OPEN ACCESS

Volume: 13

Special Issue: 1

Month: March

Year: 2026

P-ISSN: 2321-4643

E-ISSN: 2581-9402

Citation:
Subbu Arravind, M., and Reena Raj. "Digital Note-Taking in Higher Education: A Thematic Analysis of Student Adoption, Benefits, and Learning Outcomes." *Shanlax International Journal of Management,* vol. 13, no. S1, 2026, pp. 177–85.

DOI:
https://doi.org/10.34293/management.v13iS1-Mar.10763

Digital Note-Taking in Higher Education: A Thematic Analysis of Student Adoption, Benefits, and Learning Outcomes

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Abstract

Digital technologies have changed the way of teaching and learning in higher education institutions. In modern learning environments, learners increasingly use digital devices, including laptops, tablets, and smartphones, for their learning activities. In traditional learning environments, learners have used handwritten notes for writing down what they have learned in class and for summarizing key concepts. However, the growth of computer technology and internet -based learning platforms has encouraged students to adopt digital note-taking tools for organizing and managing academic information which help students store, organize, and retrieve academic information more efficiently in a productive manner. Multimedia, storage, and search, along with collaborative editing, are some other features of digital note-taking applications that could also add value to the learning experience. Despite the increased rate of using digital tools of taking notes, the issue of whether these tools could add value to the learning experiences of students is still a matter of debate among educators and researchers. Some researchers argue that digital note-taking tools improve accessibility, productivity, and collaboration among students. Other problems that were identified in other studies include digital distraction, reduced processes of cognitive information, and addiction to technology. As a result, the overall impact of the digital note taking practices of the higher education settings needs to be examined.

This study will discuss the use, benefits, and problems associated with the use of digital note taking tools in tertiary institutions. The research adheres to a qualitative research design and uses thematic analysis to put together findings of the existent academic literature on the subject of digital learning tools and note taking patterns. None of them were older than 2019 or later than 2025, and academic articles that were published during this period were analyzed to identify widespread patterns and themes that were relevant to the use of technology, learning outcomes, and implications of education.

As the result of the conducted analysis, the five major themes were defined such as the switching between the traditional handwritten notes and the digital note-taking technology, the problems that affect the use of digital technologies by students, the educational worth of utilizing digital note- taking technology, the barriers and limitations of the use of digital technologies in the learning process, and the future implications of digital note-taking to the higher education institutions.

The findings have revealed that digital note taking technologies possess a number of advantages including improved organization of academic knowledge, more convenient access to learning resources as well as enhanced collaboration among

students. However, distractions on the Internet, cognitive overload, and disparities in access to the technology-related resources may be the factors that diminish the usefulness of these tools. The survey finds that a moderate approach that is achieved through adopting both the digital and traditional approach to taking notes may be the most beneficial way to provide the maximum learning to students in modern educational establishment.

Keywords: Digital Note-taking, Educational Technology, Higher Education, Technology Adoption, Student Learning, Thematic Analysis.

Introduction

Digital technologies have been integrated in higher education institutions and have helped a great deal to transform how students learn, interact and handle information in academics. Colleges across the globe are implementing technology, web-based education, and computer-based material to enhance teaching and learning processes. Through these technological advancements we have seen that there are more opportunities available to students to learn, interact with other students and organize their academic tasks in a more organized manner. Note-taking is one of the most significant learning processes in higher education. Note-taking helps students record important lecture points, organize information, and review key academic concepts. Historically, students used notebooks and other paper materials in order to take handwritten notes. It is a well-known learning strategy, which has been found to be useful in teaching and learning processes as it involves active processing of information by a student during the process of taking notes by hand. Lecture summary is a more challenging type of mental processing and this enhances understanding and retention of knowledge when the students summarize the lecture in their own words. Nevertheless, unconventional ways of taking notes are also limited. Written notes may be hard to organize and access particularly when students are dealing with multiple courses and vast information. Furthermore, with handwritten notes, students have no opportunity to use multimedia components, including pictures, audio messages, and links, which are becoming more common in the contemporary learning environment. Development of digital technologies has brought new tools which enable the students to capture and organize the information in a more efficient manner. Digital note taking programs allow students to make organized notes, save them in electronic format and access them on other devices. Other features that are offered by these tools include search capabilities, tagging, and cloud synchronization which enhance the organization and accessibility of scholarly materials. The use of digital note-taking tools has been growing considerably as the online learning platforms and hybrid learning environments grow. Laptops, tablets and smartphones are now used by students to take lecture notes, course materials and cooperate with others. The changes have revolutionized the traditional way of taking notes and provided new opportunities to improve the learning activities. Irrespective of these benefits, scholars have expressed a concern regarding the effects of digital note-taking on academic performance. Certain researchers indicate that taking notes using a high typing speed can lower the thinking ability since students can put down the data without summarizing them. Moreover, digital devices can cause distractions in the form of notifications in social media and other online activities. Therefore, an important question arises regarding the effectiveness of digital note-taking tools in higher education. The proposed study seeks to discuss the digital note-taking behaviors through thematic analysis of available literature to determine prominent trends, advantages, difficulties, and other implications to modern educational settings. Although many studies have explored the use of digital technologies in higher education, limited research has focused specifically on digital note-taking practices using a thematic synthesis of recent academic literature. Most of the previous studies have focused on the comparison of the effectiveness of hand-written notes and typed notes, or the comparison of the effectiveness of a particular digital tool used in the classroom. However, there is a lack of research that examines the general patterns relating to the use and effect of digital note-taking technologies

in various educational settings. Additionally, the research methods applied are mostly quantitative experiments or surveys that assess the performance of the students in a controlled environment. However, the methods applied might not show the general trends, as the result is a culmination of various research studies.. A qualitative synthesis of the available literature could give a better understanding of the impact of digital note-taking technology on learning.

This study aims to fill this gap by conducting a thematic analysis of the recent scholarly literature available on the subject of digital note-taking in higher learning. This would give a better understanding of the benefits and drawbacks of using digital note-taking technology.

Research Gap

Although there is an increasing amount of research on the application of digital technologies in higher education, there is rather little research on digital note-taking practice that is conducted through the integration of the existing body of research. A significant part of the past study has focused mostly on the comparison of handwritten and typed note taking or the effectiveness of specific digital tools in classrooms. Nevertheless, the existing studies are not conducted to explore general trends in the use and the effects of digital note-taking technologies in various higher education settings. Moreover, most previous research uses primarily the quantitative approach (controlled experiments or survey) to assess the performance of the students. Although these strategies can be helpful in delivering valuable information, they might not be able to deliver the overall pattern and themes that are developed through numerous researches in this area. This means that a qualitative thematic synthesis of the studies that are available can provide a more detailed understanding of the advantages, problems, and learning issues associated with digital note-taking technologies. The purpose of the study is to address the aforementioned gap by conducting a thematic analysis of the latest academic literature on the concept of digital note-taking in higher education. This study can provide more insight into the impact of digital note-taking technologies on learning and academic achievements by identifying the themes and patterns associated with several studies .The above are specific goals, and they include:

1. To investigate the change in the practice of taking notes by hand to digital note taking.
2. To identify the factors that influence the process of adopting digital note taking technologies by the students.
3. To investigate the pedagogical values of digital note taking tools.
4. To analyze the issues associated with digital note taking technologies.
5. To identify the implications of digital note taking in higher learning institutions in the future

Review of Literature

Development of the Note-taking in Higher Education

It has been widely known that note-taking is a necessary academic skill that facilitates student learning, understanding, and memory. In the past, students used to use handwritten notes in lectures to summarize the main ideas and structure academic information. Studies have continuously indicated that the active aspect of learning, which is facilitated by the use of handwritten notes, encourages students to process information, synthesize and the cognitive aspect of learning which deals with lecture material (Mueller and Oppenheimer, 2014; Piolat, Olive and Kellogg, 2005). As the aspect of higher education continues to become more digitalized, there has been a progressive change of note taking practices on paper to a digital format. Availability of laptops, tablets and smartphones has made students to be able to capture, store and organize lecture content in electronic format. Stacy and Cain (2015) claim that the digital technologies have revolutionized the process of taking notes during the academic work of students considerably, as it allows them to access and process the learning materials more effectively.

Digital Note-Taking Technology

Digital note-taking is a process that involves the use of technologies and applications to document, store, and organize scholarly data. Evernote, OneNote, and Notion are modern apps enabling students to make structured notes, which contain text, images, recordings, and hyperlinks. These applications facilitate multimedia learning systems and offer a versatile choice of structuring the learning material. Scholars emphasize that digital note-taking tools complement learning because they allow having access to academic materials easily, storing, retrieving, and sharing the m (Demirelli et al., 2023. It also allows students to synchronize their notes and place them in different devices, thus ensuring that students are able to access their learning materials. Collaborative learning can also be enhanced by the use of cloud storage, as students can share their notes with each other and collaborate to ensure that they are able to complete their academic assignments. Another feature that can be attributed to digital note-taking systems is that they are able to provide advanced search, tagging, and organization. These features are important in ensuring that students are able to access their academic information in a timely fashion.. With the increasing trend in the use of digital learning platforms in the higher education institutions, the utilization of digital note taking tools among the university students has continued to increase.

Technology Adoption in the Education World

The technology acceptance theories can be used to explain the adoption of digital note-taking technologies in higher education. The Technology Acceptance Model (TAM) that was created by Davis (1989) is one of the most common used frameworks. TAM believes that there are two variables of importance in the choice of technological tools, perceived usefulness and ease of use. Students who consider digital note taking tools to be useful in enhancing academic productivity and academic performance tend to embrace it in their everyday learning activities. In the same manner, applications that are simple to navigate and are easily incorporated in the current learning systems will have greater adoption rates among learners. The Unified Theory of Acceptance and Use of Technology (UTAUT) is another theory that has commonly been used in studies related to educational technology. Some of the factors identified in this model include performance expectancy, effort expectancy, social influence, and facilitating conditions, as one of the determinants of technology adoption (Venkatesh et al., 2003).

Research in the field of higher education suggests that the intention of students to use digital note- taking tools depends on the institutional support, the usage by peers, and the perceived academic advantages.

Advantages of Taking Notes Digitally

Digital note-taking technologies have a number of benefits that make higher learning experiences enhanced. Among the main advantages, there is a better organization of academic materials. Digital tools enable students to organize notes by folders, tags and keywords which makes it easier to retrieve a particular information when examining. Accessibility and portability is another valuable advantage. The use of digital notes makes it possible to access the mat erial of lectures using multiple devices, which helps students to review the lecture content wherever they are. Cloud computing systems also allow automatic backup and syncing of notes, which minimizes data loss. Multimedia integration is also made easy through the use of digital note taking tools, and this has a positive impact on the learning process. This is because the students are able to incorporate schemas, screenshots, audio tapes, and video links into their note taking. This is a multimodal approach, which caters for the different learning styles and ensures comprehension of the complex concepts.. Moreover, the digital tools will support collaborative learning since students can share

notes with other students, engage in group discussions, and collaboratively edit documents. Studies indicate that cooperative note-taking has the potential to enhance the sharing of knowledge and an increased interest in course material.

Learning and Cognitive Processing Outcomes

Although there are a number of benefits associated with digital note-taking, scholars have also studied its effect on cognitive processing as well as the learning outcomes. According to some studies it has been indicated that typing notes on laptops enables the students to record more information during lectures than the handwritten notes. But this accelerated speed can also lead to verbatim transcription where students do not process the information that they are recording. Mueller and Oppenheimer state that handwritten note-taking usually stimulates the students to summarize and paraphrase the information of the lectures that improves the conceptual knowledge and long-term memorization (Mueller and Oppenheimer, 2014). Conversely, digital note taking can diminish the cognitive processes when the students are typing without processing the information. Notwithstanding these issues, other researches have shown that digital tools are able to improve learning outcome when they are implemented well. Digital platforms could be enhanced with structured systems of taking notes, including the Cornell note-taking system, to promote active learning and knowledge organization.

Problems and Drawbacks of Digital Note Taking

Digital note taking, in spite of its advantages, also has a number of challenges in the higher education setting. Digital distraction is one of the biggest problems. The students using laptops or smartphones during the lecture may be distracted by social networks or chat programs, as well as irrelevant activities on the internet. This may cause distraction, which is harmful to concentration and schoolwork. Technology dependency is also another problem in which the students are so used to the technology that they may face difficulty in the traditional learning process. Moreover, the lack of access to technology may create differences between the students, especially in the schools where not all the students may have access to high-tech devices and the internet connection. Another problem that has been highlighted by the researchers is the problem of information overload. The use of technology helps the students to access a large amount of information, which may cause the problem in the arrangement and revision of the study material.

Research Methodology

This research will employ a qualitative research method in the assessment of the adoption of digital note-taking and its effect on higher education students because the research seeks to find out the effect of digital note-taking on higher education students. The research method will use thematic analysis to reveal the patterns and significant themes that emerge from the data collected about digital note-taking. The research data will be collected from secondary data sources, including published journal articles, research papers, and other academic sources on the use of digital learning technologies. These sources are published as late as 2019 and 2025. This study has conducted the review of approximately 25 peer-reviewed journal articles. The relevant literature was reviewed thoroughly to establish common themes and trends in the use of digital note taking tools in learning environment. The results were then structured into thematic areas to have a better insight into whether digital note-taking has a purpose in improving student learning and academic engagement.

The thematic analysis employed for the study consisted of the following stages

1. Familiarization with the data
2. Generating initial codes
3. Searching for themes
4. Reviewing themes
5. Defining and naming themes
6. Producing the final report

This systematic approach has helped the researcher to identify the recurring patterns with regards to digital note-taking practices in higher education.

Data Analysis

The thematic analysis has revealed five major themes with regards to digital note-taking

Practices

Theme 1: Transition from Traditional to Digital Note-Taking

The results of the thematic analysis revealed that the educational environment is gradually shifting towards digital note-taking tools instead of traditional handwritten notes. This is due to the increasing number of digital devices and online learning tools.

Students prefer digital note-taking tools because it allows them to record the information quickly and efficiently.

Theme 2: Technology Adoption Factors

There are several factors that affect the adoption of digital note-taking tools by the students. Perceived usefulness and ease of use are the most important factors in the adoption of technology. If the students perceive that the digital tools will help them to achieve their academic goals, they will adopt the digital tools.

Social factors also play a vital role in the adoption of digital tools. Students may adopt the digital tools if their peers or teachers suggest the tools.

Theme 3: Benefits of Digital Note-Taking

There are many benefits associated with the use of digital note-taking technologies in education. These include better organization of learning resources, better access to learning information, and better collaboration between students.

The students are able to save more information in the form of notes and retrieve information faster with the help of the search option.

Theme 4: Challenges of Digital Note-Taking

Although digital note-taking technology has various benefits, it also comes with various challenges.

One of the challenges that are associated with the use of digital note-taking technology is digital distraction. This challenge was cited in the literature as one of the common problems that affect students who use digital technology in their learning. This challenge occurs in classrooms, where students are able to use digital technology to write their notes. They may become distracted by social media and other activities that are being done online.

Technological dependency is another challenge associated with the use of digital technologies in learning. This challenge arises because students depend more on technology in their learning, and problems arise if technology is unavailable

Theme 5: Future Educational Implications

Digital note-taking technologies will continue to influence the future of higher education. As digital learning environments expand, institutions must ensure that students have access to appropriate technological infrastructure and training.

Results and Findings

The thematic analysis performed within the frames of the current study provided potentially significant evidence on the implementation and the effects of the digital note-taking technologies in higher education. In the study, the researcher reviewed recent scholarly works published in the period between 2019 and 2025, which enabled the researcher to identify the patterns of using digital tools to take notes, the advantages of using digital tools, and the challenges related to their use. The findings also bring to the fore the changing nature of the digital learning environments to influence the contemporary academic practices. Among the major conclusions of the research is the increasing shift of the traditional handwritten way of taking notes to the digital way of note-taking. The use of laptops, tablets, and smartphones to take lecture notes and handle academic information by many students is on the rise. The trend has been necessitated to a large extent by the growing accessibility to digital devices and the introduction of online learning platforms in universities. Digital learning tools such as learning management systems, recorded lectures, and digital course materials encourage students to adopt electronic tools for managing and storing academic information. The other important finding is related to factors which impact the usage of digital technologies in note-taking among students. According to the analysis, it has been revealed that perceived usefulness and ease of use have a great impact on technology adoption. If students feel that they will be able to work more efficiently on their academic tasks by means of digital note-taking technologies and will be able to get positive learning outcomes, they will be more likely to adopt digital technologies for note-taking. Apart from that, institutional support and peer influence have been revealed to be quite impactful factors which can be used to increase the usage of digital learning technologies. Students will be more likely to adopt digital note-taking technologies if lecturers permit them to do so. According to the findings, digit al note-taking technologies have been revealed to provide various academic benefits to students which can increase their learning processes. Among the major benefits, it has been revealed digital note- taking technologies can improve the organization of academic materials among students. Digital note-taking technologies provide students with the opportunity to systematize their notes by creating folders and marking important topics information very easily with search features. This kind of organization is very useful, especially when the students need to revise a lot of information when they are taking their examinations or when they are doing their academic work. Besides the organization, the aspect of accessibility is the other significant advantage that has been noted during the analysis. The online notes can be kept through the cloud storage system, which means that the students will have the ability to access their notes from anywhere and at the same time through multiple devices. This is flexible enough to support the learning styles of the contemporary world, where the students will often have the opportunity to experience remote learning, Internet discussions, and collaborative academic work. The cloud storage system also reduces the probability of losing academic information, which is likely to happen when the students make use of their traditional written notebooks. During the analysis, it is also noted that the technology of taking online notes has the potential for collaboration among the students. There are many online tools that support the sharing of the notes between the students and the collaborative creation of the learning content. This is a collaborative feature that aids in active learning and sharing of knowledge among the students. Jotting down notes may also

assist students in explaining difficult ideas through grouping and discussing information. Although these are the advantages, the evidence also shows that there are a number of challenges coming with digital note-taking technologies. Digital distraction is one of the most frequent problems that are mentioned in the literature. Students who bring laptops or smartphones to the lecture rooms are likely to be tempted to visit social media, messaging apps, or irrelevant websites. Such distractions may decrease the level of concentration and have an adverse learning outcome. Less cognitive processing during note-taking is another challenge that was found in literature. Other researchers indicate that fast typing of notes could encourage students to copy information as they are instead of paraphrasing it. This can lead to less cognitive processing on the lecture material by students and hence decreased understanding and long-term memory storage. By comparison, note-taking by hand usually involves interpretation and summarization of information on the part of the students and thus, more in-depth learning. The results also show that digital note-taking can be influenced by technological addiction and inequitable access to digital resources. Not every student will be able to use laptops, tablets, or good internet connections. Digital learning tools can be restricted in use by students because of the poor technological infrastructure in certain learning settings. The process of capturing notes can also be disrupted by technical issues like malfunctioning of the devices, software crashes or the loss of connection. Additionally, the findings indicate that the students tend to use the hybrid method of taking notes including digital and traditional means of taking notes based on the condition of learning. As an example, the students will be able to organize the lecture slides and academic readings with the help of digital tools and summarize the essential concepts with handwritten notes and answer complex problems. With this hybrid approach, the students will have the benefits of the digital technology and, at the same time, the cognitive benefits of using handwritten notes. Overall, the findings of this research indicate the fact that digital technologies in the context of note-taking have become increasingly important in the contemporary learning setting in higher education institutions. Even though these digital tools have a high level of advantages, the success of these tools is largely dependent on the usage of these tools by the students and the support of the institutions.

The results indicate the importance of teaching the students about the successful future of using digital technologies in the context of note-taking with the aim of maximizing the profit and minimizing the distractions and cognitive disabilities.

Conclusion and Implications

Online note taking technologies are drastically changing the learning activities in universities. This research has shown that digital devices that include laptops, tablets, and smartphones are progressively being used by the students to obtain, arrange, and handle academic data. Digital note-taking tools have a number of benefits, such as a better structure of learning materials, quicker access to information, and more possibilities to collaborate with students. The thematic analysis also indicates that the use of digital note taking is affected by the perceived usefulness, ease of use, and the increased use of digital learning environment in universities. Nevertheless, the research also shows that there are a number of issues related to digital note-taking, such as digital distractibility, cognitive overload, and technology addiction. On the whole, the results indicate that digital note-taking technologies may be used to make learning experiences better provided that these technologies are applied in an adequate manner. This study has a number of significant implications for higher learning institutions, their teachers, and their students. To start with, universities need to invest in sound technological infrastructure that can support the practice

of digital learning. Secondly, the teacher ought to teach the students how to use digital note-taking devices. Thirdly, the online students ought to learn how to use digital note-taking methods as a way to improve interaction and cooperation in the classroom. Fourthly, universities ought to encourage a balanced mode of learning that encompasses a system that combines the digital and traditional modes of taking notes. Lastly, higher learning institutions ought to encourage the responsible use of digital technology in the classroom.