A Digital Approach to Teach Synthesis Writing for a Defence University: A Needs Analysis

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Abstract
Synthesis writing, a critical skill for university students, involves selecting, organizing, and connecting information from multiple texts. However, many students struggle with this task, highlighting a need for effective instructional approaches. In the wake of the Covid-19 pandemic, which has reshaped educational practices, there is a pressing need to reconsider teaching methods and incorporate digital approaches to align with contemporary learning paradigms. This study investigates the necessity of developing a mobile app module for teaching synthesis writing in a defence university setting in Malaysia. Ultimately, the research poses a central question: What are the perspectives of educators in a defence university in Malaysia regarding the necessity of developing a mobile application module for teaching synthesis writing? Through semi-structured interviews with five educators, the study explores their perspectives on the importance, challenges and strategies associated with teaching synthesis writing, as well as their readiness to integrate mobile technology into instruction. Thematic analysis of the data reveals four main themes: the importance of synthesis writing, challenges in teaching synthesis writing, learning strategies employed by educators, and the readiness to adopt mobile technology for teaching synthesis writing. The findings underscore the significance of this study for mobile application designers, English language educators, and course designers, providing insights into the specific needs and preferences regarding synthesis writing instruction. Furthermore, the study contributes to both theory and practice in education by addressing the growing demand for digital tools in writing instruction and highlighting the potential of mobile applications to enhance students' writing skills.

Keywords: English as a Second Language, digital approach, mobile, needs analysis, synthesis writing
Introduction

English has been the language of knowledge in universities for a long time. It has also become the information content delivery in tertiary education worldwide (Richards & Pun, 2021). Historically, teaching and learning English as a second or foreign language has been emphasized as the worldwide domain of teaching language skills (Yaccob et al., 2022b; James Hartshorn et al., 2019). In Malaysia, universities have long used English as the language of communication as it has been learned as a Second Language (L2) since school (Yaccob et al., 2022a). This practice is particularly prominent in the defense university in Malaysia, where English serves as a second language and is actively encouraged in English-related subjects, as well as throughout official modules and learning syllabuses (Ab. Rahman et al., 2023a; Ab. Rahman et al., 2023b). In universities, students also need to be able to use English for academic purposes, including writing synthesis essays. As English is not the mother tongue for most Malaysians, the ability to write effective synthesis essays may be influenced by students' language proficiency. Students' usual problems in English writing include academic writing conventions, vocabulary, and language use (Narayanan & Mathew, 2020; Muamaroh et al., 2020). These problems are common because mastery of writing requires an extensive process with numerous steps. Such a process requires students to not just acquire the linguistic aspects but also possess the right attitude as students need to engage in continuous practice in writing (Muamaroh et al., 2020).

Within the context of the defense university, an investigation into synthesis writing revealed significant obstacles faced by students. Bakar (2018) highlighted these challenges, particularly during the stages of reading and selecting relevant research articles, as well as constructing a comprehensive synthesis essay. Another study within the defense university, conducted at the onset of the Covid-19 Movement Control Order (MCO), scrutinized the English for Academic Writing course, which encompasses elements of synthesis writing (Bakar, 2021). This course gained increased significance amidst the shift to online learning platforms necessitated by the pandemic. Instructors, navigating the unfamiliar terrain of online education, sought effective pedagogical strategies to ensure continued teaching and learning.

The global pandemic underscored the urgency for educators to swiftly adapt to the digital realm, prompting a reassessment of teaching methodologies and the integration of relevant technological tools. As evidenced by Bakar’s (2021) study at the defense university, which explored the incorporation of collaborative learning and feedback through digital approaches in the academic writing course, the findings demonstrated a positive reception. This not only highlights the adaptability of students but also emphasizes the importance of an educational environment that embraces technological advancements to optimize learning outcomes. However, despite the growing recognition of the importance of digital tools in education, there remains a notable gap in understanding the most effective strategies for integrating these tools into synthesis writing instruction.

This study endeavours to address a critical gap in the literature by examining the necessity of developing a mobile application module for teaching synthesis writing, with a specific focus on...
the perspectives of educators within a defence university in Malaysia. By delving into educators' readiness to embrace mobile app technology for synthesis writing instruction, this research endeavours to elucidate the potential advantages and obstacles associated with this innovative approach. The significance of this study transcends both theoretical and practical realms within the field of education. From a theoretical standpoint, it contributes to the expanding body of literature concerning the integration of technology into teaching and learning, particularly in the domain of writing instruction. By focusing on synthesis writing, it offers valuable insights into how digital tools can be effectively utilized to augment students' writing skills, catering to the needs of contemporary learners.

On a practical level, the findings of this study hold substantial implications for educators, curriculum developers, and educational technology designers alike. Discerning educators' viewpoints on the integration of mobile apps for synthesis writing instruction, can inform the development of robust teaching methodologies and curriculum frameworks that harness the potential of digital resources. Furthermore, it serves as a guiding beacon for mobile application designers striving to craft user-friendly and pedagogically sound platforms tailored to enhance writing proficiency. In line with these considerations, the research objectives of this study are twofold: first, to investigate the necessity of developing a mobile application module for teaching synthesis writing in a defence university context, and second, to explore educators' perspectives and readiness regarding the adoption of mobile app technology for synthesis writing instruction.

To guide this exploration, four primary research questions have been formulated:

1. What is the underlying importance of synthesis writing for students within the context of a defence university?
2. What are the prevalent challenges or obstacles encountered in the teaching of synthesis writing?
3. How do students express their preferences regarding the learning of synthesis writing?
4. What are educators' perspectives regarding the adoption of a mobile application for teaching synthesis writing, and what factors influence their opinions?

Literature Review

Importance of Synthesis Writing

Synthesis writing poses one of the most significant challenges for university students (Van Ockenburg et al., 2019). This form of writing is usually serious in nature as students need to read, select, organize and connect information from multiple source texts to produce an essay (Spivey & King, 1989). Although synthesis writing skills are rarely taught as a course in universities, it is usually embedded as a component in academic writing courses as most students experience difficulties in writing academic papers when it comes to academic writing (Musaljon et al., 2021). This skill is one of the requirements that students of English as a Second Language (ESL) should have at Malaysian tertiary levels because the assessment of students relies on the written form obtained through coursework or written examination (Jalleh & Mahfoodh, 2021). The importance
of synthesis writing skills extends beyond university work as it increases the employability rates of graduates in the workforce (Hundarenko, 2020).

Synthesis writing requires an integration of reading and writing skills. Reading and writing skills are the psycholinguistic and social components of communication. Acquisition of these skills is imperative in the context of higher education because it contributes to academic literacy (Castillo-Martínez & Ramírez-Montoya, 2021). However, synthesis writing does not simply involve a "reading-then-writing" strategy but demands a complex interaction of reading and writing processes (Vandermeulen et al., 2023). Based on the cognitive writing model by Flower and Hayes (1981), synthesis writing is cognitively more taxing because it adds an extra step during the planning stage, which is multiple-text comprehension. This is why synthesis writing is more complex and challenging to complete. It requires training in specific skills (select, organize and connect) to help students create a synthesized text (Luo & Kiewra, 2019). A lack of synthesis writing skills can lead students to commit plagiarism (Clarke et al., 2023; Romanowski, 2022). Plagiarism is a severe offence in universities and may cause students to be penalized and even expelled. Thus, to avoid plagiarism, students must write effective synthesis essays.

**Interventions and Synthesis Writing**

Several intervention studies have been carried out to improve students' synthesis writing skills, and one of the most prominent strategies is the incorporation of explicit instruction. Explicit instruction on how to write an effective synthesis essay is essential to guide students in constructing a well-synthesized essay (Castells et al., 2023; Luna et al., 2022; List et al., 2021; Van Ockenburg et al., 2019). This strategy is notable in increasing the degree of connection in students’ synthesis writing (Luna et al., 2022) and also their self-regulation (Luna et al., 2020). Another notable strategy for improving students' synthesis writing is by including extensive practice in the lesson (Van Ockenburg et al., 2019). This strategy contributes effectively to improving students’ performance in synthesis writing (Van Ockenburg et al., 2019). In academic writing, digital platforms allow students to engage in writing activities outside academic hours, providing students with the extra drill they need to acquire complex writing skills (Yunus et al., 2019). Feedback is also crucial in students' development of synthesis writing skills as students are made aware of their mistakes in their writing and can learn from their mistakes by making corrections (Muamaroh & Pratiwi, 2021; Zhang & Cheng, 2021). This strategy then helps students improve their writing by minimizing errors in their assignments (Muamaroh & Pratiwi, 2021). Collaborative learning is also another potential strategy in higher education, which encourages the joint construction of knowledge (Putzeys, 2024; Herrera-Pavo, 2021). Research shows that collaborative learning effectively improves synthesis writing (Putzeys, 2024; Musaljon et al., 2021). Previous research proved that this strategy is effective in increasing students’ competence and comfort in learning (Musaljon et al., 2021). Collaboration is one of the strategies derived from constructivism, suitable for a military learning environment (Juhary, 2022). This strategy is also effective when paired with digital approaches (Ngamsomjit et al., 2022; Khan et al., 2021).
Digital Platforms and Synthesis Writing

Digital platforms are not new to the academic world (Lukas & Yunus, 2021; Omar et al., 2012). However, the COVID-19 pandemic has compelled universities worldwide to shift entirely to an online learning mode, emphasizing the educators' full utilization of digital platforms. Digital platforms have been made the new normal in education after the pandemic (Rafiq et al., 2022b; Lukas & Yunus, 2021). Although universities have re-opened, the mode of learning in universities has diversified to a hybrid learning system where physical classes are seamlessly combined with online sessions (Hilli et al., 2019). This move aligns with the fourth goal of the Sustainable Development Goals (SDG) to promote lifelong learning opportunities for all (Jensen, 2022). Moreover, digital competence is one of the key competencies for lifelong learning (Alarcón et al., 2020). Since COVID-19 has altered the dynamics of teaching and learning, the promotion of learner autonomy is essential as it is also a key aspect in fostering lifelong learning for all (Rahman et al., 2022). As a result, writing interventions via digital platforms have increased their importance in education, such as mobile applications (Castillo-Martínez & Ramírez-Montoya, 2021; Limpo et al., 2020).

Mobile Applications and Synthesis Writing

It is important to note that incorporating mobile applications in the teaching and learning process in universities has escalated in the 21st century as its convenience renders positive outcomes in students' learning (Elaish et al., 2019; Hashim et al., 2018). As a teaching and learning support, mobile applications help to boost students' achievements in second language instruction in universities, as learning a language involves many communication modalities that can be supported by mobile devices (Elaish et al., 2019). Mobile phones are also often accessible and frequently used in higher education (Jeong, 2022; Hashim, 2018). Accessibility, which is a trait of mobile learning, enables students to engage in self-directed learning outside traditional classroom settings, which is crucial for motivated and autonomous learning (Jeong, 2022). To create a mobile application, it is essential to undergo a needs analysis to determine the content of the mobile learning module to cater to users' needs (Rafiq et al., 2022; Rafiq et al., 2019).

Method

Research Instrument

The research was conducted using a qualitative research design to explore the needs of a defence university in creating a mobile app module to teach synthesis writing. The educators' responses were collected using a semi-structured interview in a one-to-one session with the researcher. The interview questions were constructed based on Dudley-Evans and St John's Needs Analysis Model (Dudley-Evans & St John, 1998). This model was chosen as the basis of this study because it is comprehensive as it covers four types of needs analysis namely: Target Situation Analysis (TSA), Present Situation Analysis (PSA), Learning Situation Analysis (LSA) and Means Situation Analysis (MSA) (Romanowski, 2017). The interview protocol was adapted from Rafiq
et al., (2022) based on the Dudley-Evans and St John’s Needs Analysis Model which includes importance (TSA), problems (PSA), strategies (LSA) and mobile readiness (MSA). To gauge a comprehensive needs analysis to create a mobile application module to teach synthesis writing, these four aspects were included in the study: (1) the importance of synthesis writing, (2) problems in teaching synthesis writing, (3) learning strategies used in teaching synthesis writing, and (4) mobile readiness in teaching synthesis writing.

Participants

The study was conducted during the transitional phase from pandemic to endemic in Malaysia in 2022, specifically during Semester 2 Session 2021/2022. Interviews with participants were carried out both face-to-face and online via Google Meet, with the mode of interaction being contingent upon the respondents' availability and preference. This hybrid approach facilitated broader participation and accommodated the diverse circumstances of the participants, ensuring inclusivity and maximizing the richness of the data obtained. According to Dodds and Hess (2021), there is little difference between online and face-to-face interview sessions in qualitative research when ethical procedures are fulfilled. The educators are from a defence university in Malaysia and were teaching the English for Academic Writing course at that time. They were chosen as the target group as this population can provide more insights regarding the need for teaching synthesis writing via a mobile application.

Purposeful sampling was utilized in selecting the respondents for the interview. This sampling method is chosen to ensure rich data, as it allows the researcher to focus in-depth on relatively small samples. The Language Centre of the defence university is small, with approximately 50 staff. Five out of 17 educators teaching the English for Academic Writing course were interviewed for the study. All participants in our study were female. The age range fell between 36 and 46 years old. They had varying levels of experience in teaching, with years of service ranging from 13 to 23 years. Three of the participants held a master's degree, and two of them held a doctoral degree, reflecting their high educational attainment and expertise level. Our participants had served as course coordinators for the English for Academic Writing course. This additional detail underscores their significant roles and in-depth familiarity with the course's challenges and requirements. As qualitative research emphasizes the depth and richness of data to explore and understand complex phenomena in detail, small sample sizes are well-suited to facilitate in-depth examination (Creswell & Poth, 2016). No new themes or significant insights emerged after conducting interviews with the five educators, suggesting that the sample size was sufficient to reach data saturation, a critical criterion in qualitative research (Creswell & Poth, 2016).

Research Procedures

Respondents gave their consent to be interviewed and audio-recorded at the beginning of the one-to-one interview session with the interviewer. The interview was conducted until the data
was saturated and no new information was obtained. The semi-structured interviews lasted for approximately 30 to 40 minutes for each respondent. After the recordings were transcribed, they were returned to the respondents for member checking, a crucial step in ensuring the credibility of the data. This process involved the participants validating the data findings and interpretations, contributing to the establishment of trustworthiness, particularly concerning the concepts of validity, which is a crucial concern in ensuring the quality of qualitative research (Ang et al., 2016).

The interview was transcribed verbatim. Data from the interview were analysed using NVivo software by incorporating thematic analysis. Thematic analysis was utilized to identify patterns or themes within the qualitative data (Braun & Clarke, 2006). The steps include: (1) familiarising yourself with the data; (2) generating initial codes; (3) searching for themes; (4) reviewing themes; (5) defining and naming themes; (6) producing the report.

Results

The results from the analysis are presented under the following four main themes: (1) the importance of synthesis writing, (2) problems in learning synthesis writing, (3) strategies in teaching synthesis writing, and (4) mobile readiness in teaching synthesis writing. There are 11 subthemes under these four main themes. This result is summarized in Table One.

Table 1. Summary of the main themes and subthemes of the needs

<table>
<thead>
<tr>
<th>Themes</th>
<th>Subthemes</th>
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<tbody>
<tr>
<td>1. The importance of synthesis writing</td>
<td>• Fulfilment of university requirements</td>
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<tr>
<td></td>
<td>• Avoid plagiarism</td>
</tr>
<tr>
<td>2. Problems in the teaching of synthesis writing</td>
<td>• Complex writing process</td>
</tr>
<tr>
<td></td>
<td>• Poor language proficiency</td>
</tr>
<tr>
<td>3. Strategies for teaching synthesis writing</td>
<td>• Collaborative learning approach</td>
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<td></td>
<td>• Explicit instruction</td>
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<td>• Corrective feedback</td>
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<td></td>
<td>• Extensive practices</td>
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<tr>
<td>4. Mobile readiness in teaching synthesis writing</td>
<td>• Convenience</td>
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<tr>
<td></td>
<td>• T&amp;L support</td>
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<td>• Accessibility</td>
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The need to create a mobile app module to teach synthesis writing is shown in Table One. For the first theme, a mobile app module is needed because of the importance of synthesis writing. Synthesis writing skills are vital for fulfilling university requirements and avoiding plagiarism. Second, the mobile app module is essential to solving problems in teaching synthesis writing. Teaching synthesis writing is difficult due to its complex writing process and students' poor language proficiency. Third, a mobile app module is also vital to include important strategies for teaching synthesis writing. Strategies including a collaborative learning approach, explicit instruction, corrective feedback and extensive practices are important for students to acquire synthesis writing skills. Finally, a mobile app module is relevant due to the educators' readiness to teach synthesis writing using a mobile app because it makes teaching more convenient, and accessible and serves as good teaching and learning (T&L) support.
The Importance of Synthesis Writing

Fulfilment of University Requirements

In this section, we delve into the subtheme of "Fulfilment of university requirements" to better understand the educators' perspectives on the significance of synthesis writing within the academic landscape. The inquiry aimed to gauge the educators' views on synthesis writing and its importance. The respondents unanimously emphasise synthesis writing emerges as a fundamental and indispensable skill at the university level. The university environment places considerable demands on students, necessitating proficiency in synthesis writing for various academic endeavours. As elucidated by Respondent One, synthesis writing serves as a crucial preparation for students' final-year projects (FYP), a prerequisite for graduation. Furthermore, synthesis writing extends beyond FYP preparations, as Respondent Five highlighted, "They need to do many assignments." This insight underscores the ubiquity of synthesis writing across university courses, an observation echoed by Respondent Two, who remarked, "I think it will cover all fields of study."

These findings resonate with previous research, underscoring the centrality of synthesis writing in university settings (Jalleh & Mahfoodh, 2021; Musaljon et al., 2021). Given that the core of university work revolves around students' ability to produce synthesis writing for academic purposes, mastering this skill becomes an inevitable academic necessity.

Avoid Plagiarism

In this section, we explore the subtheme of "Avoiding Plagiarism" to provide a more comprehensive understanding of the skills and awareness associated with synthesis writing, particularly within the university context. The inquiry aimed to investigate the significance of these skills and their role in preventing academic misconduct. At the tertiary level, students are presented with assignments requiring synthesising information from various sources to create their essays. These tasks demand a particular set of skills essential for university students. Without a firm grasp of synthesis writing, students may be tempted to resort to plagiarism, a grave academic offence with long-lasting consequences. As articulated by Respondent Five, the absence of these crucial skills can lead to students attempting to complete assignments without the necessary background knowledge, potentially resulting in plagiarism issues. It is evident that awareness plays a pivotal role in this context, as emphasised by Respondent Four, who noted that equipping students with proper synthesis writing skills "helps them to reduce the act of copying and pasting work from other sources."

These findings highlight the significance of awareness and proficient writing skills in preventing plagiarism. The importance of these insights cannot be overstated, as they align with established literature emphasising the link between weak writing skills and plagiarism (Clarke et al., 2023; Romanowski, 2022). To excel in the university setting and uphold academic integrity, students must acquire synthesis writing skills to produce high-quality synthesis essays, mitigating the risk of plagiarism.
Problems in the Teaching of Synthesis Writing

Complex Writing Process

The "Complex Writing Process," subtheme centres on the educators’ challenges and intricacies in teaching synthesis writing. The aim is to shed light on the multifaceted nature of synthesis writing and the specific difficulties students encounter. One of the most prominent subthemes pertains to the intricate nature of synthesis writing. This academic task demands that students engage in a multifaceted writing process encompassing the selection, organisation, and connection of information from various texts. Respondent One eloquently captures students' challenges when selecting essential points from texts. They noted that students often struggle with discerning the significance of information, expressing that students tend to perceive "everything as important" and may "overlook critical details necessary to support their arguments."

The organisational aspect of synthesis writing is equally daunting, as highlighted by Respondent Two, who referred to students' difficulties in categorising and structuring the information they have gathered into coherent and cohesive writing. Moreover, students often encounter challenges when attempting to connect their ideas seamlessly, resulting in difficulties in "making sense of what they are writing," as mentioned by Respondent One. This issue is compounded by the struggle to combine diverse pieces of information into a cohesive narrative effectively.

The central challenge in teaching synthesis writing lies in the intricacies of this process, which are often unfamiliar to university students (Vandermeulen et al., 2023; Van Ockenburg et al., 2019). Mastery of synthesis writing necessitates that students learn to skilfully select, organise, and interconnect information culled from multiple texts, culminating in the creation of well-synthesised essays (Luo & Kiewra, 2019).

Poor Language Proficiency

This section delves into the "Poor Language Proficiency" subtheme as a significant challenge in teaching synthesis writing. Our exploration aims to elucidate the critical role of language proficiency in the comprehension and construction of synthesis essays, focusing on its implications for students' writing abilities. One of the primary challenges encountered in teaching synthesis writing pertains to students' language proficiency. The proficiency of language forms the bedrock upon which successful synthesis writing relies. As highlighted by Respondent Three, synthesis writing necessitates a certain level of language comprehension, demanding that students possess a good grasp of the language to discern the main ideas and nuances embedded within the texts they encounter. Respondent Three aptly noted, "it requires a certain level of understanding; you need to have good language proficiency to understand the main idea or the gist of what they are reading."

The consequences of poor language proficiency manifest in various aspects of synthesis writing. When students grapple with understanding the text due to language barriers, the ability to select crucial information becomes compromised, as pointed out by Respondent Four, who noted that high-level language articles could pose difficulties in pinpointing key points. This struggle
can further lead to omitting essential details, as articulated by Respondent Five, who observed that students often leave out pertinent information due to comprehension challenges. Moreover, poor language proficiency can significantly impact students' ability to express themselves effectively in their writing. Respondent Two highlighted this issue, noting that a "lack of their own voice in the writing" becomes apparent when students attempt to translate their thoughts into written essays. Consequently, their essays may closely resemble the original text, increasing the risk of unintentional plagiarism, as emphasised by Respondent One.

The challenges posed by poor language proficiency extend beyond individual writing tasks and have broader implications for the teaching of synthesis writing. Students' comprehension of given texts and their ability to produce well-synthesised essays are undeniably influenced by their language proficiency. These findings align with existing literature that underscores the impact of vocabulary and language proficiency on writing (Narayanan & Mathew, 2020; Muamaroh et al., 2020).

**Strategies for Teaching Synthesis Writing**

*Collaborative Learning Approach*

This section delves into the "Collaborative Learning Approach" subtheme and its profound significance in teaching synthesis writing. The exploration aims to illuminate the various dimensions of collaborative learning and its pivotal role in fostering an enriching and effective environment for students' development of synthesis writing skills. Respondents unanimously favoured a collaborative learning approach when asked about their preferred methods of teaching synthesis writing. As highlighted by Respondent Two, collaborative learning offers students an advantageous learning environment where they can not only acquire knowledge but also seek assistance from their peers who possess a deeper understanding of writing strategies and the subject matter. Respondent Two eloquently noted, "I found out that students prefer a collaborative style of learning as they get to learn and ask for help from their group members who have a better understanding of the writing strategies and the topic."

This collaborative approach extends beyond mere assistance; it fosters student motivation and engagement. Respondent Three emphasised that students display heightened motivation and active participation when working in groups, leading to more substantial contributions and a richer learning experience. The synergy generated within collaborative settings allows members to share their unique insights and perspectives, contributing to a collective learning journey that benefits all involved. As Respondent Three articulated, "if they work in a group, everybody has got different things to contribute. They can share as much as they can, so the learning becomes better."

Moreover, the advantages of collaborative learning manifest not only in enhanced learning outcomes but also in improved performance. Respondent Four underscored that when students collaborate and collectively edit their essays, the resultant work attains higher quality, translating into improved grades.
Collaborative learning also nurtures a safe and encouraging atmosphere for students to seek clarification and actively participate in discussions, as Respondent Four noted, "Students don't like to ask questions, but when I focus group by group, they are willing to ask questions. They are not reluctant… They don't hesitate." The evidence gleaned from this study strongly aligns with prior research that highlights the efficacy of collaborative learning in teaching synthesis writing (Putzeys, 2024; Musaljon et al., 2021). Given the complexity of synthesis writing, characterised by high-level thinking and multifaceted tasks, collaborative learning emerges as an invaluable pedagogical strategy. It eases students' learning journey and creates a nurturing environment that facilitates exploration and mutual learning. Furthermore, this preference for collaborative learning harmonises with military pedagogy (Juhary, 2022), underscoring its adaptability and relevance across various educational contexts.

Explicit Instruction

In this section, we delve into the "Explicit Instruction" subtheme, shedding light on its paramount importance in the pedagogical realm of teaching synthesis writing. The exploration aims to elucidate the multifaceted dimensions of explicit instruction and its indispensable role in equipping students with the skills essential for synthesis writing. Respondents within our study unanimously underscored the pivotal role of explicit instruction in nurturing synthesis writing skills. As articulated by Respondent Two, the intricate skillset demanded by synthesis writing does not naturally develop within students; it necessitates meticulous guidance and instruction. Respondent Three echoed this sentiment, affirming that for academic writing, comprehensive lectures and methodical content breakdown are indispensable: "For academic writing, we cannot change the nature of giving the lecture, again the content itself, we have to teach them one by one."

Explicit instruction takes various forms, from traditional lecture-based approaches to more interactive teaching methods. Respondent Four, for instance, preferred the classic "chalk and talk" method, emphasising the need for detailed demonstrations on the chalkboard to convey the intricacies of synthesis writing effectively. This sentiment underscores the enduring value of time-tested instructional techniques. Furthermore, students' journey toward mastering synthesis writing is not solely reliant on educators' guidance but also involves access to valuable resources. Respondent Five highlighted the significance of reference books as supplementary sources of information. These resources serve as comprehensive guides, aiding students in navigating the complexities of synthesis writing.

The complexity of synthesis writing, characterised by the intricate fusion of reading and writing processes, necessitates explicit instruction as the guiding force that leads students toward mastery. Our findings resonate with previous literature, which underscores the effectiveness of explicit instruction accompanied by written guidance instead of alternative instructional methods (Luna et al., 2022). Notably, this instructional approach aligns with the insights gleaned from prior research, reinforcing the notion that explicit instruction, whether delivered through traditional means or modern pedagogical aids, serves as an invaluable tool in the synthesis writing journey.
Corrective Feedback

Within the realm of teaching synthesis writing, the “Corrective Feedback” subtheme emerges as a pivotal strategy, intricately intertwined with cultivating students’ synthesis writing prowess. In this section, we delve deeper into the multifaceted significance of corrective feedback, elucidating its role as a beacon of guidance, enabling students to navigate the intricate path toward mastery. Corrective feedback within the context of writing tasks possesses immense pedagogical value, offering students a transformative learning experience. As elucidated by Respondent One, feedback serves as a precious resource through which students can learn from their mistakes and, in turn, enhance the quality of their essays.

The ability to rectify errors based on feedback proves invaluable in students’ synthesis writing journey. Respondent One emphasised this point, noting that her students proactively engage with feedback, revising and modifying their essays following the provided comments. In her words, “Students will rectify their mistakes and modify their essay according to my comments, and I find that is very useful to help them to make, hmm, produce a better essay.” This personalised guidance empowers students with a clearer roadmap for improvement. Furthermore, the complexity inherent in synthesis essays, characterised by myriad processes, further accentuates the significance of feedback. Respondent One’s insights underscore the practical utility of feedback, allowing students to pinpoint specific areas within their essays that require correction. She noted, “Students find it (feedback) useful because they know where to modify their work, which part of the essay that they should correct.”

In essence, corrective feedback becomes a compass, directing students toward refining their synthesis writing skills. Respondent Two echoed this sentiment, emphasising the immediacy of feedback as a critical element in the learning process. She highlighted the importance of activities offering students timely feedback on their endeavours, aligning with students’ desire for real-time insights into their progress. In her words, these activities “should be in the form of something that can give them immediate feedback with what they are doing because that’s what they are seeking actually when... when we are having a class with them.” This real-time engagement with feedback informs students and fosters a dynamic learning environment that catalyses improvement. Our findings resoundingly align with prior research in the field, which consistently underscores the positive impact of corrective feedback on students’ essay production (Muamaroh & Pratiwi, 2021). The pedagogical value of feedback as a tool for enhancing synthesis writing skills resonates with the broader educational literature, affirming its place as a cornerstone in scaffolding students’ writing proficiency.

Extensive Practices

Within the framework of teaching synthesis writing, the "Extensive Practices" subtheme emerges as a dynamic strategy that educators have adeptly woven into their instructional methods. This section seeks to illuminate the multifaceted significance of extensive practices, offering a holistic understanding of its role in enhancing students' synthesis writing skills. As perceived by
our respondents, extensive practices encompass a diverse array of instructional tools and resources, including free online platforms, websites, and applications. These pedagogical assets serve as catalysts for engagement, transcending the boundaries of traditional teaching methodologies. One noteworthy avenue for extensive practice in our respondents' teaching repertoire is the integration of online educational games. As underscored by Respondent Three, these games hold an intrinsic appeal for students, invigorating the learning process with an element of enjoyment. The quote, "they (students) definitely enjoyed games," elucidates the student-centric allure of gamified learning.

The fusion of education and entertainment within online games captivates students and engagingly instils essential synthesis writing skills. Additionally, online quizzes have emerged as a popular tool in the arsenal of extensive practices. Respondent One expounds upon the pedagogical utility of quizzes, elucidating their role in gauging students' understanding and memory retention. Through quizzes, students can actively assess their grasp of the material and revisit key concepts in an enjoyable, interactive manner. "They do quizzes to help them to check their understanding and their knowledge," as noted by Respondent One, encapsulates the essence of this practice. Respondent Four echoes this sentiment, elaborating on the benefits of extensive practice through online quizzes. Their insights, "they (students) would enjoy, and I think it will be easier for them to remember whatever they have learned" and "it helps you to recall whatever things you have learned," underscore the mnemonic and revision advantages afforded by quizzes.

In the intricate landscape of synthesis writing, where the acquisition of skills hinges on repeated engagement, extensive practice through quizzes assumes a pivotal role. In consonance with prior research, our findings affirm the positive impact of extensive practices on students' synthesis writing performance (Van Ockenburg et al., 2019). The alignment with existing literature underscores the potency of this strategy in fostering skill acquisition. Furthermore, the infusion of excitement and enjoyment through engaging games and quizzes via websites and apps resonates with contemporary pedagogical approaches, emphasising the need for engaging, student-centric learning (Jeong, 2022).

**Mobile Readiness in Teaching Synthesis Writing**

**Convenience**

The subtheme of "Convenience" that emerged from our respondents' perspectives shines a spotlight on the transformative potential of mobile applications in the teaching and learning of synthesis writing. This section delves into the intricate web of conveniences these digital tools bring to the forefront, shedding light on their profound significance within the broader pedagogical landscape. Our final inquiry to the respondents revolved around their willingness to integrate mobile applications into the teaching of synthesis writing. The unanimous chorus of positivity that echoed through their responses underscores the pivotal role mobile apps can play in making the learning experience more convenient for educators and students. As articulated by Respondent One, the allure of mobile apps lies in their capacity to simplify and streamline the learning process.
She aptly remarked, "Mobile apps are there to make our lives easier or everything more convenient." This sentiment resonates with the belief that these digital tools hold the potential to alleviate the inherent complexities of synthesis writing instruction, enhancing efficiency and effectiveness. Furthermore, the sentiment, "they can ease up the learning process for teaching and learning," underscores the transformative nature of mobile apps in facilitating pedagogical tasks.

The aspect of accessibility takes centre stage in this subtheme, as elucidated by Respondent Four's observation that students increasingly prefer having their study materials readily accessible on their smartphones. "I think they would prefer everything on their phone," Respondent Four noted, highlighting the mobile app's role in meeting the evolving preferences of the digital-native generation. The convenience of accessing course materials and resources at one's fingertips aligns seamlessly with contemporary pedagogical paradigms. Moreover, the versatility of mobile applications shines through, with Respondent Two emphasising their potential for hybrid learning. Integrating mobile apps seamlessly complements traditional classroom instruction, opening up possibilities for blended teaching approaches. "We can hybridise the learning with the apps," Respondent Two articulated, emphasising the symbiotic relationship between conventional teaching methods and digital enhancements.

Beyond convenience, the theme of cost-efficiency emerges as a compelling subtext. Respondent Three shed light on the potential cost savings and environmental benefits of adopting mobile applications in teaching. "I think it would be very effective for us, the instructors because we don't have to prepare too much," Respondent Three noted, underlining the streamlined workflow that mobile apps facilitate. Furthermore, the shift towards paperless learning aligns harmoniously with the global push for sustainable education practices. In tandem with current trends in higher education, our findings resonate with the widespread adoption of mobile applications in universities, mirroring their numerous advantages in enhancing the teaching and learning process (Elaish et al., 2019). As academic institutions increasingly embrace digital elements to augment academic reading and writing (Castillo-Martínez & Ramírez-Montoya, 2021), the subtheme of "Convenience" underscores the pivotal role of mobile applications in facilitating this transition.

**Teaching and Learning Support**

The "Teaching and learning support" subtheme that emerged from our respondents' reflections is a testament to mobile applications' integral role in enhancing the educational journey. This section delves deeper into the multifaceted ways mobile apps serve as invaluable allies, elucidating their profound significance within the broader pedagogical landscape. Beyond convenience, respondents expressed their readiness to embrace mobile applications as potent allies for teaching and learning. Respondent One's insight, "to make it interesting, to make it easier for them to learn, yes technology can help definitely," resonates profoundly with the belief that mobile applications possess the transformative power to invigorate classroom dynamics and engage students more effectively. A common thread that weaves through these responses is that mobile
applications can act as catalysts for motivation. Respondent Four underscored the importance of providing stimulating activities to support learning, stating, "especially when you provide interesting activities to support the learning… I think it would definitely become interesting." This sentiment reflects the belief that mobile apps can infuse a sense of excitement and engagement into the learning process, making it more effective and enjoyable for students.

As elucidated by our respondents, mobile applications offer a treasure trove of activities and exercises tailored to hone synthesis writing skills. Respondent Four's mention of "interesting activities to support the learning" underscores the diverse pedagogical tools that mobile apps bring. These activities, carefully designed to align with curriculum objectives, facilitate skill acquisition and kindle students' enthusiasm for learning.

Recognising mobile applications as potent teaching and learning supports aligns harmoniously with established literature. Extensive research, such as the work of Elaish et al. (2019), highlights the positive impact of mobile learning on students' academic achievement. In an educational landscape increasingly defined by complexity and the demand for flexible learning modalities, digital resources emerge as indispensable tools that empower students to navigate the digital era competently. Moreover, as reinforced by Castillo-Martínez and Ramírez-Montoya (2021), the transition to virtual learning settings underscores the pressing need to equip higher education students with these digital aids. In an era where digital fluency is tantamount to success, mobile applications serve as indispensable companions on the educational journey, providing learning materials, motivation, engagement, and interactive learning experiences.

### Accessibility

One of the cornerstone subthemes that emerged from our study revolves around "Accessibility." This theme sheds light on how the inherent accessibility of mobile applications has ignited a collective readiness among educators to adopt them as powerful educational tools, underscoring their profound significance in transforming the educational landscape. Respondent One succinctly encapsulates the enduring nature of mobile applications with the phrase, "Mobile apps seem to be eternal." This eternal quality of mobile apps ensures their availability to students at all times, allowing them to revisit the learning materials whenever needed. As Respondent Two observes, "The skills need to be updated and improvised from time to time by the students." Mobile apps facilitate this process by offering a repository of resources that students can access and reference as they embark on various academic assignments, including writing theses and conducting research beyond their university years. Respondent Three contributes a poignant insight into the post-graduation utility of mobile applications. She aptly describes how these apps can serve as guides, essentially stepping into the role of instructors once students have left the university. This accessibility extends beyond the academic years, positioning mobile applications as lifelong learning companions that continue to nurture and hone synthesis writing skills. The profound impact of accessibility becomes especially evident when examining its implications for students.
The ability to access learning materials outside of traditional academic hours, as supported by studies such as Yunus et al. (2019), offers students a level of invaluable flexibility and autonomy. This accessibility empowers students to revisit and refresh their knowledge at their convenience, fostering self-directed and motivated learning journeys beyond traditional classrooms' confines. The resonance of this theme with established literature further underscores its significance. Research by Jeong (2022), Elaish et al. (2019), and Hashim (2018) consistently affirms the transformative potential of mobile learning in higher education. The accessibility afforded by mobile applications emerges as a catalyst for motivating students to engage in autonomous learning, a critical facet of modern education. Through this comprehensive contextualisation, the theme of "Accessibility" takes on profound significance, illuminating how the inherent accessibility of mobile applications empowers educators and students, fostering lifelong learning and redefining the boundaries of education in the digital age.

Discussion

The findings of this study shed light on several key aspects concerning the integration of mobile applications for teaching synthesis writing in a defence university context. These results are discussed below in relation to the existing literature.

Importance of Synthesis Writing

The educators in this study echoed previous research (Vandermeulen et al., 2023; Van Ockenburg et al., 2019), stressing the paramount importance of synthesis writing for university students, a sentiment supported by Luna et al. (2022), who identified synthesis writing as fundamental for academic success. Synthesizing information from multiple sources not only meets university requirements but also nurtures critical thinking and analytical skills crucial for higher education. This underscores the significance of synthesis writing, as highlighted in previous studies while providing further insights into educators' specific needs and challenges within a defence university setting, emphasizing the pressing need for innovative pedagogical approaches.

Moreover, the centrality of synthesis writing in university settings, resonating with previous research (Jalleh & Mahfoodh, 2021; Musaljon et al., 2021), cannot be understated. Given that producing synthesis writing is at the core of university work, mastering this skill becomes an inevitable academic necessity. Additionally, the findings underscore the importance of proficient writing skills in preventing plagiarism, aligning with established literature (Clarke et al., 2023; Romanowski, 2022). These insights emphasize the critical link between strong writing skills and academic integrity, highlighting the imperative for students to acquire synthesis writing skills to produce high-quality synthesis essays, thereby mitigating the risk of plagiarism.

Challenges in Teaching Synthesis Writing

In the context of the defense university, investigations into synthesis writing revealed significant obstacles faced by students. These challenges, as highlighted by Bakar (2018), particularly manifest during the stages of reading and selecting relevant research articles, as well as crafting comprehensive synthesis essays. The results from the current research indicate that...
educators identified various challenges in teaching synthesis writing, echoing the findings of Bakar (2018) and other previous studies (Luna et al., 2022; Van Ockenburg et al., 2019). These challenges include the complexity of the writing process, students' poor language proficiency, and the need for explicit instruction and feedback. Integrating mobile applications for synthesis writing instruction could address some of these challenges by providing interactive and accessible learning opportunities (Vandermeulen et al., 2023).

This study adds to the existing literature by elucidating the specific barriers faced by educators in implementing synthesis writing instruction and underscores the potential of mobile applications in overcoming these obstacles. The central challenge in teaching synthesis writing lies in the intricacies of this process, which are often unfamiliar to university students (Vandermeulen et al., 2023; Van Ockenburg et al., 2019). Mastery of synthesis writing necessitates that students learn to skilfully select, organise, and interconnect information culled from multiple texts, culminating in the creation of well-synthesised essays (Luo & Kiewra, 2019). Additionally, the challenges posed by poor language proficiency extend beyond individual writing tasks and have broader implications for the teaching of synthesis writing. Students' comprehension of given texts and their ability to produce well-synthesised essays are undeniably influenced by their language proficiency. These findings align with existing literature that underscores the impact of vocabulary and language proficiency on writing (Narayanan & Mathew, 2020; Muamaroh et al., 2020).

**Students' Learning Preferences**

The educators in this study extensively discussed students' preferences for learning synthesis writing, emphasizing the importance of engaging and interactive teaching methods, a finding consistent with the literature highlighting the significance of student-centered approaches in writing instruction (Luna et al., 2022). Mobile applications emerge as promising tools for meeting diverse learning styles and preferences, offering flexible and personalized learning experiences. This study contributes to the literature by providing insights into educators' perspectives on students' learning preferences and suggests that mobile applications could serve as valuable tools for promoting active and collaborative learning in synthesis writing instruction.

The onset of the global pandemic has hastened the urgency for educators to swiftly adapt to the digital landscape, prompting a reassessment of teaching methodologies and the integration of pertinent technological tools. Bakar's (2021) study conducted at the defense university, which delved into the integration of collaborative learning and feedback through digital means within the academic writing course, unveiled a positive response, highlighting students' adaptability and the pivotal role of embracing technological advancements in education. The current findings align closely with Bakar's (2021) earlier research at the same defense university, wherein educators echoed the importance of fostering a teaching and learning environment tailored to the demands of 21st-century learning, emphasizing learner-centeredness.

Moreover, the necessity for explicit instruction as a guiding force toward mastery in synthesis writing is underscored by our findings, aligning with prior literature emphasizing the effectiveness of explicit instruction accompanied by written guidance (Luna et al., 2022). The importance of corrective feedback in enhancing synthesis writing skills is also highlighted in our study, consistent with prior research (Muamaroh & Pratiwi, 2021). Furthermore, extensive practice
through quizzes emerges as a pivotal strategy in the acquisition of synthesis writing skills, aligning with existing literature (Van Ockenburg et al., 2019). The infusion of excitement and enjoyment through engaging games and quizzes via websites and apps resonates with contemporary pedagogical approaches, underlining the need for engaging, student-centric learning (Jeong, 2022).

**Opinion on Using Mobile Applications**

The educators in this study exhibited positive attitudes towards the utilization of mobile applications for teaching synthesis writing, recognizing their potential to enhance learning outcomes and foster student engagement, a sentiment echoed in the literature advocating for technology integration in writing instruction (Vandermeulen et al., 2023). However, alongside enthusiasm, concerns surfaced regarding the necessity for effective implementation strategies and sufficient technical support to ensure the seamless integration of mobile applications into educational contexts.

This study accentuates the significance of addressing these implementation challenges while suggesting avenues for further exploration to delineate effective strategies for integrating mobile applications into synthesis writing instruction and investigating their long-term impact on students' writing proficiency and academic success. The convenience afforded by mobile applications aligns harmoniously with the global drive towards sustainable educational practices, reflecting the widespread adoption of such tools in universities and their role in enhancing the teaching and learning process (Elaish et al., 2019). Moreover, in an educational landscape increasingly defined by complexity and the demand for flexible learning modalities, digital resources emerge as indispensable tools empowering students to navigate the digital era competently (Castillo-Martínez & Ramírez-Montoya, 2021).

These digital aids provide learning materials, motivation, engagement, and interactive learning experiences, facilitating a seamless transition to virtual learning settings and equipping higher education students with essential digital fluency skills. Additionally, the accessibility afforded by mobile applications, enabling students to access learning materials outside of traditional academic hours, fosters self-directed and motivated learning journeys beyond the confines of traditional classrooms (Yunus et al., 2019). This accessibility resonates with established literature affirming the transformative potential of mobile learning in higher education (Jeong, 2022; Hashim, 2018). Through comprehensive contextualization, the theme of "Accessibility" underscores the profound impact of mobile applications in empowering educators and students, fostering lifelong learning, and reshaping education in the digital age.

**Limitations and Recommendations**

This study was carried out, from educators’ perspective, to explore the need for creating a mobile module for synthesis writing which looked into specific samples with specific backgrounds. The limitation lies in transferability. Also, the respondents were from a defence university in Malaysia; hence the sample might not represent the whole population of universities in Malaysia. However, it is worth noting that the results may offer insights into the landscape of...
21st-century learning, particularly in the post-pandemic era, where digital approaches to education have gained prominence.

Future endeavours should include a more diverse sample from different types of universities to understand different education settings better. In terms of methodology, this research is qualitative, providing in-depth insight but lacking the statistical rigour associated with quantitative data. Future research can incorporate a mixed-method approach for a more comprehensive and statistically robust perspective. Despite the limitations, this study has its strengths. This study looks at the possibility of incorporating a digital approach in teaching and learning after the global pandemic altered education norms. It also provides evidence that educators have preferences in teaching via a mobile application, which is valuable when designing and developing feasible mobile applications.

Contributions

A significant contribution of this study points towards the language policy aspect. Synthesis writing is an essential skill that students must acquire to excel in universities (Vandermeulen et al., 2023; Luna et al., 2022; Van Ockenburg et al., 2019). In regards to this aspect, policymakers could look into introducing synthesis writing courses that students can access throughout their studies at the university. The findings from this study are one of the earliest preliminary studies to look into ESL, synthesis writing and mobile integration. These findings provide an overview of the needs in teaching synthesis writing from the perspective of integrating the digital approach (mobile application). Such findings are significant for mobile application designers, English language educators, and course designers. Future research work may design and develop a mobile app to enhance students' synthesis writing skills based on the educators' perspectives. Future research may also explore the students’ views on the need to develop a mobile app for synthesis writing.

Conclusion

This study aims to address an important gap in the current literature by exploring the requirement for developing a mobile application module designed for teaching synthesis writing, particularly from the perspective of educators within a defense university in Malaysia. The importance of synthesis writing includes the fulfilment of university requirements and the avoidance of plagiarism. The ability to write synthesis essays is essential at the university level because students must write with a specific style to adhere to the university's written works. Results from the interview concurred with the literature that university students need the skills to write synthesis essays to fulfil university requirements. These skills are essential to avoid plagiarism, a misconduct that has been rapidly permeating tertiary education after the spread of COVID-19. The challenges in teaching synthesis writing concur with those outlined by literature, which revolves around the complexity of the writing process when writing synthesis essays (select, organize, connect). Apart from the nature of the writing process, poor language proficiency is also a
significant hindrance for students to acquire such skills. The learning strategies used by the defence university educators involve collaborative work, explicit instruction, corrective feedback, and extensive practices, which can be conveniently done via technology. It is important to note that based on the interview findings, the incorporation of technology can enhance the learning of synthesis writing. The utilization of this tool has been explored extensively as the pandemic impacted teaching and learning worldwide.

As the pandemic was instrumental in shifting teaching and learning to digital platforms, the defence university educators believe that a mobile application should be incorporated to teach synthesis writing. This move is supported because a mobile application can make learning more convenient and accessible, which are great traits for teaching and learning. In a global world where learning has become more accessible, the incorporation of mobile applications is deemed a necessity as teaching and learning support, as it makes learning more convenient and accessible. Using digital approaches can promote motivation, autonomous learning and self-directed learning outside traditional classroom settings. Educators and students are more than ready to teach and learn using digital approaches, including mobile applications.

Implications

Based on this research, there are several significant implications for stakeholders. Institutions and educational technology developers should prioritize investment in mobile app design and development to enhance synthesis writing skills. These applications should prioritize usability and accessibility while offering features that facilitate information selection, organization, and connection from various sources. Equipping educators with the necessary training to effectively integrate these tools into their teaching methods is crucial. Furthermore, curriculum revision should embrace mobile app-based learning, fostering comprehensive learning experiences incorporating synthesis writing skills.

Educators should stress the importance of mobile app-supported synthesis writing to students, fostering engagement and skill development. Future research should concentrate on designing and evaluating mobile applications for students’ synthesis writing skills, considering long-term impact and learning outcomes. Exploring student perspectives on app necessity and usability will refine design and implementation. These findings, though context-specific, bear relevance to the global digital learning shift, encouraging institutions worldwide to embrace mobile applications as valuable tools for enhancing education.

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Conflicts of Interest

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A Digital Approach to Teach Synthesis Writing

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