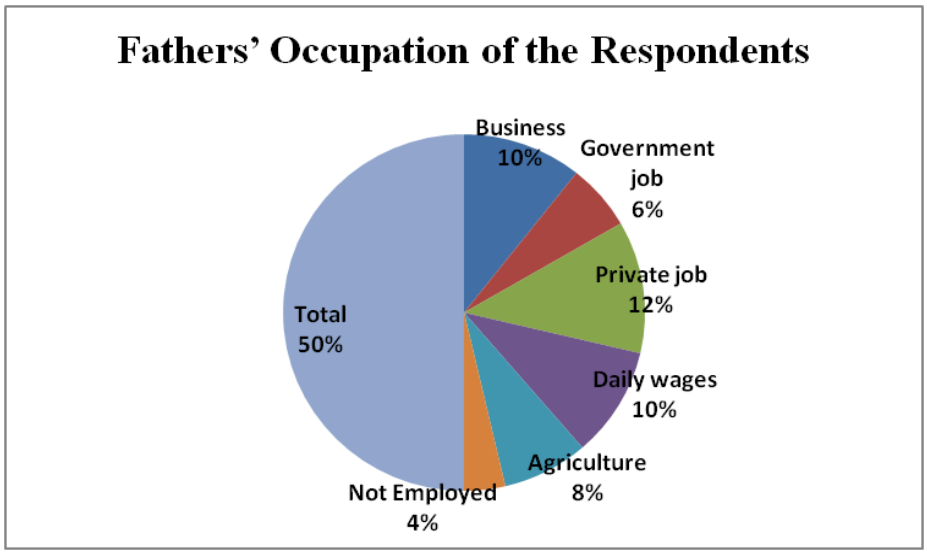

Fig. 4.5 Fathers' Occupation of the Respondents

MOTHERS' OCCUPATION OF THE RESPONDENTS

Table.4.6

Mother's Occupation of the Respondents

Occupation	N	Percentage
Business	24	8.0
Government job	21	7.0
Private job	43	14.3
Daily wages	36	12.0
Agriculture	19	6.3
Not Employed	157	52.3
Total	**300**	**100.0**

The results of Table: 4.6 show that the majority of mothers (52.3%) are not employed, while others are engaged in private jobs, business, daily wages, and agriculture. This suggests that a significant proportion of respondents come from households where mothers are homemakers, which may indirectly influence students' learning environment.

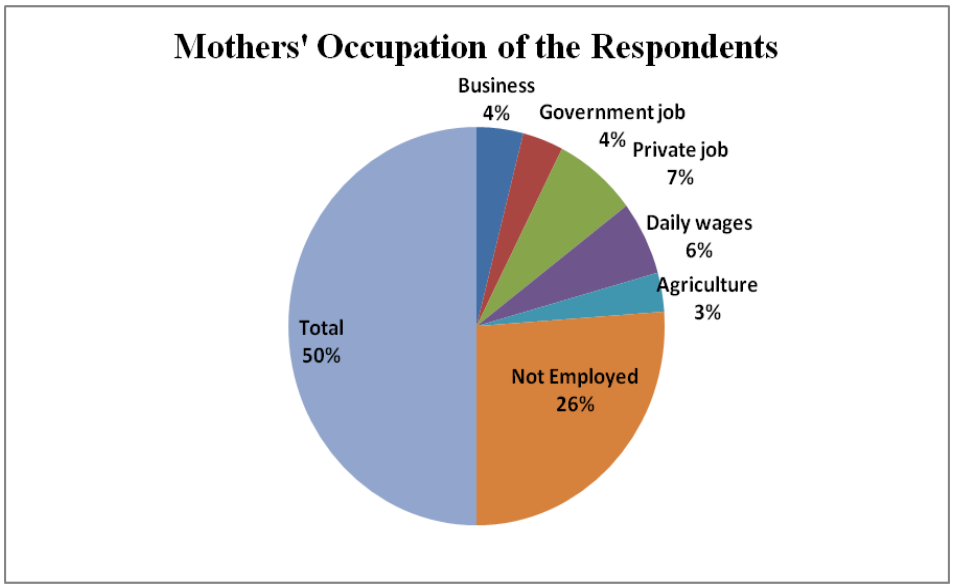

Fig. 4.6 Mothers' Occupation of the Respondents

SOCIO-ECONOMIC STATUS OF THE RESPONDENTS

Table.4.7

Socio-Economic Status of the Respondents

Income per month	**N**	**Percentage**
below Rs.25000	143	47.7
Rs. 25000 - Rs.50000	120	40.0
Rs. 50000 and above	37	12.3
Total	**300**	**100.0**

The findings indicate that 47.7% of respondents belong to the below ₹25,000 income group, followed by 40.0% in the ₹25,000–₹50,000 range, and 12.3% above ₹50,000. This shows that most respondents come from lower and middle socio-economic backgrounds.

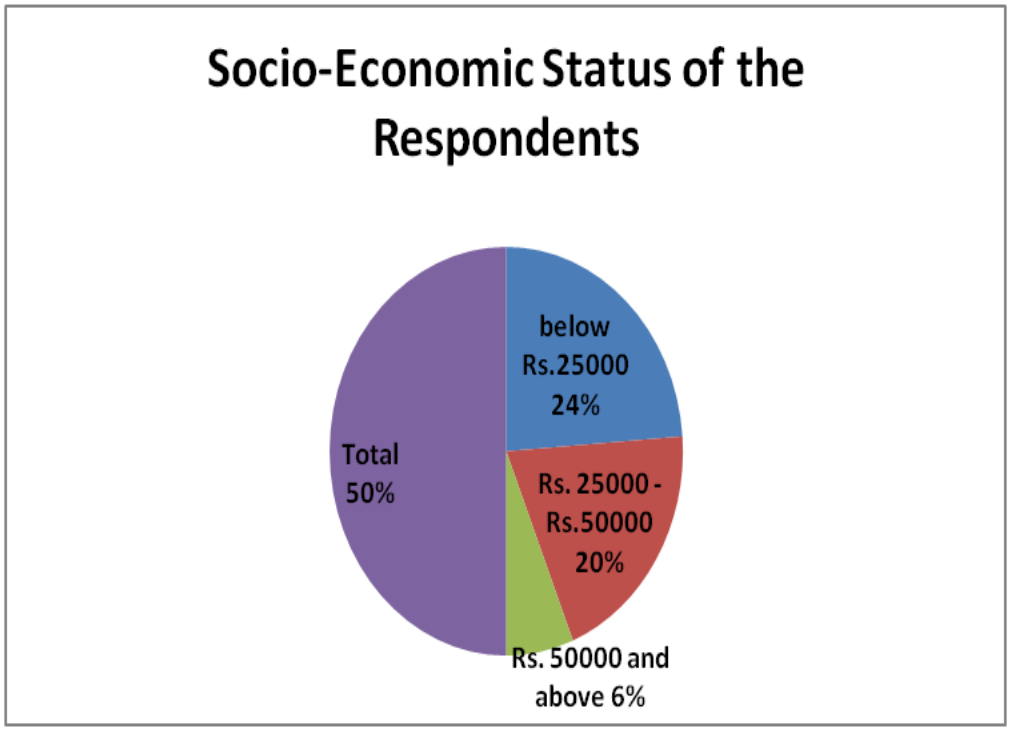

Fig. 4.7 Socio-Economic Status of the Respondents

4.3 ANALYSIS OF DIGITAL NOTE-TAKING AWARENESS

FAMILIARITY WITH DIGITAL TOOLS FOR THE NOTE-TAKING APP

Table.4.8

Familiarity with Digital Tools for the Note-taking App

Familiarity with Digital Tools	N	Percentage
Beginner	153	51.0
Intermediate	120	40.0
Advanced	27	9.0
Total	**300**	**100.0**

The data reveal that 51.0% of respondents are beginners, 40.0% are at the intermediate level, and only 9.0% are advanced users. This indicates that while students are aware of digital tools, most are still in the early stages of proficiency.

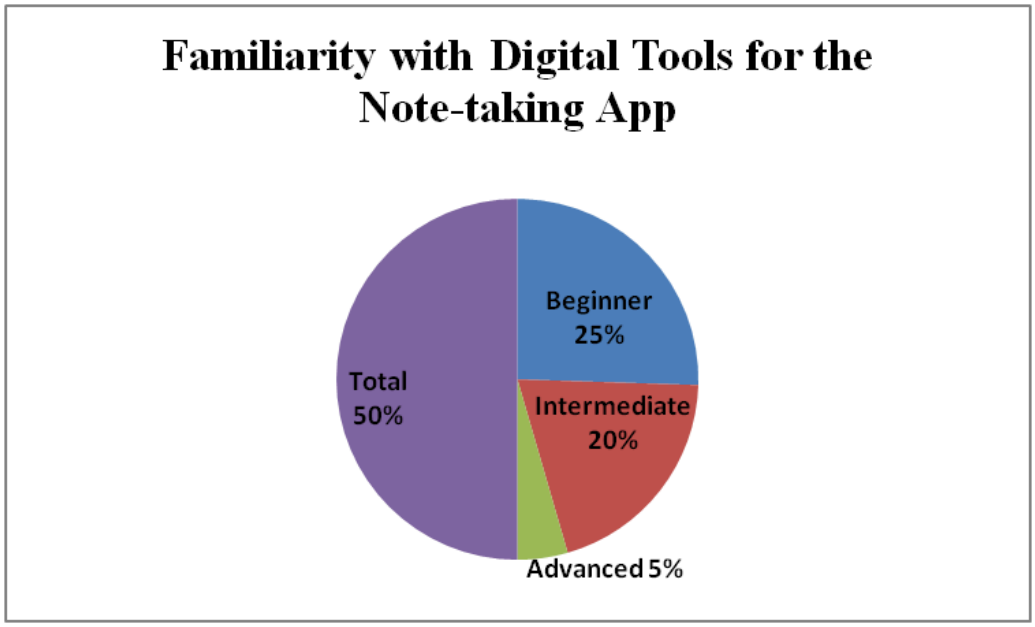

Fig. 4.8 Familiarity with Digital Tools for the Note-taking App

FREQUENCY OF DIGITAL DEVICE USAGE FOR ACADEMIC PURPOSE

Table.4.9

Frequency of Digital Device Usage for Academic Purpose

Frequency of Digital Device Usage for Academic Purpose	N	Percentage
Daily	103	34.3
A few times a week	102	34.0
Occasionally	46	15.3
Rarely	34	11.3
Never	15	5.0
Total	**300**	**100.0**

The results show that 34.3% of students use digital devices daily, while 34.0% use them a few times a week. A smaller proportion use them occasionally or rarely. This suggests a moderate level of engagement with digital tools for academic purposes.

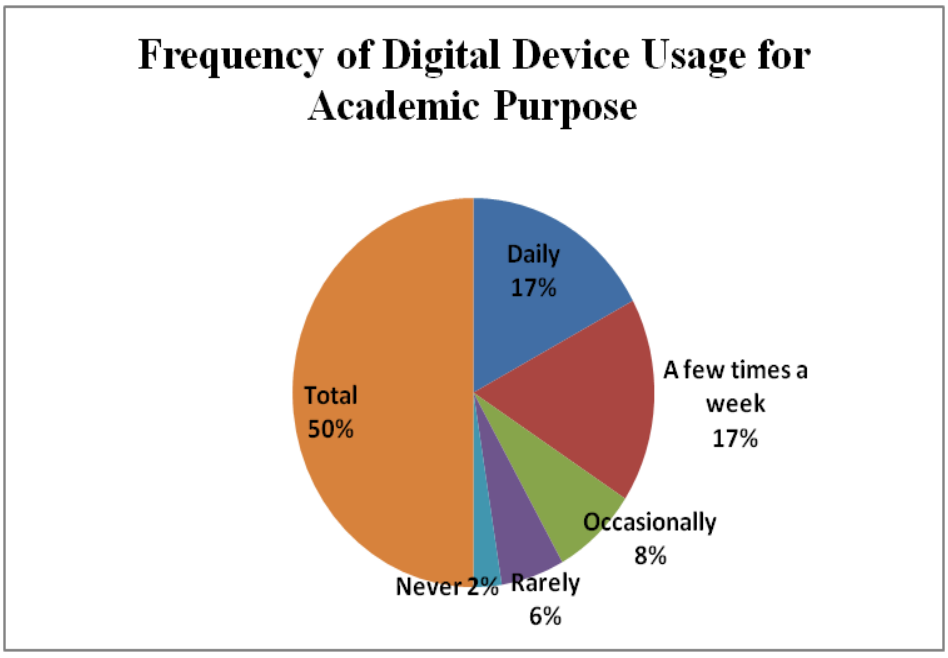

Fig. 4.9 Frequency of Digital Device Usage for Academic Purpose

DEVICES USED FOR NOTE-TAKING

Table.4.10

Devices Used for Note-taking

Devices used for Note-taking	N	Percentage
Laptop	64	21.3
Tablet	10	3.3
Smartphone	164	54.7
Computer	18	6.0
Digital writing pad	14	4.7
None	30	10.0
Total	**300**	**100.0**

The majority of respondents (54.7%) use smartphones for note-taking, followed by laptops (21.3%). Very few use tablets or digital writing pads. This indicates that smartphones are the most accessible and preferred device among students.

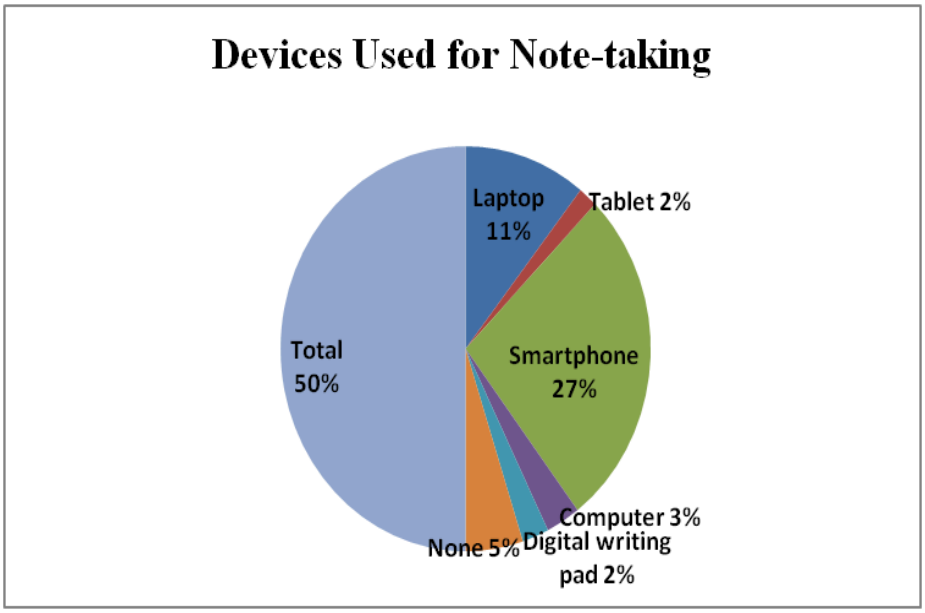

Fig. 4.10 Devices Used for Note-taking

PREFERRED NOTE-TAKING METHOD

Table.4.11

Preferred Note-taking Method

Preferred Note-taking Method	N	Percentage
Digital	67	22.3
Traditional	94	31.3
Mixed	139	46.3
Total	**300**	**100.0**

The findings reveal that 46.3% of students prefer a mixed method, combining both traditional and digital note-taking. While 31.3% prefer traditional methods, only 22.3% rely solely on digital methods. This suggests a transitional phase where students are gradually adopting digital practices.

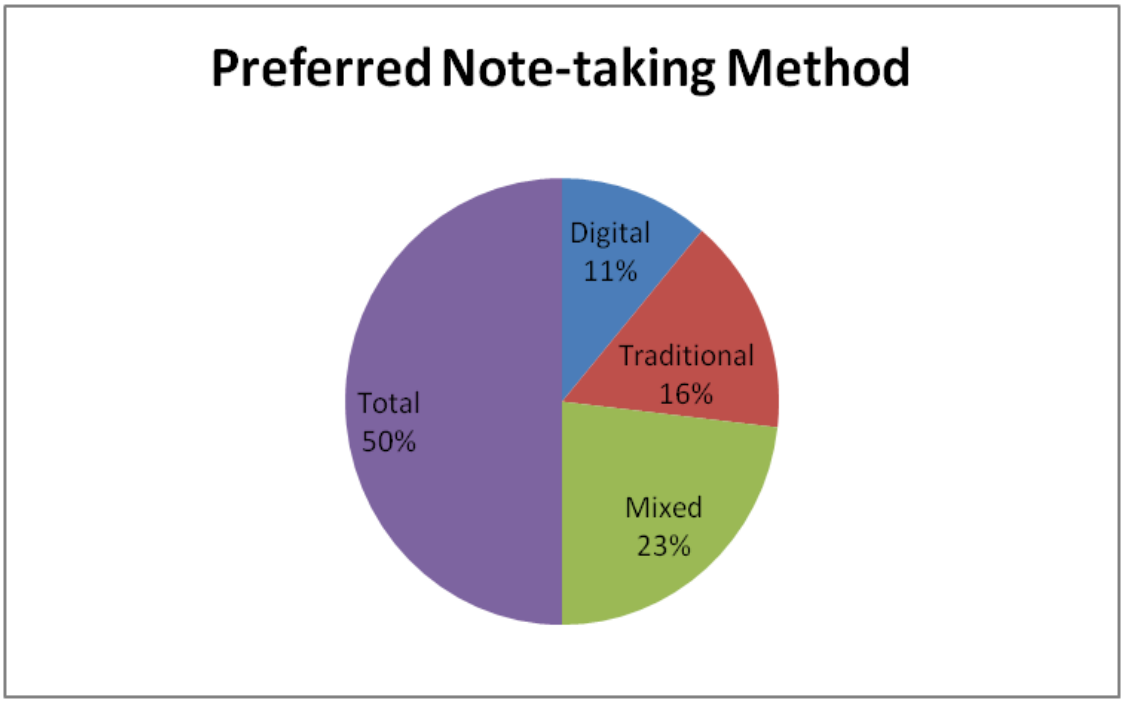

Fig. 4.11 Preferred Note-taking Method

DESCRIPTIVE STATISTICS OF DIGITAL NOTE-TAKING SCORES OF STUDENTS

Table.4.12

Descriptive Statistics of Digital Note-Taking scores of Students

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	**Statistic**	**Statistic**	**Statistic**	**Statistic**	**Statistic**	**Std. Error**
Digital Note-taking Scores	300	80	154	123.95	10.11146	0.176	0.141
Valid N (listwise)	300						

From Table 4.12 it is seen that the mean of the Digital Note-Taking scores is 123.95 and the Standard deviation is 10.11. The Skewness is 0.176.

Level of Digital Note-taking among Students

For classifying the sample into different levels on the basis of their Digital Note-taking scores, the σ distance from mean μ was calculated. Those who obtained scores equal to or greater than μ + 1σ were labeled as *High* group, those with less than or equal to μ - 1σ called as *Low* group and those who came in between these were categorized as *Average* group. The categorization of the students into different levels of Digital Note-taking of Students is presented in Table 4.

Table 4.13

Number and Percentage of Students Falling into Different Levels of Digital Note-taking Scores

Variable	Group	Score	*n*	%
Digital Note-taking	High	≥ 134.06	50	16.67
	Average	134.06 – 113.84	218	72.67
	Low	≤ 113.84	32	10.66
	Total		**300**	**100**

Table 4.13 says that among 300 samples, 50 Students have obtained high scores and are classified as high groups. 16.67 percent constitutes the high group. 72.67 percent falls into the average group and 10.66 percent of students are classified as a low group based on the Digital Note-Taking scores.

4.4 HYPOTHESIS TESTING

Ho1 There is no significant difference in the mean scores of Digital Note-taking among Students based on the Stream of study

Table: 4.14

Descriptive Statistics of Digital Note-Taking scores of Students based on the Stream of study

Stream of study	**Digital note-taking score**		
	Mean	**S.D**	**N**
Arts & Science	122.88	8.09	100
Engineering	123.09	11.05	100
Education	125.88	10.75	100
Total	**123.95**	**10.11**	**300**

The descriptive statistics table shows the digital note-taking (DNT) scores of students across different types of majors. Students from Education have the highest mean score (Mean = 125.88, SD = 10.75), followed by Engineering (Mean = 123.09, SD = 11.05) and Arts & Science (Mean = 122.88, SD = 8.09). The overall mean score is 123.95 with a standard deviation of 10.11. The descriptive table shows there are some differences in mean scores and SDs among the groups.

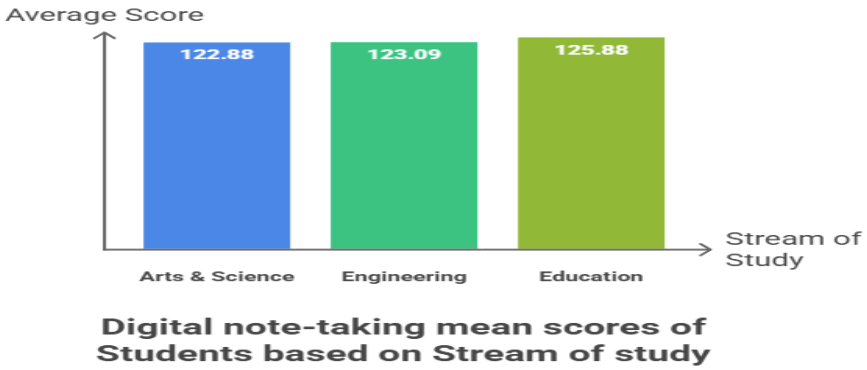

Fig. 4.12 Digital note-taking mean scores of Students based on Stream of study

In order to find whether the differences between the groups are statistically significant, the following hypothesis was framed and tested:

Ho_1: There is no significant difference in the mean scores of digital note-taking among Students based on Steam of study.

Table: 4.15

ANOVA of Digital note-taking scores based on Stream of study

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	560.940	2	280.470	2.776	NS
Within Groups	30009.310	297	101.041		
Total	**30570.250**	**299**			

Critical value: 3.026, NS – Not significant

The ANOVA results show that the calculated F-value (2.776) is less than the critical value (3.026) at the 5% level of significance. Hence, the result is not statistically significant.

Since the ANOVA result is not significant, the null hypothesis is accepted. This indicates that there is no significant difference in digital note-taking scores among students based on the Stream of study.

Ho2 .There is no significant difference in the mean scores of Digital Note-taking among Students based on age groups

Table: 4.16

Descriptive Statistics of Digital note-taking mean scores based on Age Groups

Age group	**Digital note-taking scores**		
	Mean	**S.D**	**N**
18-22 years	123.44	9.62	259
23-27 years	126.77	12.79	35
above 28 years	129.33	11.22	6
Total	**123.95**	**10.11**	**300**

The descriptive statistics Table: 4.15 presents the digital note-taking (DNT) scores across different age groups. Respondents in the above 28 years category have the highest mean score (Mean = 129.33, SD = 11.22), followed by those in the 23–27 years group (Mean = 126.77, SD =

12.79), and the 18–22 years group (Mean = 123.44, SD = 9.62) have lowest mean score. The overall mean score is 123.95 with a standard deviation of 10.11. The descriptive table shows there are differences in mean scores and SDs among the groups.

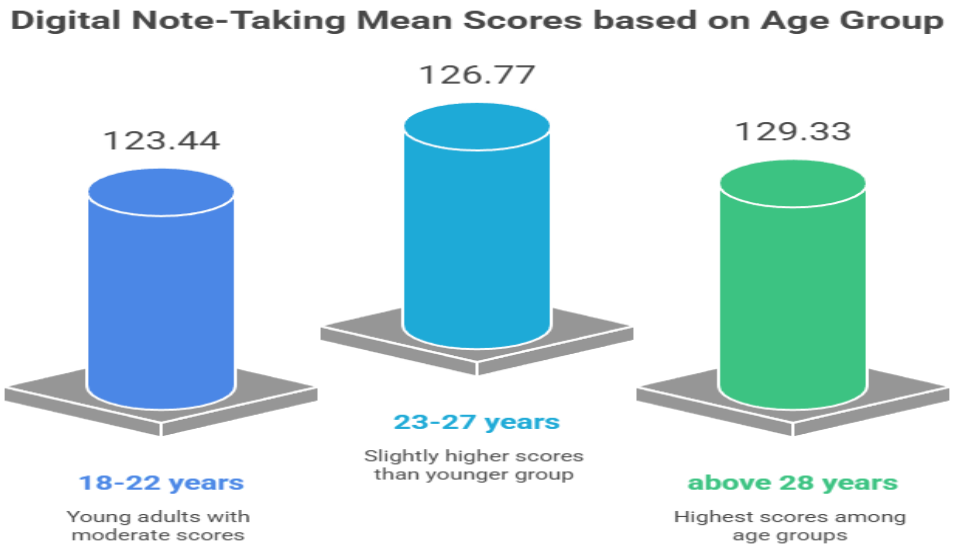

Fig. 4.13 Digital Note-TAking Scores based on Age Groups

In order to find whether the differences between the groups are statistically significant, the following hypothesis was framed and tested

Ho2: There is no significant difference in the mean scores of digital note-taking among Students based on age groups.

Table: 4.17

ANOVA of Digital note-taking scores based on age groups

	Sum of Squares	**Df**	**Mean Square**	**F**	**Sig.**
Between Groups	518.807	2	259.404	2.564	Ns
Within Groups	30051.443	297	101.183		
Total	**30570.250**	**299**			

Critical value: 3.026,NS – Not significant

The ANOVA results of Table:4.16 indicate that the calculated F-value (2.564) is less than the critical value (3.026) at the 5% level of significance. Hence, the result is not statistically significant.

Since the ANOVA result shows no significance, the null hypothesis is accepted. This implies that there is no significant difference in digital note-taking scores among respondents belonging to different age groups.

Ho3 .There is no significant difference in the mean scores of Digital Note-taking among Students based on the Year of study

Table:4.18

Descriptive Statistics of Digital note-taking scores based on the Year of study

Year of study	Digital note-taking score		
	Mean	**S.D**	**N**
First year	124.31	11.35	140
Second year	123.86	9.36	121
Third year	122.92	7.42	39
total	**123.95**	**10.11**	**300**

The descriptive statistics table:4.17 shows the digital note-taking (DNT) scores of Students across different years of study. Students in the first year have the highest mean score (Mean = 124.31, SD = 11.35), followed by second year students (Mean = 123.86, SD = 9.36), and third year students (Mean = 122.92, SD = 7.42) with comparatively lowest mean score. The overall mean score is 123.95 with a standard deviation of 10.11. The differences in mean scores across the years of study are very minimal, indicating a similar level of digital note-taking among students irrespective of their year.

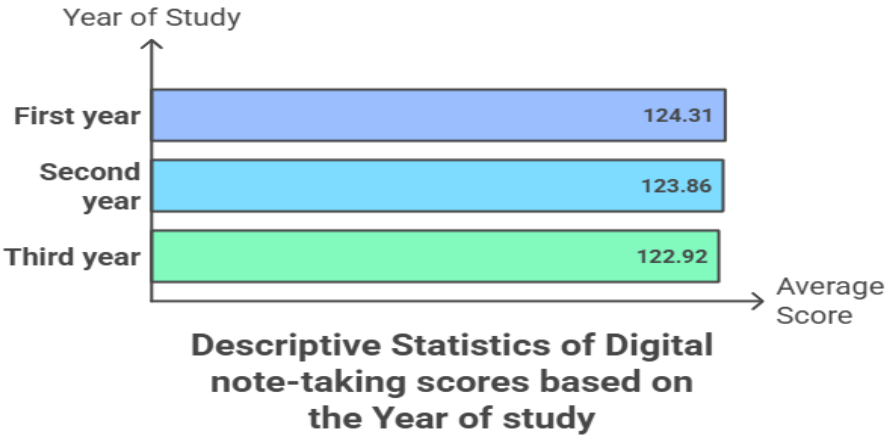

Fig. 4.14 Digital note-taking scores based on the Year of study

In order to find whether the differences between the groups are statistically significant, the following hypothesis was framed and tested:

Ho_3: There is no significant difference in mean scores of digital note-taking among year of study.

Table:4.19

ANOVA of Digital note-taking scores based on the Year of study

	Sum of Squares	**Df**	**Mean Square**	**F**	**Sig.**
Between Groups	60.698	2	30.349	.295	NS
Within Groups	30509.552	297	102.726		
Total	**30570.250**	**299**			

Critical value: 3.026, NS – Not significant

The ANOVA results reveal that the calculated F-value (0.295) is less than the critical value (3.026) at the 5% level of significance. Hence, the result is not statistically significant.

Since the ANOVA result shows no significance, the null hypothesis is accepted. This indicates that there is no significant difference in digital note-taking scores among students belonging to different years of study.

Ho4. There is no significant difference in the mean scores of Digital Note-taking among Students based on Area of locality

Table: 4.20

Descriptive Statistics of Digital note-taking scores based on Area of locality

Area of locality	**Digital note-taking scores**		
	Mean	**S.D**	**N**
Rural/village	123.40	9.32	142
Urban	124.44	10.78	158
Total	**123.95**	**10.11**	**300**

The descriptive statistics Table :4.19 present the digital note-taking (DNT) scores based on the area of locality. Respondents from urban areas have a slightly higher mean score (Mean = 124.44, SD = 10.78) compared to those from rural/village areas (Mean = 123.40, SD = 9.32). The overall mean score is 123.95 with a standard deviation of 10.11. The difference in mean

scores between the two groups is minimal, indicating marginal difference in levels of digital note-taking scores between Rural and Urban respondents.

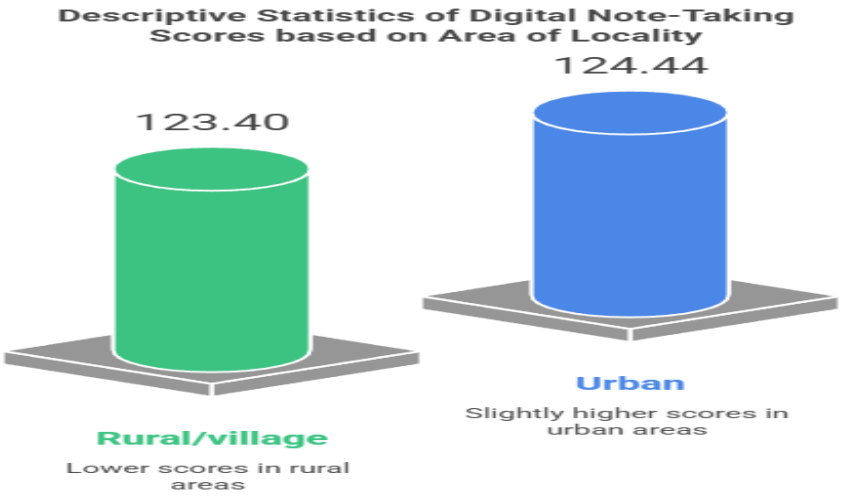

Fig. 4.15 Digital note-taking scores based on Area of locality

In order to find whether the difference between the groups is statistically significant, the following hypothesis was framed and tested:

Ho_4: There is no significant difference in the mean scores of digital note-taking among Students area of locality.

Table:4.21

Comparison of Digital Note-taking t-test result based on Area of Locality

't' value	**df**	**Sig.**
0.891	298	Ns

Critical value: 1.968, Ns – Not significant

The t-test results of Table:4.20 show that the calculated t-value (0.891) is less than the critical value (1.968) at the 5% level of significance. Hence, the result is not statistically significant.

Since the result is not significant, the null hypothesis is accepted. This indicates that there is no significant difference in digital note-taking scores between respondents from rural/village and urban areas.

Ho5 .There is no significant difference in the mean scores of Digital Note-taking among Students based on Socio-economic status

Table: 4.22

Descriptive Statistics of Digital note-taking scores based on Socio-Economic Status of Students

Socio-economic status (Income Per Month)	**Digital note-taking scores**		
	Mean	**S.D**	**N**
below Rs.25000	123.53	9.76	143
Rs.25000-Rs.50000	123.35	10.35	120
Rs.50000 and above	127.51	10.22	37
Total	**123.95**	**10.11**	**300**

The descriptive statistics Table: 4.23 present the digital note-taking (DNT) scores across different socio-economic status (SES) groups. Respondents belonging to the ₹50,000 and above income group have the highest mean score (Mean = 127.51, SD = 10.22), followed by those in the below ₹25,000 group (Mean = 123.53, SD = 9.76) and the ₹25,000–₹50,000 group (Mean = 123.35, SD = 10.35). The overall mean score is 123.95 with a standard deviation of 10.11. The higher income group shows a higher mean score, while the other two groups show more or less same level of scores

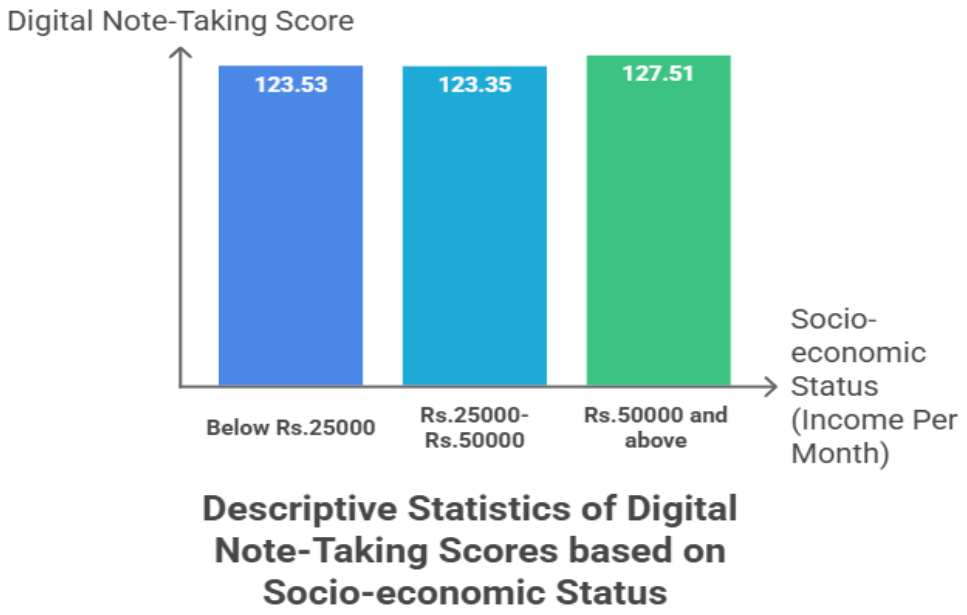

Fig. 4.16 Digital note-taking scores based on Socio-Economic Status

In order to find whether the differences between the groups are statistically significant, the following hypothesis was framed and tested:

Ho_5: There is no significant difference in mean scores of digital note-taking among socio-economic status.

Table: 4.23

ANOVA of Digital note-taking scores of Students based on Socio-economic Status

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	538.098	2	269.049	2.661	Ns
Within Groups	30032.152	297	101.118		
Total	**30570.250**	**299**			

Critical value: 3.026, Ns – Not significant

The ANOVA results of Table: 4.23 indicate that the calculated F-value (2.661) is less than the critical value (3.026) at the 5% level of significance. Hence, the result is not statistically significant.

Since the ANOVA result shows no significance, the null hypothesis is accepted. This implies that there is no significant difference in digital note-taking scores among respondents belonging to different socio-economic status groups.

CONCLUSION

After analyzing the data collected from the survey, it was found that college students in Coimbatore District have average knowledge about digital note-taking. Most of the students are beginners; therefore, they have low efficiency even when they know how to use digital devices. Smartphone usage is the highest, while students are using both techniques to create notes.

From the result of hypothesis testing, there are no significant differences in digital note-taking awareness according to different majors, age groups, year of studies, place of living, and socio-economic background. Therefore, it can be said that all students have almost similar digital awareness.

In conclusion, the above research findings can be useful for institutions to improve the digital skills of students.

CHAPTER-05

SUMMARY AND FINDINGS

CHAPTER V
SUMMARY AND FINDINGS

5.1 INTRODUCTION

The chapter provides an extensive summary of the research conducted on the topic "Awareness about Digital Note-taking amongst college students in Coimbatore district." The chapter includes various findings which have been deduced from the data analysis and interpretation. Moreover, educational implications, limitations and future scope of research are also provided along with the discussion of findings.

5.2 SUMMARY OF THE STUDY

The current study sought to investigate the awareness level of digital note taking by college students in the Coimbatore district. Descriptive survey research design was used in the study. The sample included 300 college students drawn from Arts & Science, Engineering, and Education disciplines. Information was obtained through the use of a questionnaire. Various statistical tools like mean, standard deviation, t-test, and ANOVA were employed in analyzing the data collected. The study sought to look at the differences that exist in awareness levels of digital note taking in relation to various demographic factors.

5.3 MAJOR FINDINGS OF THE STUDY

Demographic Findings

Findings from the demographic study indicated that there was an even distribution among the three disciplines. Respondents were all females enrolled in the university. The most dominant age range for the respondents was between 18 and 22 years old. First-year students dominated the respondents, and slightly more students came from urban backgrounds. In terms of socio-economic status, many students came from poor or middle classes.

Digital Note-taking Awareness Findings

The findings reveal that most students have at least a fundamental understanding of the software used for taking notes digitally. Over half the participants were novices, with many more having a good understanding of the concept. Fewer students were proficient in the use of the tool. The smartphone was found to be the most frequently used device for taking notes.

Hypothesis-wise Findings

Analysis of the hypotheses indicated that there is no significant difference in the performance of digital note taking among college students with regard to the kind of major, age, year of study, area of locality, and socio-economic status. Despite the minor differences in mean scores such as higher scores among the students from the Education field, higher ages, first-year students, urban participants, and socio-economically better off groups, none of the differences was statistically significant using the 5% level of significance. The F-values of 2.776, 2.564, 0.295, and 2.661 for the Stream of study, age, year of study, and socio-economic status respectively, as well as the t-value of 0.891 for locality, all turned out to be lower than the critical values. Hence the result reveals no significant difference in the digital Note-taking scores based on the demographic variables namely,Stream of study, age, year of study, and socio-economic status.

The analysis reveals that the majority of college students (72.67%) fall under the average level of digital note-taking, indicating a moderate level of awareness and usage. A smaller proportion (16.67%) of students demonstrate a high level of digital note-taking skills, while only 10.66% fall into the low category. This suggests that although most students possess a basic understanding of digital note-taking, there is scope for improvement to elevate more students to a higher level of proficiency.

5.4 FINDINGS DISCUSSION

From the results obtained from the study, it can be observed that there is an average level of awareness of digital note taking among college students irrespective of the demographics taken into consideration. This could indicate that digital technology is available to everyone without any discrimination due to education, locality, or social status. Nevertheless, the overwhelming number of beginners highlights the need for further education in this area.

5.5 EDUCATIONAL IMPLICATIONS

The above-mentioned research emphasizes the significance of incorporating digital technology in higher education. Educators need to motivate their students to use digital note-taking software for the effective acquisition of knowledge. Training should be provided to students for improving their digital competence.

5.6 SUGGESTIONS / RECOMMENDATIONS

On the basis of the results obtained, it is recommended that universities conduct workshops and training programs to help students develop digital note-taking skills. They should be motivated to

adopt digital technologies in their academic life. Availability of the necessary devices and internet facilities can further promote digital learning techniques.

5.7 LIMITATIONS OF THE STUDY

This research was confined to one geographical location, and only women participated in the survey. The inclusion of self-reporting data could lead to bias. These results might not apply to other groups of people.

5.8 SUGGESTIONS FOR FURTHER RESEARCH

Future research can include an experiment using a bigger sample that consists of different individuals in both genders. Comparative research across different locations like districts or states can yield valuable information as well. Experimentation can help researchers determine how effective digital notes-taking is regarding improving academic performance.

5.9 CONCLUSION

Based on the findings of the study, it is safe to conclude that the college-going students in Coimbatore District have medium awareness about digital notetaking. Inconsistency across all the demographic criteria suggests equal access to technology by the participants of the research. At the same time, domination of beginners calls for training programs aimed at improving their digital skills.

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APPENDICES

APPENDICES

Questionnaire

Awareness of Digital Note-Taking among College Students

Personal Data Sheet

Section-A

Institution name:

Type of Major(Stream of study) : ☐Arts & Science ☐ Engineering ☐ Education

Specified major:

Gender : Female

Age group :☐18-22 ☐23-27 ☐Above 28

Year of study : ☐ First year ☐Second year ☐Third year

Area of locality : ☐Rural/village ☐Urban

Parental occupation

1. Father's occupation :☐Business ☐Government job ☐Private job ☐Daily wages ☐Agriculture ☐Not Employed

2. Mother's occupation:☐Business ☐Government job ☐Private job ☐Daily wages ☐Agriculture ☐Not Employed

3. Socio-economic status(Per Month):☐below 25000 ☐ 25000-50000 ☐50000 and above

Section-B

1.Digital Tool Preferences

B 1.1. Familiarity with digital tools for the Note-Taking app :

☐Beginner ☐Intermediate ☐Advanced

B 1.2. Frequency of digital device usage for academic purpose:

☐Daily ☐A few times a week ☐Occasionally ☐Rarely ☐Never

B 1.3. Devices used for note-taking:

☐Laptop ☐Tablet ☐Smartphone ☐Computer ☐Digital writing pad ☐None

B 1.4. Preferred Note-Taking Method:

☐Digital (using apps or software) ☐Traditional (pen and paper) ☐Mixed (both digital and traditional)

Please indicate the extent to which you agree or disagree with the following statements:

Strongly Agree-(SA) Agree-(A) Neutral-(N) Disagree-(D) Strongly Disagree-(SD)

Section 01: Awareness and Knowledge of Digital Note-Taking

S.No	Statement	SA	A	N	D	SD
1.	I am aware of various digital note-taking apps like OneNote, Evernote, etc..					
2.	I am familiar with the use of styluses or digital pens for handwritten digital notes.					
3.	I think digital note-taking is only useful for technical ,fields, not for general education.					
4.	I find complications in understanding digital note-taking tools.					
5.	I am aware that digital note-taking allows cloud synchronization for easy access.					
6.	I believe digital note-taking doesn't offer any specific benefits over paper notes.					
7.	I understand the basic features of digital note-taking tools.					
8.	I understand that digital note-taking helps in organizing study materials efficiently.					
9.	I have never heard of digital note-taking tools before.					
10.	I believe digital note-taking is unnecessary for my academic work.					

Section 02: Usage and Preferences of Digital Note-taking

11.	I feel that digital note-taking does not improve my study habits.					
12.	I use digital note-taking easily to store, retrieve and work on my notes.					

13.	I avoid digital note-taking because I find handwritten notes more effective.					
14.	I use digital note-taking tools to methodize my study materials.					
15.	I prefer digital note-taking for easy editing,storing and retrieving notes efficiently.					
16.	I struggle to maintain consistency in using digital note-taking tools.					
17.	I often forget to use digital note-taking tools and rely on traditional notebooks.					
18.	I find typing notes digitally distracting during lectures.					
19.	I use digital note-taking for both academic and personal purposes.					
20.	I frequently use digital note-taking tools for academic purposes.					

Section 03: Accessibility,Collaboration and Institutional Support.

21.	I keep my digital notes safe and accessible from any device using cloud storage.					
22.	I struggle to share my digital notes with people who don't use the same applications.					
23.	I do not receive enough training or support from my institution for digital note-taking.					
24.	I feel uncomfortable using digital note-taking because proper guidance wasn't given.					
25.	I can easily share my digital notes with classmates.					
26.	I worry about losing my notes if my device malfunctions or my account is hacked.					

27.	I am encouraged by my institution to use digital note-taking in academic settings.					
28.	I often collaborate with peers using digital note-taking apps for group projects.					
29.	I would attend workshops or training sessions to improve my digital note-taking skills.					
30.	I feel that digital note-sharing is inconvenient and unreliable.					

Section 04: Attitude, Future Intentions and Health Issues.

31.	I use digital note-taking as an eco-friendly alternative to paper notes.					
32.	I believe traditional note-taking methods are superior to digital note-taking.					
33.	I believe digital note-taking will play a key role in the future of education.					
34.	I plan to increase my usage of digital note-taking tools in the future.					
35.	I don't need to carry heavy books and notebooks because of digital note-taking.					
36.	I experience eye strain and discomfort due to prolonged use of digital note-taking.					
37.	I am hesitant to rely entirely on digital note-taking due to potential technical issues.					
38.	I do not engage myself in adopting digital note-taking anytime.					
39.	I am willing to explore and learn more about digital note-taking tools.					
40.	I prefer paper notes because it feels more personal and engaging.					

ETHICAL FORM

Avinashilingam Institute for Home Science and Higher Education for Women
Deemed-to-be-University Estd. u/s 3 of UGC Act 1956, Category A by MHRD (now MoE)
Re-accredited with 'A++' Grade by NAAC CGPA 3.65/4, Category I by UGC
Coimbatore-641 043, Tamil Nadu, India

Institutional Human Ethics Committee (IHEC)

Date 4/3/2026

To
Reethiga K
24PED010
Department of Education
Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore 641043

Dear Ms Reethiga K
Ref: Your application IHEC 2026/EDN6
Awareness of Digital Note-taking among College Students in Coimbatore District submitted for approval of IHEC

The Institutional Human Ethics Committee of Avinashilingam Institute for Home Science and Higher Education for Women after careful scrutiny and review of your application, hereby grants approval to your application titled 'Awareness of Digital Note-taking among College Students in Coimbatore District '. The approval number for the same is IHEC 2026/EDN6/ XMT
This certificate is issued for the study period specified in your application.

Best Wishes,

Dr. Shubashini K. Sripathi
Member Secretary