Chapter 2

REVIEW OF RELATED LITERATURE

This chapter presents a comprehensive review of the relevant literature and studies, drawing from both local and foreign sources. The included materials aim to familiarize readers with information directly relevant to the present study, providing a solid foundation for understanding the research context and its significance.

Foreign Literature

Transformation Or Evolution? Education 4.0, Teaching And Learning In The Digital Age

Bonfield et al. (2020) reviewed Education 4.0 in higher education, focusing on the role of digital personal assistants and online learning. Using literature review and scenario-planning methodology, the study examined case studies from institutions like the University of Bath, Nanyang Technological University, and Deakin University to explore opportunities and challenges in implementing digital innovations. The findings highlight significant implications for StudyBuddy, a collaborative study app, suggesting it can integrate features like personalized study reminders, content recommendations, and real-time collaboration tools. Aligning

with Education 4.0 principles, StudyBuddy aims to enhance academic achievement and digital competencies, supporting both emergency online teaching and strategic digital learning. By providing a personalized and engaging learning experience, StudyBuddy can empower students to become active participants in their education and develop essential digital skills. This aligns with the vision of Education 4.0, which emphasizes the importance of lifelong learning and digital fluency in the 21st century.

The Effects of Collaborative Note-Taking in Flipped Learning Contexts

The integration of collaborative note-taking in educational settings, particularly within e-learning environments, has garnered significant attention due to its potential benefits for student engagement and learning outcomes. Baldwin, Fanguy, and Costley (2019) explored the effects of collaborative note-taking in a flipped learning context, revealing that while shared note-taking can enhance comprehension by allowing students to divide the labor and focus on understanding during lectures, the quality of participation is crucial for improved performance. Their study found no significant differences in learning outcomes between collaborative and individual note-takers, suggesting

that active engagement in the note-taking process is essential. Furthermore, the dynamics within collaborative groups play a vital role, as some groups produced comprehensive notes while others lacked meaningful interaction, highlighting the need for educators to foster environments that encourage accountability and active participation among students (Baldwin et al., 2019). StudyBuddy addresses Baldwin, Fanguy, and Costley's (2019) findings by promoting collaboration and active participation, essential for improving learning outcomes. By integrating organizational tools and collaboration features, the app enhances note-taking efficiency and fosters meaningful interactions. Its marketplace functionality will also encourage resource sharing, boosting student engagement, productivity, and academic success.

Understanding the role of digital technologies in education: A review

According to Haleem et al. (2022) the pivotal role of digital technologies in education, emphasizing their significance in achieving the United Nations' sustainable development goal of quality education by 2030. The paper discussed how digital technologies have transformed education, especially during the COVID-19 pandemic, fostering a paradigm

shift in the system. The study highlighted the multifaceted roles of digital tools as knowledge providers, co-creators of information, mentors, and assessors, enhancing student engagement and interest in research. Utilizing a literature review methodology, the research analyzed various sources to explore the impact of digital technologies, including mobile learning apps, on language learning. Key themes included the importance of technology in education, benefits of integrating technology in classrooms, and the emergence of digital classrooms. The findings align with the objectives of StudyBuddy, a collaborative study and note-taking app, which supports technology-enabled collaborative learning environments through features like group discussions, shared note-taking, and collaborative projects. This alignment suggests that StudyBuddy can effectively enhance education by providing engaged, personalized, and effective learning experiences.

Local Literature

Digital note-taking: An effective self-regulation tool in increasing academic achievement of Filipino students in a business mathematics online learning course

According to Calamlam (2023) the impact of utilizing digital note-taking applications as self-regulated learning

(SRL) tools in a business math course. The quality of digital note-taking positively influenced business math performance over two academic years, with notable differences in usage patterns between higher and lower achievers. Utilizing a causal-comparative design, the study examined the relationship between SRL strategies and academic achievement, using pre-test and post-test assessments to evaluate business math performance. Findings showed that while SRL tools improved achievement, higher achievers did not necessarily exhibit better self-regulation than lower achievers. These insights suggest that StudyBuddy, a collaborative study and note-taking app, can enhance learning by incorporating SRL-promoting features like task lists and timers. Emphasizing SRL skills and collaborative tools, StudyBuddy can significantly improve students' learning experiences and academic outcomes.

Learning with Mobile Phone: Evaluating Grammar Learning in Learning Objects

According to Oliveros (2024) a customized mobile application containing learning objects (LOs) aimed at improving grammar skills, specifically in active and passive voice usage. Using a descriptive-evaluative approach, the study assessed student perceptions with the Learning Object

Evaluation Scale for Students (LOES-S) across learning, quality, and engagement dimensions. Results showed the app significantly enhanced grammar competence, with students rating it positively in terms of utility and value. Conducted with 31 Grade 7 students in Quezon Province, Philippines, the research found substantial positive evaluations in learning, quality, and engagement, demonstrating the app's effectiveness in grammar education. These findings suggest that StudyBuddy, a collaborative study and note-taking app, can enhance student learning by integrating features that promote active engagement, user-centric design, and collaborative learning. By catering to diverse learning styles and preferences, StudyBuddy can support both note-takers and non-note-takers, providing tools for a personalized learning experience and improving academic performance. Additionally, StudyBuddy can help educators implement flexible teaching strategies to meet varied student needs, fostering active engagement and better learning outcomes.

The Effectiveness of a Customized Online Collaboration Tool for Teaching and Learning

According to Tarun (2019), there is a huge array of educational technology tools that are now in use today. These

tools have changed the way teachers teach and the way students learn. The study highlighted the growing popularity of web-based tools that facilitate messaging, file sharing, and assessments among students and teachers. Emphasizing the need for evaluating the effectiveness of these tools, the research assessed a customized online collaboration tool at a university in the Philippines using a mixed-methods approach. The study found that effective implementation of educational technology requires not only the availability of the tools but also an evaluation of their quality to enhance their utility. The findings underscore the importance of usability metrics in determining the effectiveness of such tools. These insights are valuable for the development and optimization of StudyBuddy, a collaborative study and note-taking app. By emphasizing user-friendly design and accessibility, StudyBuddy can improve student engagement and adoption. Additionally, the study's focus on collaborative features aligns with StudyBuddy's objective to provide a platform for students to create, share, and collaborate on study materials, ultimately enhancing the learning experience and academic success.

Foreign Studies

Is Technology Based Note-Taking More Preferable for Millennial Students? Exploration Of English Students' Note-Taking Habit

According to Murtafi'ah et al. (2020), they conducted descriptive qualitative research to investigate how university students practice note-taking, particularly focusing on their strategies and preferences for refining literature reviews in English academic writing. The study involved 62 English students in academic writing courses, using questionnaires and interviews to collect data. The findings revealed that 66.12% of millennial students preferred digital note-taking methods, particularly via mobile phones (54.84%), citing speed and convenience as key reasons. The study's implications highlight the increasing reliance on technology in education and the need for educators and institutions to adapt teaching methods and resources accordingly. Integrating technology-based note-taking tools, such as collaborative study apps like StudyBuddy, can enhance student engagement and collaboration by enabling real-time note-sharing and efficient organization of information. This trend emphasizes the importance of educators providing guidance on effective digital note-taking strategies to help students navigate and utilize these tools effectively. Adapting teaching practices to align with students'

preferences can create a more inclusive and engaging learning environment, tailored to the needs of millennial students.

Effectiveness of Digital Note-Taking on Students' Performance in Declarative, Procedural and Conditional Knowledge Learning

According to Sun & Li (2019), they conducted a careful examination to delve deeper into the effectiveness of digital note-taking through mobile terminals as a learning tool among high school students. The study involved 72 first-year high school students in a computer science course, divided into an experimental group using digital note-taking and a control group using traditional handwritten notes. Over three months, data showed that students using digital note-taking performed significantly better across all types of knowledge learning compared to those using conventional methods. The study's findings have significant implications for StudyBuddy, highlighting the potential of digital note-taking to enhance student learning outcomes. By incorporating features that support digital note-taking, StudyBuddy can help students efficiently record, organize, and review their notes, thus improving their performance in various types of knowledge learning. The platform's collaborative capabilities also allow students to share and discuss notes, fostering deeper understanding and engagement. These features can accommodate

different learning styles and benefit both high-performing and struggling students, making StudyBuddy a valuable tool in modern educational settings.

Metapholio: A Mobile App for Supporting Collaborative Note Taking and Refection in Teacher Education

According to Petko et al. (2019), the "Metapholio" app is designed to revolutionize teacher education by leveraging mobile technology to foster reflection among pre-service teachers. This app facilitates capturing classroom moments via multimedia recordings and supports collaborative reflection and discussion among pre-service teachers, educators, and mentors. Grounded in educational research on professional reflection and noticing, it integrates theory and practice to enhance teachers' professional development. Case studies during teaching internships demonstrated positive outcomes, such as improved ability to connect theory with practice and elaborate reflections. However, further research is needed to optimize app usage and measure its impact on reflective skills and teaching quality. The insights from Metapholio suggest opportunities for StudyBuddy, emphasizing its role in promoting active engagement, knowledge sharing, and collaborative learning among students in educational settings.

Local Studies

Development and Evaluation of Study-Buddy Pairing Application for Android

According to Bencito et al. (2020), their study focused on developing a mobile application aimed at fostering collaborative studying and peer tutoring among students. Their research utilized a descriptive-developmental research design, emphasizing iterative refinement of visual design, user interaction, functionality, compatibility, performance, stability, and security. The application, rigorously evaluated against Android Development Standard criteria, demonstrated strong performance and usability, incorporating features such as user registration, profile personalization, study buddy pairing suggestions, and integrated chat functionality. These findings suggest that StudyBuddy could benefit from similar functionalities to enhance its support for collaborative learning and peer tutoring, potentially improving student academic success through effective mobile technology utilization. By incorporating features like personalized study buddy matching, group chat, and shared study materials, StudyBuddy could create a dynamic and engaging platform for students to connect, collaborate, and learn from each other. This approach aligns with the growing trend of mobile-first learning, which recognizes the

importance of accessibility and user-friendliness in educational technology.

Students' Perspectives on the Integration of Online Collaboration Tools for Learning

According to Buraga (2019), the study was conducted to determine the students' perspectives on the integration of Online Collaborative Tools in Learning. Specifically, it aimed to determine the online tools used by the students, identify the challenges encountered, assess the benefits, determine student needs, and find out the difference in perceptions between ICT and non-ICT students. The study identified Google Apps as the most used online collaborative tool and highlighted challenges such as internet connectivity issues, limited computer access, and financial constraints faced by students. Results indicated that both ICT and non-ICT students perceived online collaborative tools as beneficial for learning, with ICT students showing stronger agreement. The study underscores the importance of user-friendly platforms to enhance student engagement and learning outcomes, aligning with StudyBuddy's goals. StudyBuddy can integrate features like task lists, timers, and an educational marketplace to support collaboration and address challenges identified in the study, ensuring accessibility

and usability across various learning environments. By doing so, StudyBuddy has the potential to bridge the digital divide and empower students to effectively utilize online tools for their academic success.

A Comparison of the Effectiveness of Four Note-Taking Methods in Memorization and Comprehension of Grades 9 to 12 Students in an Online Setup

The study conducted by Santos Santos et al.(2022) examined the effectiveness of four note-taking methods—plain traditional, plain digital, colored traditional, and colored digital—in enhancing memorization and comprehension among Grades 9 to 12 students in an online learning setup. Through a controlled experiment involving memorization and comprehension tests, the researchers found that the Plain Traditional Group achieved the highest average scores in comprehension, highlighting the continued effectiveness of handwritten notes in aiding understanding and retention. Meanwhile, the Colored Traditional Group demonstrated the most consistent performance, showcasing the benefits of incorporating color to enhance organization and focus. In contrast, the results for memorization showed no significant differences across the four note-taking methods, suggesting that note-taking techniques may have a

more substantial impact on comprehension than on short-term recall. Overall, the study emphasizes the value of traditional note-taking, even in online learning environments, while providing insights into how color and digital tools influence students' academic performance. The study by Santos, Benavidez, Benavidez, and Eugenio (2022) highlights the effectiveness of organized and enhanced note-taking methods in academic performance. This aligns with our objective to develop StudyBuddy, a collaborative note-taking app with organizational tools and collaborative features to address disorganized notes, foster teamwork, and enhance student engagement, productivity, and academic success among CHMSU-A students.

Synthesis

Table 1.

Synthesis

System/ Study Name	Creating and sharing of notes	Interactive	Research Collaboration	Chat Functionality	Feedback Management System	Marketplace section within the app	Categorization of notes	Task and Timers
1.Studybuddy A Collaborative Study and Note-taking App for Students	✓	✓	✓	✓	✓	✓	✓	✓
2.Transformation or Evolution? Education 4.0, Teaching and Learning in The Digital Age	✗	✓	✗	✓	✓	✗	✗	✗
3. The Effects of Collaborative Note-Taking in Flipped Learning Contexts	✓	✗	✓	✗	✗	✗	✗	✓
4.Understanding the role of digital technologies in education: A review	✗	✓	✗	✗	✓	✗	✗	✓
5.Digital note-taking: An effective self-regulation tool in increasing academic achievement of	✓	✓	✗	✗	✓	✗	✓	✓

Filipino students in a business mathematics online learning course								
6.Learning with Mobile Phone: Evaluating Grammar Learning in Learning Objects	✓	✓	✗	✗	✗	✗	✗	✗
7.The effectiveness of a Customized Online Collaboration Tool for Teaching and Learning	✗	✓	✗	✓	✗	✗	✗	✓
8.Is Technology Based Note-Taking More Preferable For Millenial Students? Exploration of English Students' Note-Taking Habit	✓	✓	✗	✗	✗	✗	✓	✗
9.Effectiveness of Digital Note-Taking on Students' Performance in Declarative, Procedural and Conditional Knowledge Learning	✓	✗	✗	✗	✗	✗	✓	✗
10.Metapholio App for Supporting Collaborative Note-Taking and Reflection in Teacher Education	✓	✓	✗	✗	✗	✗	✓	✗
11.Development and Evaluation of Study-Buddy Pairing Application for Android	✗	✓	✗	✓	✓	✗	✗	✗
12.Students'Perspectives on the Integration of	✗	✓	✗	✓	✗	✗	✗	✓

13. Online Collaboration Tools for Learning A Comparison of the Effectiveness of Four Note-Taking Methods in Memorization and Comprehension of Grades 9 to 12 Students in an Online Setup	✓	✗	✗	✗	✗	✗	✗	✗

Legend: (x)_____; (✓)_____

Note. Data synthesized from various studies.

Table 1 shows the existing literature on digital learning tools that highlights their potential to improve student learning experiences. Studies have shown that digital note-taking and mobile learning apps enhance skills like grammar competence and academic achievement. However, gaps remain in research, particularly regarding their sustained effects on student performance and knowledge retention. Future research should explore best practices for integrating these tools into teaching methods to optimize their use in education. Out of the twelve related pieces of literature and studies, The system closest to StudyBuddy is "Digital Note-Taking: An Effective Self-Regulation Tool". It includes multiple functionalities such as creating and sharing notes, interactivity, and categorization. However, StudyBuddy still surpasses it by incorporating additional features like research

collaboration, chat functionality, feedback management, a marketplace section, and task management tools, making it a more robust platform overall. *StudyBuddy* stands out by integrating features such as note-sharing, interactivity, research collaboration, chat functionality, feedback management, a marketplace, note categorization, and task management tools. Unlike other systems, it provides a holistic approach to academic support, addressing organizational, collaborative, and productivity needs. By combining essential features in one platform, StudyBuddy offers an effective solution for collaborative learning and streamlined academic support.