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## The Role of Microlearning in Lifelong Learning and Its Effectiveness for Generation Z

### Abstract

This study aims to examine the role of microlearning in lifelong learning and its effectiveness for Generation Z. With the advancement of digital technology, Generation Z, known for their habit of consuming information rapidly and having a shorter attention span, requires a more flexible and efficient learning approach. Microlearning, which delivers content in small, easily digestible chunks, provides a fitting solution to meet these needs. This research explores how microlearning can enhance student engagement, facilitate self-directed learning, and strengthen long-term retention of information. Additionally, the study assesses the potential application of microlearning in regular education, considering the readiness of resources and stakeholders involved. The findings suggest that microlearning is effective in supporting lifelong learning, offering flexibility in terms of time and space, and improving learning outcomes for Generation Z. However, its implementation needs careful preparation with adequate technological support and proper arrangements to ensure optimal impact on the educational process.

**Keywords:** Generation Z, Microlearning, Lifelong Learning

### 1. Introduction

Since the spread of the COVID-19 virus globally, many schools and educational institutions have begun implementing online learning (e-learning) (Widad & Bakar, 2021). However, the adoption of e-learning has faced several challenges, one of which is maintaining students' focus and attention throughout the learning process. It is clearly impractical to equate the duration of online learning to that of face-to-face classroom sessions. In addition to being costly, extended lessons can lead to fatigue and boredom, causing students' attention to wane (Fitria et al., 2022).

E-learning does not always guarantee optimal learning processes, and sometimes certain learning objectives are not achieved. Students using e-learning systems often find themselves distracted by social media notifications, online games, or other non-educational distractions (Prijanto & Kock, 2021). Therefore, presenting content in e-learning poses a significant challenge in finding strategies to deliver content that is engaging, easy to understand, and effective, despite numerous distractions that may divert attention during learning. This issue is further compounded by decreased focus, motivation, and attention among students during online learning, a problem also experienced by trainees in various companies and government offices (Fitria, 2020).

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One solution to address the decline in attention and motivation in learning is the application of microlearning, first introduced by Hector Correa in 1963 in his book *The Economics of Human Resources*. Since the onset of online learning, microlearning has become increasingly popular and adopted by schools, companies, and government offices due to its ability to help students absorb material more easily in shorter amounts of time. This new strategy, microlearning, is predicted to assist students in achieving their learning goals in e-learning environments. The term microlearning combines two words: “micro,” meaning small, and “learning,” referring to the act of learning, thus describing learning in small, focused segments. The content refers to learning objects used in electronic learning environments (Fitria, 2022).

Generation Z is a generation that has grown up amidst rapid technological advancements and always-connected internet. Known as digital natives, they are accustomed to using social media and online platforms, flourishing in an era of massive information and technological growth (Nurlaila et al., 2024). This generation is adaptable to digital learning environments. The ideal learning style for them involves digital media-based learning, particularly audio-visual learning that combines sound and visuals, such as videos, which help them understand material more easily (Alit & Tejawati, 2023).

Technological advancements and changes in learning styles in the 21st century have driven a transformation in educational methods. Generation Z, born and raised in the digital era, exhibits unique characteristics in their learning processes, such as a preference for brief and interactive information (Hasnida et al., 2023). Microlearning, an approach that uses short and concise chunks of material, emerges as a relevant solution to address these needs. Microlearning enables flexible, focused, and easily accessible learning via digital devices, making it an effective method to enhance student engagement and learning retention (M et al., 2024).

Microlearning is a pedagogical concept that emphasizes learning in short segments, and it can be implemented through various platforms (Simonson et al., 2018). This method presents content in small units, typically lasting only a few minutes and easily accessed via mobile devices (Palmer & Blake, 2018). Microlearning is often described as an effective learning strategy across various educational contexts (Khong & Kabilan, 2020) and has been considered a promising approach in work-based learning (Leong et al., 2021). Its popularity continues to grow due to its flexibility and ease of use in different formats. This method is ideal for individuals with busy schedules who still wish to gain new insights. Furthermore, microlearning is cost-effective and can be combined with other learning methods. The primary goal of this approach is to present information in a way that is easy to understand, remember, and apply in everyday life.

Although microlearning holds great potential for lifelong learning, there is still limited understanding of its effectiveness in long-term learning outcomes and how this method supports Generation Z in achieving their educational goals. Moreover, challenges in implementing microlearning, such as content quality and relevance, student engagement, and technological infrastructure support, must also be addressed to ensure optimal use of this method. Therefore, this study is necessary to explore the role of microlearning in lifelong learning, identify factors influencing its effectiveness, and evaluate the extent to which this method can help Generation Z enhance their understanding, skills, and academic achievement. Previous research on microlearning has been conducted, such as studies by Rafika Nurmala Santi, Robinson Situmorang, and Tuti Iriani titled *The Potential of the Microlearning Model as an Innovative Learning Strategy for Learning Materials: A Systematic Review*. Another study is by Tira Nur Fitria, titled *Microlearning in Teaching and Learning Process: A Review*. Lastly, there is research by Kelvin Leong, Anna Sung, David Au, and Claire Blanchard titled *A Review of the Trend of Microlearning*.

These three studies indicate that microlearning is not a new concept. However, the difference in the current study lies in its focus on how microlearning contributes to lifelong learning and its effectiveness for Generation Z. This research is more oriented toward an

empirical study evaluating the direct impact of microlearning on Generation Z in the context of lifelong learning at the Islamic University of Syekh Yusuf (UNIS Tangerang). Meanwhile, the other studies primarily offer literature reviews on the models, implementation, and trends of microlearning in a broader educational context.

## **2. Methods**

This study adopts a qualitative approach, focusing on collecting descriptive data in the form of both written and verbal words from key informants who are relevant to the research topic. The purpose of this approach is to gain a deeper understanding of the meaning, experiences, and perspectives of the participants (Abdussamad, 2021). The research design applied is a case study, with a specific focus on exploring the role of microlearning in supporting sustainable learning and its effectiveness for Generation Z, particularly at UNIS Tangerang.

This study will explore how UNIS Tangerang students utilize microlearning, the challenges they face, and the impact of this approach on their learning experiences. Through interviews, observations, and document analysis, the research aims to provide a broader insight into the implementation of microlearning in an academic setting. The findings are expected to contribute to the development of more effective learning strategies tailored to the characteristics of the current digital generation.

## **3. Discussion**

### **3.1. The Role of Microlearning in Supporting Sustainable Learning for Generation Z**

Generation Z refers to individuals born between 1995 and 2010 (Ramadhani & Khoirunisa, 2025). They are the first generation to have grown up with technology, including computers, mobile devices, internet access, and social media platforms. As digital natives, Generation Z is closely connected with social web use, making technology an integral part of their identity (Singh & Dangmei, 2016). The rapid progress of the digital world throughout their lives has given Generation Z distinct characteristics compared to previous generations. One of the most notable differences is their dependence on mobile phones for various aspects of life, from communication and learning to social activities (Firamadhina & Krisnani, 2020).

Microlearning is an approach that delivers learning in short bursts, often referred to as short-term learning. While lacking a standardized definition, this concept emphasizes the delivery of content in small units designed for quick and effective learning. Microlearning is commonly used in e-learning and other digital environments, where learning takes place through technology that allows flexible access to information. This approach focuses on skill-based, targeted learning strategies, making it easier for students to understand content in a short time. Additionally, microlearning enables real-time searches for information, images, and videos via mobile devices, speeding up access to relevant content (Park & Kim, 2018).

Microlearning is a short learning method that can be implemented by educational institutions or companies. This approach focuses on delivering small amounts of information in a limited time, contrasting with traditional methods that present large quantities of material at once. Microlearning is considered more efficient as it enhances memory retention, encourages knowledge exploration, and accelerates the development of new skills. This type of learning can take the form of online courses, training, seminars, or workshops that last for hours or days. Participants often receive certificates as evidence of their achievements. With a variety of themes and concepts available, microlearning offers flexible learning alternatives without the need for long-term education (Tira Nur Fitria et al., 2022).

Microlearning has several key characteristics that distinguish it from other learning methods, including: (Fitria, 2022)

- a. Content is presented in small, short units, making it quicker to prepare and deliver.
- b. The cost of creating materials is lower because fewer resources are needed.
- c. It covers a range of topics, especially those focused on both technical and non-technical skills, though it is less suitable for highly complex material.
- d. Learning is more interactive, with media variety and short quizzes integrated, creating a social media-like experience.
- e. The brief presentation format makes material easier to remember, allowing students to revisit sections they didn't fully understand.
- f. The high flexibility allows students to access content anytime, whether online or offline.
- g. The smaller group size (5–10 students) leads to more focused and effective learning.
- h. Short learning durations require careful selection of material and skillful teaching methods to meet learning objectives efficiently.

These characteristics highlight the effectiveness of microlearning in e-learning environments, where content is broken into smaller, digestible pieces, reducing the likelihood of students losing focus due to external distractions. Furthermore, the content is specific, providing not only theoretical knowledge but also examples or practices related to real-world issues. The brief nature of the material makes the learning process faster, especially when accessed via mobile devices, which allows students to understand the material without being distracted by other elements. Additionally, microlearning is flexible and adaptable, enabling students to access and review material whenever necessary. This approach helps improve students' understanding and memory retention in the long term (Ugliotti & Osello, 2022).

Microlearning has become an innovative approach in education that aligns well with the characteristics of Generation Z. As a generation that has grown up in the digital age, Generation Z is accustomed to quick, flexible, and technology-based access to information. Therefore, microlearning plays a vital role in supporting sustainable learning through its various advantages, such as delivering content in concise, interactive formats that are accessible anytime and anywhere. One of microlearning's main roles is to enhance student engagement and motivation. By presenting material in a brief and engaging manner, such as short videos, infographics, and interactive quizzes, microlearning helps Generation Z students stay focused and prevent losing interest during the learning process. Additionally, this approach allows students to engage in self-directed learning at their own pace, improving comprehension and information retention (Ghafar et al., 2023).

The flexibility of microlearning in education, where students can access materials whenever they need them either via mobile devices or digital platforms—aligns well with Generation Z's learning style, which relies on technology for information retrieval and academic task completion. With easy access to learning content, students can continue their learning even with limited time or busy schedules. Another key benefit is that microlearning aids in skill-based learning. It allows modular delivery of content, where students can study specific topics in small, manageable segments that are easier to understand and apply. This is especially useful for practical skills learning, such as software proficiency, foreign languages, or problem-solving techniques.

Lastly, microlearning supports the concept of lifelong learning, which is essential in an ever-evolving job market. With its easily updated and adaptable format, microlearning provides opportunities for students to continue learning and developing even after completing their formal education. Overall, microlearning serves as an adaptive, effective method of learning that meets the needs of Generation Z. By leveraging digital technology, this approach not only enhances the student learning experience but also contributes to building a culture of continuous learning that is relevant to the challenges of modern times.

### 3.2. The Implementation of Microlearning in Enhancing Engagement and Retention of Generation Z Learners

As discussed in the previous section on the characteristics of microlearning, this approach is more commonly applied in online learning compared to traditional face-to-face instruction. This is due to the nature of online learning, which relies on small units of content and short learning sessions or activities designed to help learners effectively grasp a subject. Microlearning allows learners to study independently with a high degree of flexibility, enabling them to adjust the pace and timing of their learning according to their needs. Moreover, by leveraging digital technology and various interactive platforms, microlearning can enhance learner engagement and retention of material, making it a more adaptive and efficient solution in the modern learning ecosystem.

Several studies have highlighted both the advantages and limitations of the microlearning process, as follows:

- a. Microlearning is an effective strategy for reducing cognitive load during online learning, including intrinsic, extraneous, and germane loads. The use of microlearning strategies in online education helps students understand the material better. It offers more flexibility as students can choose when they are ready to learn, enabling them to manage unproductive cognitive load while stimulating relevant cognitive load. As a result, students' learning outcomes are generally very good (Susilana et al., 2022).
- b. Microlearning-based instructional media may serve as a practical solution to motivate students to learn independently. Teachers need to provide engaging learning materials to encourage creative thinking and deeper exploration of subjects. The use of information and communication technology is essential to ensure the continuous progression of the learning process. Microlearning can be utilized by educators to foster creativity and autonomy in students' learning, with the expectation that they can develop engaging micro-content that inspires creative thinking (Yuniarsih et al., 2022).
- c. Microlearning is an e-learning method that presents information in concise and focused units, making it an ideal approach for quickly finding answers to specific questions through the media provided. This method enhances students' interest in the course by offering material in the form of infographics, hyper-content modules with QR codes linking to additional resources, and supplementary videos, all of which facilitate access to the learning content anytime and anywhere (Rafli & Adri, 2022).
- d. After conducting trials, an evaluation of the effectiveness of microlearning-based case study implementation revealed that the results of the t-test were significant at 7.769, proving that the application of case-study-based microlearning had a significant impact on student learning outcomes. This method can be applied through blended learning to minimize challenges faced by students (Yusnidar & Syahri, 2022).
- e. Microlearning is an excellent strategy for improving learning outcomes and self-efficacy in nursing students, particularly during internships. This approach is recommended because multimedia accommodates various learning styles and positively impacts student learning outcomes and self-efficacy (Zarshenas et al., 2022).

As educators, we can implement microlearning in the classroom by starting with breaking down the content into smaller sub-topics, each delivered in under 10 minutes. This method can also be combined with a flipped classroom technique, where students are given video links or infographics to study independently before the class session. This allows students to familiarize themselves with the material before moving on to the next topic, making classroom time more effective. During the learning process, ensure all students bring the necessary devices, such as smartphones or laptops. Dedicate around 5 minutes to sharing the digital materials, then engage

students in interactive activities like online quizzes to foster their involvement. Before the session concludes, divide students into small groups for discussion to deepen their understanding of the material. After class, assign homework that guides students to explore the next sub-topic. This approach not only prevents students from feeling overwhelmed but also helps reinforce understanding by connecting previously learned content with the upcoming material.

Implementing microlearning in the current learning system at UNIS Tangerang may not be fully feasible immediately. Adopting such a system requires time for both faculty and students to adapt. Moreover, in traditional face-to-face learning, it is likely that microlearning can only be integrated partially, rather than fully adopted. Factors such as technological infrastructure readiness, instructor competence in designing microlearning content, and students' readiness to accept a more concise and focused learning method must also be taken into consideration. Therefore, a phased approach with the right strategies is necessary for effective microlearning implementation, without compromising the quality of learning at UNIS Tangerang.

For instance, in traditional classroom settings, microlearning can be integrated with face-to-face instruction, both theoretically and practically. If the regular sessions last 50–100 minutes per meeting (with one credit hour equivalent to 50 minutes), microlearning can be incorporated into specific sections of the meeting as a strategy to enhance students' understanding. Microlearning in regular classes can utilize electronic or printed media, such as infographics, worksheets, video lessons, Android-based apps, or even educational games. Its flexibility and digital nature make microlearning feasible without spatial and temporal constraints, especially in online learning, where it can even become the primary method of content delivery.

At UNIS Tangerang, implementing microlearning must also be tailored to the existing large-scale classroom structure (30–50 students per class). Therefore, the learning content must be designed into smaller, more focused segments while still aligning with the class schedule and the topic being covered. Instructors can utilize various microlearning formats, including text, video, images, audio, quizzes, and gamified elements during the learning process. The brief delivery of content makes it easier for students to understand the concepts taught without losing the essence of the learning experience. Moreover, variation in the application of microlearning is key to ensuring its effectiveness while maintaining the core substance of the material.

For example, instructors can use microlearning to spark discussion before diving into the main topic or as a summary after the main session. This allows the brief nature of microlearning to still align with the curriculum's overall learning objectives. Additionally, the implementation of microlearning at UNIS Tangerang must also take into account the readiness of both students and instructors to adopt this method. Faculty members need to be skilled in designing engaging microlearning content, while students should be motivated to engage in independent learning to maximize the potential of microlearning. Providing training for instructors on creating digital microlearning content can be a solution to enhance the effectiveness of this method.

Furthermore, technological infrastructure is a crucial factor in the success of microlearning implementation. The availability of a user-friendly Learning Management System (LMS) platform that is easily accessible to students will greatly assist in the deployment of this method. In addition, access to digital devices and a stable internet connection must be ensured so that students can fully participate in microlearning-based education. Currently, the LMS platform at UNIS Tangerang is limited to Google Classroom, making the development of an e-learning system integrated with the Academic Information System (SIKAD/SINA UNIS) a significant task for the successful implementation of microlearning.

Moreover, periodic evaluations of the effectiveness of microlearning in supporting learning at UNIS Tangerang should be conducted. Feedback from students and faculty on their experiences with microlearning can provide valuable data for improving the strategy. This evaluation will serve as a foundation for refining the implementation of microlearning, ensuring

its seamless integration into the existing learning system while maintaining the quality of education provided.

### **3.3. Challenges and Factors Influencing the Successful Implementation of Microlearning in the Learning Process**

The success of a learning process or method depends on various interrelated factors. These factors include both internal and external aspects that determine the effectiveness of learning and how well learners can understand and apply the material. While microlearning offers numerous benefits, there are several challenges that may hinder its success, including:

- a. **Time Limitations and Depth of Material:** Microlearning focuses on delivering information in short time frames, which can limit the scope of the content covered. Complex material is difficult to convey effectively in microlearning format without losing its essence.
- b. **Variations in Students' Learning Styles:** Not all students may be suited to microlearning, particularly those who prefer conventional or deeper learning approaches. Differences in learning style preferences can affect the effectiveness of microlearning for each individual.
- c. **Technology Access and Internet Connectivity:** The implementation of microlearning heavily relies on digital technology, such as smartphones, tablets, or computers. Unstable internet connections or limited access to devices can pose challenges for some students.
- d. **Lack of Active Engagement and Deep Reflection:** Since microlearning focuses on short sessions, there is a risk of students lacking deep engagement with the material. Students might passively consume information without taking the time for reflection or deeper application.
- e. **Challenges in Evaluating and Measuring Understanding:** Evaluating the effectiveness of microlearning can be challenging because the content is delivered in small segments that may not fully capture students' holistic understanding. Proper evaluation methods are needed to assess comprehension and the impact of microlearning-based learning.

The success of microlearning implementation in education depends on several key factors. One important aspect is the design of the learning experience, which should be interactive and engaging. Content should be presented visually, audibly, and interactively to enhance student engagement. Elements such as animations, short videos, and quizzes can strengthen the effectiveness of this method. Furthermore, the relevance and quality of the content must be ensured. Microlearning materials should be systematically structured to align with academic needs or skills to be developed. If the content is too shallow or unorganized, the effectiveness of the learning process may decrease.

Integration with other teaching methods, such as blended learning or flipped classrooms, can enrich students' learning experiences. This combined approach helps address the limitations of microlearning in delivering more complex content. Equally important is the technological infrastructure. The availability of learning platforms such as Learning Management Systems (LMS) or mobile learning applications is essential, along with ensuring that students have access to devices and stable internet connections.

Another important factor is the readiness of both students and instructors to adopt microlearning. The success of this method largely depends on students' ability to learn independently and their motivation to engage with the material. Instructors also need a solid understanding of how to design and implement microlearning in order to deliver it effectively. Finally, ongoing evaluation and development are crucial to ensure that microlearning remains

optimal. Regular assessments of the materials and teaching methods, along with feedback from both students and instructors, can serve as the basis for improving the quality and effectiveness of microlearning in the future.

#### 4. Conclusion

Microlearning plays a crucial role in supporting continuous learning, especially for Generation Z, who have shorter attention spans and are accustomed to receiving information quickly through technology. By breaking down material into smaller, digestible segments, microlearning allows students to learn in a more flexible, efficient, and focused manner without feeling overwhelmed. This approach is highly effective in boosting student engagement, encouraging independent learning, and enhancing long-term memory and information retention.

Despite its many benefits, the implementation of microlearning in regular educational settings requires thorough preparation. The readiness of all involved parties educators and learners alike as well as the provision of adequate resources, such as technology and appropriate content, are key factors for successful implementation. Therefore, careful planning is essential to ensure that this method is applied optimally, providing the maximum benefit in the learning process.

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