



Digital Multimodal Composing: Inovasi Pembelajaran English for Computer Science di STIKOM Tunas Bangsa

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ABSTRAK

Penelitian ini mengeksplorasi penerapan Digital Multimodal Composing (DMC) sebagai pendekatan pedagogis inovatif dalam pembelajaran English for Computer Science di STIKOM Tunas Bangsa. Di era transformasi digital dan kurikulum Merdeka Belajar, integrasi literasi multimodal dalam pembelajaran bahasa Inggris menjadi sangat penting untuk meningkatkan kompetensi komunikatif serta keterampilan digital mahasiswa. Penelitian ini menggunakan pendekatan mixed-method, yang menggabungkan data kuantitatif dari hasil belajar mahasiswa dan data kualitatif dari wawancara serta observasi kelas. Hasil penelitian menunjukkan bahwa DMC secara signifikan meningkatkan keterlibatan, kreativitas, dan kemampuan berbahasa mahasiswa, khususnya pada keterampilan membaca dan menulis yang relevan dengan konteks ilmu komputer. Selain itu, mahasiswa menunjukkan peningkatan motivasi dan kemandirian belajar melalui tugas-tugas multimodal seperti digital storytelling, presentasi video, dan produksi media interaktif. Penelitian ini juga mengidentifikasi beberapa tantangan, seperti keterbatasan teknologi dan perbedaan tingkat literasi digital antar mahasiswa. Namun, tantangan tersebut dapat diatasi melalui pembelajaran kolaboratif dan bimbingan yang terarah. Penelitian ini menyimpulkan bahwa Digital Multimodal Composing merupakan pendekatan yang efektif dan transformatif untuk pembelajaran English for Computer Science, serta sejalan dengan tren pendidikan global dan reformasi kurikulum di Indonesia.

ABSTRACT

This study explores the implementation of Digital Multimodal Composing (DMC) as an innovative pedagogical approach in teaching English for Computer Science at STIKOM Tunas Bangsa. In the era of digital transformation and Merdeka Belajar curriculum, integrating multimodal literacy into English language learning is essential to enhance students' communicative competence and digital skills. This research employs a mixed-method approach, combining quantitative data from students' performance and qualitative data from interviews and classroom observations. The findings reveal that DMC significantly improves students' engagement, creativity, and language proficiency, particularly in reading and writing skills relevant to computer science contexts. Furthermore, students demonstrate increased motivation and autonomy in learning through multimodal tasks such as digital storytelling, video presentations, and interactive media production. The study also identifies challenges including technological limitations and varying levels of digital literacy among students. However, these challenges are mitigated through collaborative learning and guided instruction. The research concludes that Digital Multimodal Composing is an effective and transformative approach for English for Computer Science, aligning with global educational trends and the Indonesian curriculum reform.

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1. INTRODUCTION

The rapid advancement of digital technology has fundamentally reshaped educational practices across the globe, including in the field of English language teaching. In the 21st century, language learning is no longer limited to mastering grammar and vocabulary; instead, it requires learners to develop a wide range of competencies, including digital literacy, critical thinking, and multimodal communication skills. This shift is particularly relevant in English as a Foreign Language (EFL) contexts, where learners must be equipped to communicate effectively in increasingly digital and globalized environments (Jiang L, Yu S, 2020).

In Indonesia, educational reform through the *Merdeka Belajar* policy emphasizes student-centered learning, flexibility, and innovation in teaching practices. This policy encourages educators to adopt approaches that foster creativity, autonomy, and real-world problem-solving skills (Andrea J, Sakinah F, 2024). Furthermore, comparisons with international education systems highlight the importance of integrating technology and learner independence into the curriculum, as seen in countries such as Finland (Putra IED, Rusdinal R, Ananda A, 2023). These developments underscore the urgency of transforming traditional language teaching methods into more dynamic and relevant practices.

One promising approach that aligns with these demands is Digital Multimodal Composing (DMC). DMC refers to the process of creating meaning through the integration of multiple modes, including written text, images, audio, video, and interactive digital elements (Li M, 2021). Unlike conventional writing tasks, DMC enables learners to express ideas more creatively and effectively by utilizing various semiotic resources. Research has demonstrated that DMC not only enhances students' language proficiency but also supports identity construction and engagement in second language learning (Jiang L, 2021); (Yu S, Di Zhang E, 2024).

The integration of DMC is closely related to the concept of multiliteracies, which emphasizes the importance of diverse forms of communication in contemporary society (K., 2023). Multiliteracies pedagogy encourages learners to become active producers of knowledge rather than passive recipients. In this context, digital literacy plays a crucial role, as students must be able to access, evaluate, and create digital content effectively (Afifah L, Indriwardhani SP, Retnantiti S, 2023). Previous studies have shown that the use of digital tools and multimodal texts can significantly improve learners' comprehension and motivation (Wang D, 2022); (Lestari AD, Safitri W, Nurcholis IA, 2024).

In the context of higher education, particularly in computer science programs, the need for integrating language learning with digital competencies becomes even more critical. English for Computer Science is a specialized field that requires students to understand technical documentation, communicate ideas clearly, and collaborate in digital environments. Therefore, traditional teaching approaches may not sufficiently address these needs. Integrating DMC into English for Computer Science courses offers a meaningful way to bridge the gap between language learning and students' disciplinary knowledge (Wahyuni DS, Rozimela Y, Ardi H, 2024).

Moreover, motivation and engagement are key factors influencing the success of language learning. Studies have indicated that digital multimodal tasks can significantly enhance learners' motivation by providing authentic and meaningful learning experiences (Ayaz AD, 2021). The concept of Directed Motivational Currents (DMCs) further explains how sustained engagement can be achieved through goal-oriented and project-based learning activities (Poupore G., 2024); (Ismail X, 2021). In this regard, DMC-based instruction aligns well with the implementation of multimodal projects in the classroom.

Despite the growing body of research on Digital Multimodal Composing, its application in Indonesian higher education, particularly in English for Computer Science courses, remains limited. Many educators still rely on conventional teaching methods that do not fully utilize the potential of digital technologies. Additionally, challenges such as limited resources, lack of training, and varying levels of digital literacy among students often hinder the effective implementation of DMC (Trisanti N, Sukyandi D, 2022).

Given these considerations, this study aims to explore the implementation of Digital Multimodal Composing as an innovative pedagogical approach in teaching English for Computer Science at STIKOM Tunas Bangsa. Specifically, this research seeks to:

1. Examine the impact of DMC on students' language proficiency, particularly in reading and writing skills.
2. Investigate students' engagement and motivation during multimodal learning activities.
3. Identify challenges and strategies in implementing DMC in the classroom.

By addressing these objectives, this study is expected to contribute to the development of more effective and innovative English language teaching practices in higher education, particularly in the context of digital transformation and curriculum reform in Indonesia.

2. LITERATURE REVIEW

2.1. Digital Multimodal Composing (DMC) in L2 Learning

Digital Multimodal Composing (DMC) refers to the process of creating meaning by integrating multiple modes such as text, images, audio, video, and digital design in communication. In the context of second language (L2) learning, DMC has emerged as an innovative pedagogical approach that expands traditional writing practices into more dynamic and interactive forms. According to (Jiang L, 2021), DMC enables learners to construct meaning through various semiotic resources, which enhances both linguistic and cognitive development. Similarly, (Li M, 2021) emphasizes that multimodal composing allows students to engage more deeply with language by combining verbal and non-verbal elements in meaningful ways.

Recent studies highlight that DMC not only improves language skills but also fosters creativity and critical thinking. (Jiang LG, 2024) propose that DMC should be integrated into L2 classrooms as part of a broader research agenda focusing on digital literacy and communication. Furthermore, (Yu S, Di Zhang E, 2024) argue that DMC bridges the gap between theory and practice in second language writing by providing authentic learning experiences. These perspectives indicate that DMC is a transformative approach that aligns with the demands of 21st-century education.

2.2. Multiliteracies and Digital Literacy in Language Education

The concept of multiliteracies emphasizes the importance of understanding and producing meaning across multiple modes and cultural contexts. (Lotherington H, 2011) argue that modern language education must move beyond traditional literacy to include digital and multimodal competencies. This shift reflects the increasing role of technology in communication and learning.

Digital literacy, as part of multiliteracies, involves the ability to use digital tools effectively for communication, collaboration, and information processing. (Afifah L, Indriwardhani SP, Retnantiti S, 2023) found that multimodal texts significantly improve foreign language learners' literacy by making learning more engaging and contextually relevant. Similarly, (Wang D, 2022) highlight that multimodal pedagogies promote active learning and enable students to develop both language and technological skills simultaneously.

In the Indonesian context, the integration of digital literacy is closely related to educational reforms such as the Merdeka Belajar curriculum, which encourages student-centered and technology-based learning (Andrea J, Sakinah F, 2024). Therefore, incorporating DMC into English learning is highly relevant to current educational policies and practices.

2.3. Motivation, Engagement, and Self-Directed Learning

Motivation and engagement are key factors in successful language learning. DMC has been shown to enhance both by providing meaningful and creative learning experiences. (Ayaz AD, 2021) found that DMC positively influences learners' motivation, particularly through the concept of Directed Motivational Currents (DMCs), where students experience sustained motivation during project-based tasks.

(K., 2023) further explains that multimodal learning supports self-directed learning by allowing students to take control of their learning process, explore digital resources, and create personalized outputs. This aligns with the findings of (Ismail X, 2021), who emphasize the role of motivation in autonomous language learning.

In addition, project-based learning combined with DMC encourages active participation and collaboration. (Poupore G., 2024) states that learners become more engaged when they are involved in meaningful tasks that simulate real-world contexts. Thus, DMC contributes not only to language acquisition but also to learner autonomy and engagement.

2.4. DMC in Classroom Practice and Pedagogical Challenges

The implementation of DMC in classroom settings requires careful planning and adaptation. (Belcher DD., 2017) highlights the role of teachers as facilitators who guide students in designing and producing multimodal texts. Similarly, (Jiang L, Yu S, 2022) identify several challenges in implementing DMC, including limited technological resources, varying levels of digital literacy, and the need for teacher training.

(Trisanti N, Sukyandi D, 2022) found that while DMC is effective in enhancing students' participation and creativity, it also requires sufficient time and support to be successfully implemented. Moreover, (Widyahening CET, Handayani S, Al Hakim L, Sari Al, 2024) note that English teachers must continuously adapt to technological trends to remain effective in modern classrooms.

Despite these challenges, the benefits of DMC outweigh its limitations. With proper support, infrastructure, and pedagogical strategies, DMC can be successfully integrated into language learning environments.

2.5. English for Computer Science and Professional Communication

English for Computer Science is a branch of English for Specific Purposes (ESP) that focuses on developing language skills relevant to the field of information technology. (Wahyuni DS, Rozimela Y, Ardi H, 2024) emphasize that English learning in computer science should integrate disciplinary knowledge with communication skills to prepare students for global professional environments.

DMC plays an important role in this context by providing authentic tasks that simulate real-world communication, such as writing technical reports, creating tutorials, and presenting digital content. These activities help students develop professional communication skills, including clarity, accuracy, and audience awareness.

Furthermore, (Yakin A, Khang A, Muthmainnah M, Elngar AA, Siripipatthanakul S, 2025) highlight the growing importance of digital communication in the era of advanced technologies such as robotics and artificial intelligence. Therefore, integrating DMC into English for Computer Science is essential to equip students with the skills needed in the digital workforce.

2.6. Summary of Literature Review

In summary, the literature indicates that Digital Multimodal Composing is a powerful approach in L2 learning that integrates language skills with digital literacy, creativity, and collaboration. It supports the principles of multiliteracies, enhances motivation and engagement, and prepares students for professional communication in digital environments. Although challenges exist, DMC remains a relevant and effective strategy for modern language education, particularly in the context of English for Computer Science.

3. RESEARCH METHOD

3.1. Research Design

This study adopted a **mixed-methods approach** using a **sequential explanatory design**, in which quantitative data were collected and analyzed first, followed by qualitative data to explain and enrich the statistical findings. This design was considered appropriate because the study aimed not only to measure the effectiveness of Digital Multimodal Composing (DMC) in improving students' English achievement, but also to understand the learning experiences, attitudes, and challenges encountered during the implementation process (Creswell, 2014).

The integration of quantitative and qualitative methods allowed the researcher to obtain a holistic perspective on how DMC functions as an instructional innovation in the context of **English for Computer Science**. The quantitative phase generated measurable evidence of changes in students' language proficiency, engagement, and motivation, while the qualitative phase provided deeper insights into why such changes occurred and how participants interpreted their experiences.

The study was conducted as **classroom-based pedagogical research**, where the researcher observed the natural implementation of teaching innovation in a real educational setting rather than under laboratory conditions. Therefore, the findings reflect authentic classroom practices and are relevant for practical application in higher education institutions.

3.2. Research Context

The research took place at **STIKOM Tunas Bangsa**, a private higher education institution focusing on information technology, computer science, and digital innovation. As a technology-oriented institution, STIKOM Tunas Bangsa provides an ideal environment for integrating digital pedagogy into English language instruction.

The course selected for this study was **English for Computer Science**, a compulsory subject designed to equip students with English skills relevant to their discipline. The course emphasizes reading technical materials, understanding digital terminology, presenting ideas, writing reports, and communicating in professional IT contexts.

Traditionally, English classes in similar contexts tend to rely heavily on textbook-based instruction, grammar exercises, and conventional presentations. However, such methods may not sufficiently address students' needs in the digital era, where communication increasingly occurs through multimedia platforms. Therefore, implementing DMC was expected to bridge the gap between language learning and students' future professional demands.

3.3. Participants

The participants of this study consisted of **40 undergraduate students** from the Computer Science program who were enrolled in the English for Computer Science course during the 2025/2026 academic year. The participants were selected through **purposive sampling**, as they met the criteria of being active students taking the course and having regular access to digital devices such as laptops or smartphones.

The participants represented diverse academic backgrounds within computer science, including software engineering, information systems, and network technology. Their English proficiency levels ranged from beginner to intermediate based on placement records and initial classroom observation.

In addition, **two English lecturers** participated in the study as key informants. Both lecturers had prior teaching experience in ESP (English for Specific Purposes) courses and were responsible for facilitating DMC-based learning activities. Their involvement was essential in providing professional reflections on instructional planning, classroom management, and student responses.

3.4. Research Variables

This study used three types of variables: independent, dependent, and supporting variables. The **independent variable** was the implementation of **Digital Multimodal Composing (DMC)** as a teaching strategy in the English for Computer Science course. The **dependent variables** were students' **English proficiency** (reading, writing, and vocabulary), **learning motivation**, **classroom engagement**, and **digital literacy skills**. These variables were expected to improve after the use of DMC. The **supporting variables** included students' prior English ability, digital skills, access to devices and internet, and collaboration skills. These factors could influence the results of the study.

3.5. Research Instruments

To ensure comprehensive data collection, multiple instruments were employed.

A. Pre-test and Post-test

The pre-test and post-test were designed to measure students' English achievement before and after the implementation of DMC. Both tests contained equivalent levels of difficulty and assessed three main competencies:

1. **Reading Comprehension**
Students read computer science-related texts such as software manuals, programming tutorials, and technology articles, then answered comprehension questions.
2. **Writing Skills**
Students were asked to write short explanations, technical descriptions, or procedural texts related to computing topics.
3. **Vocabulary Mastery**
Students completed tasks involving technical terminology commonly used in computer science. The scoring rubric covered accuracy, coherence, grammar, vocabulary usage, and content relevance.

B. Questionnaire

A structured questionnaire was administered at the end of the semester to examine students' perceptions of DMC. The instrument used a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). The questionnaire consisted of four dimensions:

1. **Motivation**
Example item: "Digital projects make me more interested in learning English."
2. **Engagement**
Example item: "I actively participated during multimodal tasks."
3. **Perceived Usefulness**
Example item: "The activities help me understand English in computer science contexts."
4. **Digital Literacy Development**
Example item: "I improved my ability to use digital tools for communication."

The questionnaire was pilot-tested to ensure clarity and internal consistency.

C. Semi-Structured Interviews

Semi-structured interviews were conducted with ten students selected based on varying achievement levels (high, medium, low) and with two lecturers. This sampling ensured diverse perspectives. Interview questions explored:

1. Feelings toward DMC activities
2. Perceived benefits and learning gains
3. Challenges in using technology

4. Collaboration experiences
5. Suggestions for improving future instruction

Each interview lasted approximately 20–30 minutes and was audio-recorded with participants' consent.

D. Classroom Observation

Non-participant classroom observations were conducted regularly during the semester. Observation sheets were used to record:

1. Frequency of student participation
2. Interaction patterns
3. Problem-solving behavior
4. Collaboration quality
5. Use of English during tasks
6. Use of digital applications and platforms

Observation data provided contextual evidence that complemented test scores and interview responses.

E. Document Analysis

The researcher also analyzed students' digital products, including:

1. Video presentations
2. Infographics
3. Digital posters
4. Slide presentations
5. Recorded tutorials
6. Reflective journals

These artifacts were examined to evaluate creativity, language use, multimodal integration, and relevance to computer science topics.

3.6. Treatment and Learning Activities

The intervention lasted for one semester (approximately 14 meetings). DMC activities were integrated into regular classroom instruction.

Week 1–2: Orientation Phase

Students were introduced to:

1. Concepts of multimodality
2. Examples of digital compositions
3. Basic digital tools (Canva, PowerPoint, CapCut, Google Slides, etc.)
4. Assessment criteria for multimodal projects

Students also completed the pre-test.

Week 3–6: Guided Practice

Students completed simple multimodal tasks individually or in pairs, such as:

1. Designing vocabulary posters
2. Recording short self-introduction videos
3. Creating illustrated summaries of technology articles

The lecturer modeled how to combine language with visual and audio elements effectively.

Week 7–11: Project-Based DMC Tasks

Students worked in groups on larger projects, such as:

1. Creating a video tutorial on coding basics
2. Designing an infographic on internet safety
3. Producing a presentation about emerging technologies
4. Developing a digital campaign about ethical AI use

These tasks encouraged authentic communication and teamwork.

Week 12–13: Presentation and Reflection

Students presented their projects to classmates. Peer feedback and lecturer comments were provided. Students then wrote reflective journals describing what they learned.

Week 14: Final Evaluation

Students completed the post-test and questionnaire, followed by interviews.

3.7. Data Analysis Techniques

The data in this study were analyzed using quantitative and qualitative techniques. Quantitative data from the pre-test, post-test, and questionnaire were analyzed using mean scores, percentages, and score improvement to measure students' progress in reading, writing, vocabulary, motivation, engagement, and digital literacy after the implementation of Digital Multimodal Composing (DMC).

Qualitative data from interviews, observations, reflective journals, and students' projects were analyzed using thematic analysis. The researcher transcribed, organized, and coded the data, then grouped similar responses into themes such as motivation, collaboration, creativity, and learning challenges.

To ensure credibility, triangulation was used by comparing findings from different data sources. Finally, all results were integrated to explain how DMC influenced students' learning outcomes in English for Computer Science.

3.8. Validity and Reliability

Validity and reliability were applied to ensure that the research instruments and findings were accurate and consistent. For validity, the pre-test, post-test, and questionnaire were designed based on the course objectives and reviewed by experts to ensure that they measured the intended skills and concepts. The questionnaire items were also based on relevant theories and previous studies.

For reliability, the questionnaire was tested before use, and unclear items were revised. The same scoring rubric was used for the pre-test and post-test, and all students completed the tests under similar conditions.

For qualitative data, trustworthiness was strengthened through triangulation, member checking, and clear documentation of the research process. These procedures helped ensure that the findings were credible and dependable.

3.9. Ethical Considerations

Ethical considerations were applied to protect the rights, privacy, and well-being of all participants. Before the study began, students and lecturers were informed about the purpose of the research, procedures, and data collection process. Their participation was voluntary, and informed consent was obtained from all participants. They also had the right to withdraw from the study at any time without negative consequences.

Confidentiality and anonymity were maintained by using codes or pseudonyms instead of real names. All data, including test results, questionnaires, interviews, and observation notes, were stored securely and used only for academic purposes.

The researcher also ensured that participation in the study did not affect students' grades or lecturers' evaluations. In addition, all findings were reported honestly and all sources were properly cited to maintain academic integrity.

3.10. Limitations of the Methodology

This study has several methodological limitations that should be considered when interpreting the findings. First, the research involved a relatively small sample of 40 students from one institution, so the results may not be fully generalizable to other universities or different educational contexts. Second, the study was conducted within one semester, which may not be sufficient to measure the long-term impact of Digital Multimodal Composing on students' language development and digital literacy. Third, participants had different levels of English proficiency and digital skills at the beginning of the study, which may have influenced their performance during the intervention. Finally, technical factors such as internet connectivity, device availability, and software familiarity occasionally affected the implementation of multimodal tasks. Despite these limitations, the study still provides valuable insights into the potential of DMC in English for Computer Science learning.

4. RESULTS AND DISCUSSION

4.1. Improvement of Students' English Proficiency

The quantitative findings showed that students' post-test scores were higher than their pre-test scores after the implementation of Digital Multimodal Composing (DMC). This indicates that students improved their reading comprehension, writing skills, and vocabulary related to computer science topics. Through multimodal tasks, students were able to understand technical texts more easily and express ideas more clearly in written form. The use of text, visuals, audio, and video supported deeper comprehension and more meaningful language production. This finding is in line with (Jiang L, 2021), who state that DMC enhances language learning through richer meaning-making opportunities.

4.2. Students' Motivation and Engagement

The questionnaire results revealed that most students had positive attitudes toward the use of DMC in the classroom. They reported that learning activities became more interesting, interactive, and enjoyable. Students were more motivated to participate because the projects were relevant to their field of study and allowed them to use creativity. Classroom observation also showed that students were more active during discussions, presentations, and group tasks. This supports previous studies that digital multimodal tasks can increase learner motivation and engagement (Ayaz AD, 2021); (Poupore G., 2024).

4.3. Development of Collaboration and Creativity

The qualitative data showed that DMC activities encouraged students to work collaboratively and think creatively. During group projects, students shared ideas, divided responsibilities, and solved technical or language-related problems together. They also learned to present information in creative ways through videos, infographics, and digital presentations. This process helped students build teamwork skills and confidence in using English. Such findings reflect the principles of project-based learning and multiliteracies pedagogy (K., 2023).

4.4. Improvement of Digital Literacy Skills

Another important finding was the improvement of students' digital literacy. By completing multimodal projects, students became more familiar with various digital tools such as presentation software, video editing applications, and online collaboration platforms. They learned how to combine language content with digital media effectively. This skill is highly relevant for computer science students who will need to communicate in technology-rich environments. Therefore, DMC not only supported language learning but also prepared students for future academic and professional needs.

4.5. Challenges in Implementation

Despite the positive results, several challenges were identified during the implementation of DMC. Some students had limited experience in using digital tools, which affected the speed and quality of project completion. Technical problems such as unstable internet connection and limited access to devices also became obstacles. In addition, time management was sometimes difficult, especially for group assignments. However, these challenges were reduced through lecturer guidance, peer support, and continuous feedback throughout the learning process.

4.6. Overall Discussion

Overall, the findings demonstrate that Digital Multimodal Composing is an effective and innovative approach for teaching English for Computer Science at STIKOM Tunas Bangsa. It improves students' language proficiency, motivation, collaboration, creativity, and digital literacy. Although some challenges remain, the benefits of DMC outweigh the limitations. Therefore, DMC can be considered a relevant strategy for English learning in higher education, especially in technology-based institutions.

5. CONCLUSION

This study concludes that Digital Multimodal Composing (DMC) is an effective and innovative approach in teaching English for Computer Science at STIKOM Tunas Bangsa. The implementation of DMC successfully improved students' English proficiency, particularly in reading comprehension, writing skills, and vocabulary related to computer science topics. The use of multimodal elements such as text, images, audio, and video helped students understand technical content more easily and communicate their ideas more clearly.

In addition, DMC increased students' motivation and engagement in the learning process. Students showed greater interest and active participation because the learning activities were interactive, creative, and relevant to their academic field. The study also found that DMC promoted collaboration, creativity, and problem-solving skills through project-based tasks.

Another important contribution of DMC was the development of students' digital literacy. By using various digital tools and platforms, students gained practical skills that are valuable for their future academic and professional careers in computer science.

Although some challenges were found, such as limited digital skills, technical problems, and time management issues, these obstacles could be addressed through lecturer guidance, peer collaboration, and continuous support. Therefore, the benefits of DMC outweigh its limitations.

Overall, Digital Multimodal Composing can be recommended as a relevant pedagogical strategy for English learning in higher education, especially in technology-based institutions. Future studies are suggested

to involve larger samples, longer implementation periods, and the integration of emerging technologies such as artificial intelligence or virtual reality.

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Finally, the researcher hopes that this study will contribute to the development of innovative English language teaching, especially in the implementation of Digital Multimodal Composing in higher education.

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