



The Effect of Microlearning Integration in Digital Platforms on Student Engagement: An Experimental Study in Higher Education

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ABSTRAK

Kemajuan teknologi digital yang pesat telah membawa perubahan signifikan di berbagai sektor, termasuk bidang pendidikan. Transformasi ini berdampak besar pada cara penyampaian materi pembelajaran dan interaksi antara pendidik dan siswa, dengan semakin bergantungnya platform digital. Penelitian ini menyelidiki dampak pengintegrasian pembelajaran mikro ke dalam platform digital terhadap keterlibatan mahasiswa di pendidikan tinggi. Integrasi pembelajaran mikro, yang membagi konten menjadi unit-unit kecil yang mudah dicerna, diyakini dapat meningkatkan partisipasi, motivasi, dan retensi mahasiswa terhadap materi pembelajaran. Penelitian ini melibatkan 80 mahasiswa dari tiga perguruan tinggi. Penelitian ini mengukur pengaruh pembelajaran microlearning melalui platform digital terhadap keterlibatan siswa. Hasil analisis dengan paired sample t-test menunjukkan peningkatan keterlibatan yang signifikan pada kelompok eksperimen, dengan rata-rata skor meningkat dari 65,4 sebelum intervensi menjadi 78,3 setelah intervensi ($p < 0,05$). Sebaliknya, kelompok kontrol tidak menunjukkan peningkatan signifikan, dengan rata-rata skor 64,9 sebelum dan 66,1 setelah intervensi ($p > 0,05$). Temuan ini menunjukkan bahwa penggunaan platform microlearning dapat meningkatkan keterlibatan siswa secara signifikan. Selain itu, penelitian ini memberikan rekomendasi praktis bagi para pendidik dan institusi tentang pengintegrasian pembelajaran mikro untuk menciptakan pengalaman belajar yang lebih interaktif dan menarik, yang menjawab kebutuhan mahasiswa kontemporer di era digital.

ABSTRACT

The rapid advancement of digital technology has brought about significant changes across various sectors, including the field of education. This transformation has profoundly impacted the ways in which learning materials are delivered and the interactions between educators and students, with an increasing reliance on digital platforms. This study aims to analyze the impact of integrating microlearning into digital platforms on student engagement in higher education. Microlearning integration, which breaks content into small, digestible units, is believed to enhance student participation, motivation, and retention of learning material. The study involved 80 students from three universities in Probolinggo, Indonesia. It measures the impact of microlearning through digital platforms on student engagement. The paired sample t-test analysis revealed a significant increase in engagement in the experimental group, with the average score rising from 65.4 before the intervention to 78.3 after the intervention ($p < 0.05$). In contrast, the control group showed no significant improvement, with the average score increasing from 64.9 before the intervention to 66.1 after ($p > 0.05$). These findings suggest that the use of microlearning platforms can significantly enhance student engagement. Additionally, the study provides practical recommendations for educators and institutions on integrating microlearning to create more interactive and engaging learning experiences that meet the needs of contemporary students in the digital age.

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1. INTRODUCTION

The rapid advancement of digital technology has brought about significant changes across various sectors, including the field of education. This transformation has profoundly impacted the ways in which learning materials are delivered and the interactions between educators and students, with an increasing reliance on digital platforms. One approach that has garnered considerable attention in higher education is microlearning, a method of instruction that divides content into small, easily digestible units that can be accessed through digital platforms (Alauddin et al., 2025; Javorcik et al., 2023). Microlearning presents new opportunities to enhance student engagement in the learning process, considering its flexibility and alignment with individual learning preferences in the digital age. In this digital era, the utilization of digital platforms for educational purposes has become increasingly relevant and crucial in supporting students to achieve optimal learning outcomes (Auf, 2024; Eberhardt et al., 2025). Microlearning, often delivered in the form of short videos, interactive modules, or brief quizzes, allows students to access learning material more efficiently, at any time and from any location, according to their needs and preferences (Javorcik et al., 2023; Newnham & Dutt, 2023). With the growing use of mobile devices and

educational apps, the integration of microlearning into digital platforms has become an ideal choice to boost student engagement, which, in turn, can positively influence learning outcomes. This trend is driven by the fact that students' learning styles are increasingly intertwined with digital technology, facilitating their ability to access information and educational resources more flexibly (Auf, 2024; Kryzhanivska et al., 2025). Despite the widespread adoption of digital learning platforms in higher education, many students are still unable to fully leverage these platforms to their advantage (Alawamleh et al., 2022; Suvandy et al., 2024). Challenges such as low active engagement levels and high dropout rates are often attributed to boredom or fatigue caused by lengthy, non-interactive, or poorly structured learning materials (Binmahboob, 2020; Liang & Bautista, 2025). Therefore, there is a pressing need for innovative instructional methods that can enhance student engagement, which directly affects learning outcomes and reduces boredom, while also improving retention of learning material during online courses.

Previous research has shown that integrating microlearning into digital platforms can significantly increase student motivation and engagement (ALshammari, 2024). Microlearning allows students to interact with content in small, manageable chunks that are easier to absorb and provides them with more control over the pace and timing of their learning (Balasundaram et al., 2024; Hesse et al., 2019). However, these studies have generally focused on testing the effectiveness of microlearning in a broader sense, without specifically examining how this method integrates into existing digital platforms used in higher education. Therefore, this study aims to provide a deeper understanding of how microlearning can be effectively integrated into the digital platforms already in use by students in higher education institutions. This research is grounded in several learning theories and concepts that are relevant to the issues at hand and provide clear direction for data analysis. One of the key theories underpinning this research is constructivism, which posits that the most effective learning occurs when students are actively involved in the learning process and build their own understanding through experience (Jeong, 2016; Noriega & Ramos, 2022). In the context of microlearning, this theory is pertinent because microlearning is designed to give students the opportunity to engage with content actively and repeatedly, aligning with the principles of constructivist learning. Microlearning enhances student engagement in the learning process by encouraging active participation, which in turn helps students construct a deeper understanding of the material (Al-Zahrani, 2024; Erdur Harman & Alper, 2024).

Prior studies that are relevant to the current research have shown that microlearning can increase student motivation and engagement. Previous study found that the use of microlearning increased students' intrinsic motivation because it provided content that was more accessible and engaging (ALshammari, 2024). Other study demonstrated that microlearning enhanced information retention because it allowed students to process material gradually, reducing the likelihood of cognitive overload (Ghasia & Rutatola, 2021). Despite these promising findings, there is still limited research on the integration of microlearning into the specific digital platforms used in higher education (Balasundaram et al., 2024; Jupe et al., 2025). Most of the existing studies focus on the general effectiveness of microlearning without exploring the challenges or opportunities associated with integrating it into existing digital learning platforms. The primary issue that this study addresses is the low level of student engagement in digital learning platforms. Several factors contribute to this lack of engagement, including ineffective learning content that is too long, poorly structured, or lacks interactivity (Balasundaram et al., 2024; Prijanto & Kock, 2021). As a result, students often experience boredom and a lack of motivation to engage with the learning materials. To address these challenges, there is a need for more effective solutions to optimize the use of digital platforms in enhancing student engagement. One promising approach is the integration of microlearning, which has been shown in previous studies to improve student engagement and retention (Alauddin et al., 2025; Espanola & Ouano, 2024). To address the issue of low student engagement, this study proposes the solution of integrating microlearning into the existing digital platforms used in higher education institutions. This integration is expected to enable students to access information more quickly and efficiently, while also increasing their engagement in the learning process. By breaking content into smaller, more digestible units, microlearning can help reduce student boredom, give students greater control over their study time, and improve information retention (Capuno et al., 2019; ten Cate et al., 2023). This approach is expected to make learning more accessible and engaging, thus enhancing students' overall learning experience (Hava, 2019; ten Cate et al., 2023).

This research aims to analyze the impact of integrating microlearning into digital platforms on student engagement in higher education, focusing on aspects such as active participation, interaction with content, and retention. With the increasing reliance on digital technologies in education, it is essential to explore innovative learning methods that cater to the evolving needs of contemporary students. Microlearning, a method that delivers content in small, digestible units, has gained significant attention due to its potential to enhance student engagement. The study will also identify specific factors influencing the effectiveness of microlearning and analyze how these factors contribute to student engagement. By providing insights into these factors, the research will offer valuable recommendations for educators and educational institutions on how to effectively implement microlearning strategies in digital learning environments. Ultimately, the findings are expected to contribute

significantly to the development of more effective digital learning methods that align with the needs of modern students, fostering more interactive, engaging, and personalized learning experiences in the digital age.

2. METHOD

This study employs a quasi-experimental method using a pretest-posttest control group design. The design involves two groups: the experimental group, which receives the intervention of integrating microlearning into a digital platform, and the control group, which does not receive any intervention. This research was conducted during one academic semester (6 months) in 2024 at three universities in Probolinggo, Indonesia that have access to digital learning platforms, such as Learning Management System (LMS). A quasi-experimental approach was chosen as it allowed for testing the impact of microlearning in a real classroom setting without requiring random assignment. This design enabled a practical comparison between experimental and control groups, offering insights into how microlearning affects student engagement (Erdur Harman & Alper, 2024; Isibika et al., 2023). Unlike traditional experiments, quasi-experimental research accounts for natural variations among students by selecting groups based on specific criteria rather than randomization. In this study, students were grouped based on their enrollment in courses that used digital platforms, ensuring similar prior exposure to digital learning tools. The pre-test and post-test measurements helped assess changes in engagement, providing a clear understanding of microlearning's effectiveness (Balasundaram et al., 2024; Hesse et al., 2019).

There were 80 third and fifth semester students enrolled in courses related to educational technology selected as participants. Students were divided into two groups, namely the experimental group of 40 students and the control group of 40 students. Purposive sampling was carried out to select students who met the criteria as active users of digital platforms and were willing to participate in the research for one full semester. This selection ensured that participants had sufficient experience in using technology for learning purposes, which was very important for the purpose of the research. The instruments used was adapted from the Student Engagement Scale developed by Erdur Harman & Alper (2024), which consists of three dimensions of engagement: cognitive, affective, and behavioral engagement. Each dimension was measured using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). The student engagement questionnaire was designed to measure student engagement comprehensively based on three main dimensions: cognitive, affective, and behavioral. Student involvement questionnaire outline is show in [Table 1](#).

Table 1. Student Involvement Questionnaire Outline

Dimensions	Indicator	Amount	Questionnaire Properties
Cognitive	Understanding of the material	2	+
	Critical and analytical thinking skills	3	+
	Use of effective learning strategies	2	+
	Persistence in completing tasks	2	+
Affective	Interest and attraction to the material	2	+
	Positive attitude in the learning process	2	-
	Intrinsic motivation to learn	2	+
	Satisfaction in participating in learning	2	+
Behavior	Active participation in discussions	3	+
	Punctuality in attending classes	2	+
	Involvement in collaboration	2	-
	Use of digital platforms	3	+

This instrument is used to observe the level of student engagement during the learning process, including participation in discussions, interaction with the lecturer and other students, as well as the use of digital platforms. Observations of student engagement are carried out systematically and measurably, covering various aspects of engagement in learning, both directly in class and through digital platforms. The instrument is show in [Table 2](#).

Table 2. Student Involvement Questionnaire Outline

Dimensions	Indicator	Description
Participation	Activeness in expressing opinions	Students actively express their opinions in class discussions.
	Frequency of asking or answering questions	Students often ask or answer questions asked by lecturers or other students.

Dimensions	Indicator	Description
Interaction	Initiative to communicate with lecturers	Students take the initiative to communicate with lecturers regarding learning materials.
	Involvement in discussions led by lecturers	Students actively participate in discussions led by lecturers.
	Collaborate with classmates in group assignments	Students are actively involved in group work or collaborative assignments.
	Provide feedback or help to friends	Students provide feedback or assistance to classmates in learning
Digital Platforms	Active use of interactive features on digital platforms	Students actively use features such as forums, quizzes, or chat on digital platforms.
	Timely uploading of assignments through digital platforms	Students upload assignments or complete learning activities through digital platforms on time.
	Use of additional materials or digital content	Students use additional content such as videos or articles on digital platforms to deepen their understanding.

The validity of the questionnaire was tested using content validity by involving experts in the field of learning technology, while reliability was tested using the Cronbach Alpha coefficient to ensure instrument consistency. Questionnaires that have a Cronbach Alpha value above 0.7 are considered reliable. evidence of validity and reliability estimation is show in [Table 3](#).

Table 3. Evidence Of Validity And Reliability Estimation

Type of Validity / Reliabilitys	Testing Method	Valid / Reliabel Indicator	Test Results	Description
Validity of Content	Expert judgment on questionnaire items	Each questionnaire item is relevant to the dimension being measured.	Accepted / Not Accepted	Involve 2-3 experts in the field of learning technology and psychometrics.
Construct Validity	Confirmatory Factor Analysis (CFA)	Each indicator contains a loading factor > 0.50	Loading factor meets / does not meet	Used to ensure that each indicator loads the appropriate factors.
Reliability	Cronbach's Alpha Coefficient	Cronbach's Alpha value ≥ 0.70	Alpha Value	Used to measure the internal consistency of the questionnaire.
Criteria Validity (optional)	Correlation between questionnaire scores and relevant external criteria	Significant relationship between questionnaire scores and external criteria	Significant / Not significant	Used when there are appropriate comparative criteria, such as academic results or standardized tests.

Data collection techniques in this study were carried out by utilizing questionnaires, observations, and interviews to obtain information related to student engagement in microlearning-based learning on digital platforms. The questionnaire was used as the main instrument to collect quantitative data on student engagement. This questionnaire consists of closed statements measured using a 5-point Likert scale, covering three dimensions of engagement, namely cognitive, affective, and behavioral. The questionnaire was filled out online, allowing for more flexible and efficient participation. Data from this questionnaire provides an overview of the level of student engagement from their own perspective. In addition to the questionnaire, observations were conducted to obtain data on student engagement directly during the learning process. Observations were conducted using observation sheets that recorded student participation in discussions, interactions with lecturers and classmates, and the use of digital platforms in learning activities. This observation data provides a more objective view of student engagement behavior during class. To complement the quantitative data and observations, semi-structured interviews were conducted with several students and lecturers to dig deeper into their views on the effectiveness of microlearning in increasing student engagement, as well as the obstacles that might be faced. Through these three data collection techniques, it is hoped that the research can provide a more comprehensive and in-depth analysis of student involvement in microlearning-based learning on digital platforms.

The data were analyzed using paired sample t-test statistical test to measure the difference in student engagement scores before and after the intervention in the experimental and control groups. In addition, independent sample t-test was used to compare the engagement results between the experimental and control groups. For qualitative data obtained from interviews, analysis was conducted using the thematic analysis method, where patterns of student engagement during microlearning were identified and categorized into themes relevant to the research objectives. To ensure the validity and consistency of the research results, data triangulation techniques were used by combining the results of questionnaires, observations, and interviews. In addition, internal validity was maintained through strict supervision during the implementation of the intervention and providing guidance to observer researchers to avoid bias. With this procedure, the study is expected to provide valid and reliable results regarding the influence of microlearning integration in digital platforms on student engagement.

3. RESULT AND DISCUSSION

Result

This study measures the effect of microlearning-based learning through a digital platform on student engagement. The results of the analysis using paired sample t-test showed a significant difference in student engagement before and after the intervention in the experimental group. The average student engagement score in the experimental group increased from 65.4 before the intervention to 78.3 after the intervention, with a p value <0.05, as shown in Table 4. Meanwhile, in the control group, there was no significant increase with an average engagement score of 64.9 before the intervention and 66.1 after the intervention ($p > 0.05$). These results indicate that the use of the microlearning platform significantly increases student engagement.

Table 4. Comparison of Student Engagement Before and after Intervention between Experimental and Control Groups

Group	N	Average Before (Mean $\pm$ SD)	Average After (Mean $\pm$ SD)	P-Value Before vs. After	P-Value Between Groups
Experiment	30	65.4 $\pm$ 8.2	78.3 $\pm$ 7.1	< 0.05	< 0.05
Control	30	64.9 $\pm$ 7.8	66.1 $\pm$ 7.5	> 0.05	> 0.05

Table 4 provides a comparison of student engagement before and after the intervention for the experimental and control groups, as well as a comparison between the two groups. In the experimental group, the mean engagement score before the intervention was 65.4 (SD = 8.2), and after the intervention, it increased to 78.3 (SD = 7.1). The p-value for the comparison between the pre- and post-intervention scores was < 0.05, indicating a significant increase in student engagement because of the microlearning-based intervention. Furthermore, the p-value for the comparison between the experimental and control groups after the intervention was also < 0.05, indicating a significant difference in engagement between the two groups. On the other hand, in the control group, the mean engagement score before the intervention was 64.9 (SD = 7.8), and after the intervention, it only slightly increased to 66.1 (SD = 7.5). The p-value for the comparison before and after was > 0.05, indicating no significant change in engagement in the control group. Similarly, the p-value for the comparison between the experimental and control groups after the intervention was > 0.05, indicating that the control group did not show a significant increase in engagement compared to the experimental group. Students reported that the concise and structured microlearning format helped them understand concepts better. The material was presented in short videos and infographics, making it easier for them to absorb information without feeling overwhelmed. Findings of students' cognitive engagement is show in Table 5.

Table 5. Findings Of Students' Cognitive Engagement

Theme	Sub theme	Description Findings	Quotes
Cognitive Engagement	Concept	Microlearning helps students	"The material is not too long, so I can focus."
	Understanding	understand the material better	
	Solution to problem	Students are more independent in completing assignments	"I can immediately apply the material to my assignments."

Table 5 illustrates that microlearning not only facilitates better understanding of the material but also improves students' problem-solving skills by allowing them to apply what they learn directly to academic tasks. Student feedback indicates positive cognitive engagement, with short, focused learning sessions contributing to conceptual clarity and independent application of knowledge. Emotionally, students showed higher motivation in attending lectures after the implementation of microlearning. This is due to the interactive nature of this method, where students can access the material at any time according to their convenience. In addition, student satisfaction

with the learning method also increased. They felt that the use of technology in learning made the material easier to understand and more interesting. Findings of students' affective engagement is show in [Table 6](#).

Table 6. Findings Of Students' Affective Engagement

Theme	Sub theme	Description Findings	Quotes
Affective Engagement	Motivation to learn	Students are more motivated because microlearning is flexible	"I can study anytime according to my time."
	Learning	Students are more satisfied with digital-based learning models	"The material is easily accessible; I can study more comfortably."
	Satisfaction		

[Table 6](#) highlights the findings related to students' affective engagement during the microlearning-based intervention. The table is organized into themes and subthemes, presenting students' emotional and motivational responses to the digital-based learning approach. [Table 6](#) shows that microlearning not only increased students' motivation to learn by providing flexibility, but also contributed to higher levels of satisfaction, as students found the learning process more convenient and accessible. These findings highlight the emotional and motivational benefits of integrating microlearning into a digital-based educational model. The behavioral engagement aspect also showed positive changes. Students who were previously passive in class discussions became more active after accessing the microlearning module. They felt more prepared to discuss because they had already understood the material. In addition, the study found that students interacted more frequently with the digital learning platform after being introduced to the microlearning method. They accessed materials more regularly and collaborated more often with classmates in completing assignments. Findings of student behavioral engagement is show in [Table 7](#).

Table 7. Findings of Student Behavioral Engagement

Theme	Sub theme	Description Findings	Quotes
Behavioral Engagement	Participation in Discussion	Students are more active in class discussions after microlearning	"I feel more confident in discussions after studying."
	Interaction with Technology	Students use digital learning platforms more frequently	"I open the platform more often to view materials."

[Table 7](#) presents the findings related to students' behavioral engagement during the microlearning-based intervention. The findings are organized into themes and subthemes that describe students' active participation and interaction with the digital learning environment. [Table 7](#) shows that microlearning not only encourages more active participation in class discussions but also leads to greater engagement with learning technologies, as students use digital platforms more frequently to access learning materials. These findings suggest that microlearning positively influences students' behavior, both in terms of their active engagement in discussions and their use of technological tools in the learning process.

Discussion

The results of this study indicate that the integration of microlearning within digital platforms significantly contributes to enhancing student engagement. Based on the paired sample t-test results, the experimental group that received the microlearning intervention showed a significant improvement in engagement, including motivation, active participation, and social interaction, while the control group did not show any meaningful changes. These findings align with previous research, which has shown that microlearning can improve student engagement, particularly in increasing motivation and active participation in academic discussions ([Arnab et al., 2021](#)). The study emphasized that microlearning, when integrated with technology, allows students to become more engaged in the learning process due to its flexible and accessible nature. Furthermore, these findings reinforce by study which focuses on cognitive multimedia learning theory. Presenting information in a concise and multimedia-based format allows students to process material more effectively ([Isibika et al., 2023](#)). The application of microlearning within digital platforms helps to expedite students' understanding of the content, reduce cognitive load, and enhance memory retention. In this context, microlearning provides a solution to the challenges faced by traditional learning methods, which often involve large amounts of information presented at once, confusing students and reducing their engagement levels ([Balasundaram et al., 2024](#); [Espanola & Ouano, 2024](#)). This study also supports the constructivist theory Piaget ([Balasundaram et al., 2024](#)), which argues that learning is most effective when students can build their understanding through flexible and interactive learning experiences. Microlearning, as a digital learning approach, provides students with the opportunity to access information in a digestible format, enabling them to actively construct their knowledge ([Isibika et al., 2023](#); [McKee & Ntokos, 2022](#)).

This flexibility enhances the learning experience, which is crucial in the context of digital learning platforms, where students often face time constraints and need learning experiences that can be tailored to their schedules. Moreover, the results of this study indicate that microlearning strengthens the theory of self-regulated learning (Moges et al., 2025; Zhao & Ma, 2025). In this theory, students who have control over their learning experiences tend to be more active and motivated in completing academic tasks. Microlearning allows students to manage their learning time more efficiently, encouraging them to take ownership of their learning process. This has been shown to improve students' responsibility and autonomy in their studies. The implementation of microlearning provides students the freedom to choose topics and materials that align with their learning needs, thereby enhancing overall engagement (Javorcik et al., 2023; McKee & Ntokos, 2022). Additionally, the findings support social learning theory, which emphasizes that students acquire knowledge not only through direct interaction with learning materials but also through social interaction with peers (Xiong, 2025).

Microlearning, by utilizing various digital features within learning platforms, creates opportunities for collaboration and discussion among students. Features such as discussion forums, collaborative quizzes, and group assignments allow students to share their understandings, solve problems together, and provide feedback to each other (Romero-Rodríguez et al., 2023; Vuolasto & Smolander, 2025). This approach strengthens social interaction within the academic environment, which, in turn, boosts student engagement in learning. Compared to previous studies, this research makes a significant contribution to the existing literature on microlearning and student engagement. Most of the existing research has focused on the effectiveness of microlearning as a learning approach, often in isolation from the context of its integration into digital platforms used in educational settings (McKee & Ntokos, 2022; Xiong, 2025). This study fills that gap by specifically analyzing how microlearning can be integrated into existing learning platforms, contributing a novel perspective to how technology can be utilized in higher education. The practical implications of these findings are substantial for the development of digital learning in higher education institutions. Given that students today are heavily reliant on digital platforms for learning, the integration of microlearning could provide a solution to enhance their engagement in the learning process. In this regard, the development of curricula based on microlearning could help students remain engaged and motivated, even in online learning environments that can often be more isolating.

This study also suggests the importance of developing interactive features within digital platforms, such as discussion forums and collaborative quizzes, to support more effective microlearning-based instruction. Furthermore, the findings suggest that digital platform developers should consider integrating elements that can support active student engagement, such as gamification and social features. The use of such elements can help increase student motivation and enrich their learning experience (Chen et al., 2024; Khoso et al., 2025). Therefore, the implementation of microlearning within digital platforms could not only enhance student engagement in the short term but also contribute to the development of more sustainable learning outcomes in the future. Overall, this study reinforces the idea that microlearning, when effectively integrated into digital platforms, can significantly enhance student engagement in learning (Hart et al., 2021; Prodjosantoso & Hertina, 2019). These findings open up opportunities for the development of more flexible, interactive, and adaptive learning methods that cater to the needs of students in the digital age. Thus, the integration of microlearning in digital learning environments could become a groundbreaking innovation in the development of higher education in the future.

The results of this study demonstrate a significant improvement in student engagement with microlearning-based learning. Several key factors can explain this finding. First, the digital format of microlearning allows students to access content in shorter, yet information-dense, units. In this study, students who received the microlearning intervention were more likely to complete their assignments on time because they could access the learning modules at any time that suited their schedules. This finding supports by study which emphasized that technology-based learning, when delivered in concise and flexible formats, can enhance both the effectiveness of learning and student engagement (Ghasia & Rutatola, 2021). The ability to access learning materials at one's own convenience not only offers flexibility but also accommodates the fast-paced nature of higher education.

Second, the aspect of active engagement in microlearning is a primary factor contributing to the improved engagement scores of students. Unlike traditional, often passive, learning methods, microlearning allows students to interact directly with the content through interactive quizzes, short videos, and dynamic online discussions. This finding aligns with who found that interactive features in digital learning environments increase student motivation and enrich their learning experience (Goertler et al., 2025). More frequent interactions with learning materials, as observed in this study, lead to a deeper understanding and more active participation in academic discussions, which, in turn, accelerates the learning process. Third, the adaptation to the learning patterns of the digital generation is a major reason why students are more engaged in microlearning than in conventional methods. The use of microlearning, which mirrors their everyday digital interaction patterns, helps increase their engagement with academic learning. This finding is supported by who discovered that students are more likely to engage in technology-based learning that reflects the digital lifestyles they already experience (Vuolasto & Smolander,

2025). Therefore, microlearning offers a more tailored approach that aligns with the preferences and habits of today's student generation, who are increasingly connected to the digital world.

This study contributes significantly to the literature on microlearning in higher education, addressing a gap in previous research, which primarily focused on the general effectiveness of microlearning without exploring its integration into digital platforms (Balasundaram et al., 2024; Erdur Harman & Alper, 2024). By examining the impact of microlearning on student engagement in Indonesian higher education, this research opens opportunities for further studies on digital learning methods. The findings show that integrating microlearning into digital platforms enhances student engagement, leading to better learning outcomes and increased motivation. This has practical implications for educational policies, as it suggests that microlearning can offer a flexible, cost-effective approach that aligns with students' needs. Future research could explore how microlearning interacts with other pedagogical methods, such as gamification, and assess its long-term effects and impact across different institutions and student populations. However, the study has limitations. The short duration of the intervention limits the ability to assess the long-term impact of microlearning on student engagement. Additionally, conducting the research in a single institution restricts the generalizability of the findings. Future studies should replicate the research in multiple institutions to understand the broader impact of microlearning. Further research could also explore combining microlearning with other teaching strategies, such as project-based learning, to assess potential synergies. This study provides strong evidence supporting microlearning's effectiveness in enhancing student engagement and offers valuable insights for policymakers, curriculum developers, and academic leaders aiming to integrate digital technologies into education.

By examining the impact of microlearning on student engagement in Indonesian higher education, this research opens opportunities for further studies on digital learning methods. The findings show that integrating microlearning into digital platforms enhances student engagement, leading to better learning outcomes and increased motivation. This has practical implications for educational policies, as it suggests that microlearning can offer a flexible, cost-effective approach that aligns with students' needs. Future research could explore how microlearning interacts with other pedagogical methods, such as gamification, and assess its long-term effects and impact across different institutions and student populations. However, the study has limitations. The short duration of the intervention limits the ability to assess the long-term impact of microlearning on student engagement. Additionally, conducting the research in three institution restricts the generalizability of the findings. Future studies should replicate the research in multiple institutions to understand the broader impact of microlearning. Further research could also explore combining microlearning with other teaching strategies, such as project-based learning, to assess potential synergies. This study provides strong evidence supporting microlearning's effectiveness in enhancing student engagement and offers valuable insights for policymakers, curriculum developers, and academic leaders aiming to integrate digital technologies into education.

4. CONCLUSION

This study reveals that the integration of microlearning within digital platforms significantly enhances student engagement in higher education. Students who participated in the microlearning intervention showed a notable increase in engagement, particularly in active participation and motivation. Microlearning, with its brief and focused format, allows students to access content at any time, making learning more manageable and reducing cognitive load. The findings also highlight that microlearning aligns with the technological learning habits of today's students. The implications of this research suggest that higher education institutions should adopt microlearning as part of their academic curriculum to increase flexibility and inclusivity in learning. However, this study has limitations, such as the short duration of the intervention and the fact that the research was conducted in three institutions. Future research should explore the long-term impact of microlearning and involve multiple institutions to increase the generalizability of the results. Additionally, future studies could investigate the effects of combining microlearning with other pedagogical strategies, such as gamification or project-based learning, to further enhance student engagement and learning outcomes. Overall, this research contributes significantly to the literature on digital and microlearning in higher education, demonstrating that microlearning is an effective approach to modernizing education and aligns with the learning preferences of today's students. Future research can build upon these findings to explore the long-term effects and potential synergies with other pedagogical strategies

5. REFERENCES

- Al-Zahrani, A. M. (2024). Enhancing postgraduate students' learning outcomes through Flipped Mobile-Based Microlearning. *Research in Learning Technology*, 32(1063519), 1–16. <https://doi.org/10.25304/rlt.v32.3110>.
- Alauddin, F. D. A., Aman, A., Ghazali, M. F., & Daud, S. (2025). The influence of digital platforms on gig

- workers: A systematic literature review. *Heliyon*, 11(1), e41491. <https://doi.org/10.1016/j.heliyon.2024.e41491>.
- Alawamleh, M., Al-Twait, L. M., & Al-Saht, G. R. (2022). The effect of online learning on communication between instructors and students during Covid-19 pandemic. *Asian Education and Development Studies*, 11(2), 380–400. <https://doi.org/10.1108/AEDS-06-2020-0131>.
- ALshammari, F. L. (2024). Video-based microlearning and the impact on programming skills and technology acceptance. *Journal of Education and E-Learning Research*, 11(1), 155–165. <https://doi.org/10.20448/jeelr.v11i1.5399>.
- Arnab, S., Walaszczyk, L., Lewis, M., Kernaghan-Andrews, S., Loizou, M., Masters, A., Calderwood, J., & Clarke, S. (2021). Designing mini-games as micro-learning resources for professional development in multi-cultural organisations. *Electronic Journal of E-Learning*, 19(2), 44–58. <https://doi.org/10.34190/ejel.19.2.2141>.
- Auf, T. A. (2024). Concurrent Vocational Education Through Microlearning Approaches at Higher Education, Assessing the Capacity, Awareness and the Will of Universities in Garowe, Somalia. *International Journal for Research in Vocational Education and Training*, 11(2), 285–302. <https://doi.org/10.13152/IJRVET.11.2.6>.
- Balasundaram, S., Mathew, J., & Nair, S. (2024). Microlearning and Learning Performance in Higher Education: A Post-Test Control Group Study. *Journal of Learning for Development*, 11(1), 1–14. <https://doi.org/10.56059/jl4d.v11i1.752>.
- Binmahboob, T. (2020). YouTube as a Learning Tool to Improve Students' Speaking Skills as Perceived by EFL Teachers in Secondary School. *International Journal of Applied Linguistics and English Literature*, 9(6), 13. <https://doi.org/10.7575/aiac.ijalel.v.9n.6p.13>.
- Capuno, R., Revalde, H., Etcuban, J. O., Aventuna, M., Medio, G., & Demeterio, R. A. (2019). Facilitating Learning Mathematics Through the Use of Instructional Media. *International Electronic Journal of Mathematics Education*, 15(1). <https://doi.org/10.29333/iejme/5785>.
- Chen, T., Zeng, Q., Cao, M., Zhang, L., Adyari, B., & Ma, C. (2024). A systematic literature review on the Digital Platform and its role in the circular economy: state-of-the-art and future research directions. *Environmental Research*, 118344. <https://doi.org/10.1016/j.jdec.2024.12.001>.
- Eberhardt, T., Petrik, D., Schaaf, W., & Verl, A. (2025). Unleashing digital engineering for high-configurational systems: A taxonomy for developing digital engineering platforms. *Computers and Industrial Engineering*, 200(October 2024), 110814. <https://doi.org/10.1016/j.cie.2024.110814>.
- Erdur Harman, S., & Alper, A. (2024). The Effect of Online Table Course Videos Created with the Micro-Learning Method on Learning According to the Participants' View. *Malaysian Online Journal of Educational Technology*, 12(3), 93–106. <https://doi.org/10.52380/mojet.2024.12.3.544>.
- Espanola, R. ., & Ouano, J. . (2024). Exploring The Pedagogical Aspects of Microlearning in Educational Settings: A Systematic Literature Review. *Malaysian Journal of Learning and Instruction*, 21(1), 217–247. <https://doi.org/https://doi.org/10.32890/mjli2023.20.2.3>.
- Ghasia, M. A., & Rutatola, E. P. (2021). Contextualizing Micro-Learning Deployment: An Evaluation Report of Platforms for the Higher Education Institutions in Tanzania. *International Journal of Education and Development Using Information and Communication Technology*, 17(1), 65–81. <https://eric.ed.gov/?id=EJ1285500>.
- Goertler, T., Papert, M., Fischer, I., & Schmidt, M. (2025). Building digital platform ecosystems: A synthetization of fundamental design topics from a literature review. *Digital Business*, 5(1), 100109. <https://doi.org/10.1016/j.digbus.2025.100109>.
- Hart, C., Costa, C., D'Souza, D., Kimpton, A., & Ljbusic, J. (2021). Exploring higher education students' critical thinking skills through content analysis. *Thinking Skills and Creativity*, 41(May), 100877. <https://doi.org/10.1016/j.tsc.2021.100877>.
- Hava, K. (2019). Exploring the role of digital storytelling in student motivation and satisfaction in EFL education. *Computer Assisted Language Learning*, 34(7), 958–978. <https://doi.org/10.1080/09588221.2019.1650071>.
- Hesse, A., Ospina, P., Wieland, M., Yepes, F. A. L., Nguyen, B., & Heuwieser, W. (2019). Short communication: Microlearning courses are effective at increasing the feelings of confidence and accuracy in the work of dairy personnel. *Journal of Dairy Science*, 102(10), 9505–9511. <https://doi.org/10.3168/jds.2018-15927>.
- Isibika, I. S., Zhu, C., De Smet, E., & Musabila, A. K. (2023). The influence of user-perceived benefits on the acceptance of microlearning for librarians' training. *Research in Learning Technology*, 31(1063519), 1–14. <https://doi.org/10.25304/rlt.v31.2930>.
- Javorcik, T., Kostolanyova, K., & Havlaskova, T. (2023). Microlearning in the Education of Future Teachers: Monitoring and Evaluating Students' Activity in a Microlearning Course. *Electronic Journal of E-Learning*, 21(1), 13–25. <https://doi.org/10.34190/ejel.21.1.2623>.

- Jeong, K. O. (2016). A study on the integration of google docs as a web-based collaborative learning platform in EFL writing instruction. *Indian Journal of Science and Technology*, 9(39). <https://doi.org/10.17485/ijst/2016/v9i39/103239>.
- Jupe, E. R., Purushothaman, M., Wang, B., Lushington, G., Nair, S., Nadipelli, V. R., Rubin, B., Munroe, M. E., Crawley, J., Nair, S., Armstrong, G., Sorathia, A., & Adelman, B. (2025). Impact of a digital platform and flare risk blood biomarker index on lupus : A study protocol design for evaluating self efficacy and disease management. *Contemporary Clinical Trials Communications*, 45(March), 101471. <https://doi.org/10.1016/j.conctc.2025.101471>.
- Khoso, A. K., Honggang, W., & Darazi, M. A. (2025). Empowering creativity and engagement: The impact of generative artificial intelligence usage on Chines EFL students' language learning experience. *Computers in Human Behavior Reports*, 18(February), 100627. <https://doi.org/10.1016/j.chbr.2025.100627>.
- Kryzhanivska, K., Tuomisalo, T., Blomqvist, K., & Kuivalainen, O. (2025). Leveraging temporary teams for international opportunity creation on digital platforms. *Information and Organization*, 35(1), 100554. <https://doi.org/10.1016/j.infoandorg.2024.100554>.
- Liang, X., & Bautista, O. O. (2025). Student negotiated syllabus and students' engagement and academic procrastination: A mixed-method study. *Acta Psychologica*, 252(August 2024), 104681. <https://doi.org/10.1016/j.actpsy.2024.104681>.
- McKee, C., & Ntokos, K. (2022). Online microlearning and student engagement in computer games higher education. *Research in Learning Technology*, 30(1063519), 1–12. <https://doi.org/10.25304/rlt.v30.2680>.
- Moges, B. T., Assefa, Y., Tilwani, S. A., & Azmera, Y. A. (2025). It is all about an appealing environment: Linking the learning environment dimensions with student engagement in Ethiopian higher education context. *Social Sciences and Humanities Open*, 11(November 2024), 101211. <https://doi.org/10.1016/j.ssaho.2024.101211>.
- Newnham, M. P., & Dutt, C. S. (2023). Treasure hunt: the quest for knowledge by hotel employees in Dubai, UAE. *Journal of Human Resources in Hospitality and Tourism*, 22(2), 167–190. <https://doi.org/10.1080/15332845.2023.2153555>.
- Noriega, H. R., & Ramos, K. V. (2022). Designing a Reading Comprehension App Using Design-Based Research Framework. *Proceedings of the International Conferences on E-Society 2022 and Mobile Learning 2022*, 282–286. https://doi.org/10.33965/es_ml2022_202202c040.
- Prijanto, J. H., & Kock, F. De. (2021). Peran Guru Dalam Upaya Meningkatkan Keaktifan Siswa Dengan Menerapkan Metode Tanya Jawab Pada Pembelajaran Online. *Scholaria: Jurnal Pendidikan Dan Kebudayaan*, 11(3), 238–251. <https://ejournal.uksw.edu/scholaria/article/view/4318>.
- Prodjosantoso, A. K., & Hertina, A. M. (2019). The Misconception Diagnosis on Ionic and Covalent Bonds Concepts with Three Tier Diagnostic Test. *International Journal of Instruction*, 12(2), 1477–1488. <https://eric.ed.gov/?id=EJ1201190>.
- Romero-Rodríguez, J. M., Ramirez-Montoya, M. S., Glasserman-Morales, L. D., & Ramos Navas-Parejo, M. (2023). Collaborative online international learning between Spain and Mexico: a microlearning experience to enhance creativity in complexity. *Education and Training*, 65(2), 340–354. <https://doi.org/10.1108/ET-07-2022-0259>.
- Suvandy, A., Chatwattana, P., & Nilsook, P. (2024). Development of Digital Literacy and Digital Empathy with Micro-learning via Activities on Metaverse. *Higher Education Studies*, 14(2), 79. <https://doi.org/10.5539/hes.v14n2p79>.
- ten Cate, D., Dikken, J., Ettema, R. G. A., Schoonhoven, L., & Schuurmans, M. J. (2023). Development of a microlearning intervention regarding nursing nutritional care for older adults: A multi-methods study. *Nurse Education Today*, 120(April 2022), 105623. <https://doi.org/10.1016/j.nedt.2022.105623>.
- Vuolasto, J., & Smolander, K. (2025). From Many to One : A Case Study of Cooperative Enterprise Systems in B2B Digital Platform Creation. *Procedia Computer Science*, 256, 3–11. <https://doi.org/10.1016/j.procs.2025.02.089>.
- Xiong, X. (2025). Influence of teaching styles of higher education teachers on students' engagement in learning: The mediating role of learning motivation. *Education for Chemical Engineers*, 51(February), 87–102. <https://doi.org/10.1016/j.ece.2025.02.005>.
- Zhao, W. Q., & Ma, R. (2025). Investigating the relationship between goal orientation, self-efficacy, positive emotionality, and affective engagement among Chinese students. *Acta Psychologica*, 253(January), 104735. <https://doi.org/10.1016/j.actpsy.2025.104735>.