



Integrating Microlearning Content into a Learning Management System to Enhance Entrepreneurship Skills in Higher Education

Nurhikmah H¹, Sella Mawarni², Abdul Malik Ramli³, Baso Asrul N. Bena⁴,
Imam Dedikasi Malik Nur⁵

¹ Educational Technology at Universitas Negeri Makassar, Makassar, Indonesia

² Educational Technology at Universitas Negeri Makassar, Makassar, Indonesia

³ Doctoral Program in Educational Sciences at Universitas Negeri Makassar, Makassar, Indonesia

⁴ Doctoral Program in Biology Education at Universitas Negeri Makassar, Makassar, Indonesia

⁵ Psychology Study Program at Universitas Negeri Makassar, Makassar, Indonesia

*nurhikmah.h@unm.ac.id

Abstract. In the digital era, pedagogical methods have evolved significantly, with Microlearning emerging as a prominent approach. Microlearning offers content that aligns with the brain's information-processing mechanisms, facilitating more digestible material. This study aimed to develop microlearning content to enhance the effectiveness and efficiency of entrepreneurial courses, particularly at the postgraduate level. The research was conducted at the Educational Technology Study Program, Postgraduate Program of Makassar State University, employing a Research and development methodology through the ADDIE development model. Findings indicate that microlearning content enables students to engage in a more interactive, practical, and concise learning experience, especially in micro-videos and infographics. This content is meticulously crafted into bite-sized learning segments. The developed microlearning content can be integrated with the SYAM-OK UNM Learning Management System, supporting the previously implemented blended learning patterns and offering a solution to enhance the effectiveness of entrepreneurial education.

Keywords: microlearning, micro contents, entrepreneurship skills.

1 Introduction

Learning methods always develop following technological, information, and scientific developments. Various studies in education have been conducted to identify and predict more effective and efficient learning patterns. The microlearning learning method is one of the new trends starting to be widely used in classroom learning [1, 2]. Based on the research, it is known that the human brain is more effective in learning through repetition and providing structured and focused stimuli [3–5]. The concept of

Microlearning in his class found that students prefer to learn the material in small and easily accessible pieces rather than in one long meeting [6–9].

Microlearning is a learning method that focuses on presenting learning material in small, structured, and easy-to-learn pieces for students. Learning material in Microlearning usually includes short videos, pictures, infographics, or other digital content that can be accessed quickly and easily via electronic devices such as smartphones, tablets, or laptops. The important point in Microlearning is concise; this can be in small learning units or short-term learning activities [10–12]. Microlearning methods are currently widely used in developing e-learning content. Learning content in e-learning began to be developed in a shorter and more accessible way.

Entrepreneurship is an important field to develop to generate innovation and create new jobs. Entrepreneurship courses at the master's level aim to internalize entrepreneurial values, norms, and ethics, benchmark through research, and produce more innovative product development or build business systems according to scientific fields. However, entrepreneurship learning is generally carried out conventionally with lecture and reading methods, which sometimes need to be more interesting and easier for students to understand. In addition, too much complex entrepreneurship learning material often makes it difficult for students to remember and apply this information in the real world.

Based on the situation analysis and the results of the Forum Group Discussion (FGD) with a team of entrepreneurship course lecturers in the Educational Technology study program of Universitas Negeri Makassar, it can be concluded that learning media innovations are needed to deliver lecture material in a short, concise, structured and time-efficient format so that students have more time to work on developing their business plans. Learning in the form of Microlearning can be the right solution to increase the effectiveness and efficiency of learning in entrepreneurship courses in the Educational Technology Study Program. Microlearning helps students learn more interactively, practically, and briefly through digital media such as videos, infographics, or games designed concisely in learning pieces. Microlearning can be integrated into the SYAMOK UNM Learning Management System. Microlearning helps students understand learning material more quickly and easily and develop skills needed in entrepreneurship, such as creativity, innovation, and problem-solving.

1.1 Basic Concepts of Microlearning

Microlearning comes from the words micro and learning. Micro means very small, while learning means acquiring knowledge or skills through learning, practicing, being taught, or experiencing something. Microlearning be defined as small pieces of information used to fulfill certain learning outcomes [13–15]. Generally, content on Microlearning ranges from 1-10 minutes. Microlearning is short and focused learning on one particular topic or concept, presented in multimedia form such as video, audio, or infographics. Microlearning is designed to provide relevant and easy-to-understand information quickly, making it easy to remember and apply in everyday life. Microlearning as an effective tool for improving learner retention and transfer of learning,

as it enables learners to focus on key concepts and skills in a highly targeted and focused manner [16–18].

Microlearning is considered a new paradigm to facilitate learning for busy learners because, in Microlearning, information is broken down into small units, making it easier for students to learn and can be accessed at any time. Several learning platforms implementing the microlearning concept include Google Premiere, Headspace, Lasting, Word of the Day, and TED. Some basic concepts that need to be understood in Microlearning include:

- a. Short and focused content: Microlearning content should focus on a single topic or concept.
- b. Multimedia-based learning: Microlearning can be presented in various multimedia forms such as video, audio, or infographics.
- c. Easily accessible content: Microlearning content should be easily accessible and accessible from multiple devices such as smartphones, tablets, or computers.
- d. Continuous learning: Microlearning should be integrated into programs to reinforce learned knowledge and skills.

The concept of Microlearning is different from macrolearning, both literally and conceptually. Macrolearning refers to learning with a large and long time scale. Microlearning can be used to develop new skills and levels of understanding. Microlearning is also appropriate when students want new skills that require an in-depth understanding of a concept. Meanwhile, Microlearning focuses on small, concise, and short learning. Microlearning is used to explore concepts and solve practical problems. Microlearning is suitable for students who want specific problem-solving. Some of the differences between the two terms can be explained in Table 1 below [14, 19–22]

Table 1. Differences between Macrolearning and Microlearning

	Macrolearning	Microlearning
What does the prefix mean?	Large, long, over time, large scale	Small, short, minute in scale
What is it?	Developing a new skill and level of understanding	Exploring concepts and solving practical problems
What is the desired outcome from learning?	The learner wants a new skill or a deeper understanding of a concept	The learner wants to solve a specific problem.
What is the content like?	Large modules Elements of formal learning Complex issues Learning arranged over time	Small nuggets of information Elements of Informal Learning Simple issues Just-in-time, on-the-job learning
When is it important in the	Understanding the job, people, systems, strategies, industry,	Injections of new information at all career stages to solve various

	Microlearning	Microlearning
workplace?	environment	problems faced every day
How long does it take?	Hours – Days	1 second - 15 minutes
When is it important in the workplace?	Understanding the job, people, systems, strategies, industry, environment	Injections of new information at all career stages to solve various problems faced every day
How long does it take?	Hours – Days	1 second - 15 minutes

Microlearning has developed into a research trend in various fields, including learning at the formal education level (schools and campuses). Research data from [23], which discusses the trend of microlearning publications, explained that research on Microlearning is increasing and may become a future trend. Based on the research analysis results, it was found that many publications discussed Microlearning from the perspective of e-learning or mobile learning, and higher education is the level of education that is often researched [1, 24–26]. At the tertiary level, students are considered to be more initiative, able to identify learning needs independently, and able to be responsible for their goals and learning progress [27].

1.2 Microlearning Strengths and Weaknesses

Microlearning is a learning approach that uses short learning modules packaged in bite-sized content to maximize learning effectiveness and reduce the time needed to learn material. Following are some of the advantages of Microlearning when used in learning [18, 24, 28] :

- a. Time efficiency. With a short duration, Microlearning can help students learn more quickly and efficiently.
- b. Accessibility. Microlearning learning modules can be accessed anytime and anywhere via mobile devices, thus enabling participants to learn anywhere and not limited to a certain time or place.
- c. Focus. Microlearning allows participants to focus on a topic without being distracted by other material.
- d. Involvement. Bite-sized content makes learning more interesting and interactive so that participants are more involved in the learning process.
- e. Easy to apply. With learning modules that are short and easy to access, participants can easily apply the material learned daily.

Small, concise, and short-time micro-learning is, of course, with some drawbacks. Before implementing Microlearning, it is necessary to consider its weaknesses. Here are some disadvantages of Microlearning:

- a. It is not suitable for complex topics because Microlearning is usually short and limited, so it is not suitable for complex topics and requires in-depth understanding.
- b. There may be too much information. If too many learning modules are given separately, participants may lose the overall picture and have difficulty integrating the information provided.
- c. It cannot replace class-based learning. Microlearning is more suitable as a support for classroom-based learning rather than as a substitute.
- d. Not suitable for certain learning styles. Some participants may need to be more comfortable with technology-based learning, so Microlearning may not suit them.

1.3 Characteristics of Entrepreneurship Courses

The entrepreneurship course is one of the compulsory subjects in the Educational Technology study program at the Postgraduate Program of Universitas Negeri Makassar—entrepreneurship courses weighing three credits. Taking an entrepreneurship course at the postgraduate level has many benefits that can help prepare students to start and manage their businesses. Some of the reasons why entrepreneurship courses are important at the postgraduate level are:

- a. Prepare students to start their own business. Entrepreneurship courses at the postgraduate level help students understand various aspects of starting and running their own business. This course teaches students how to develop successful business ideas, make business plans, and manage business finances.
- b. Develop business management skills. Entrepreneurship at the postgraduate level can help students develop important business management skills, such as leadership, decision-making, problem-solving, and time management skills. These skills will help students become more effective and successful entrepreneurs.
- c. Expanding professional network. Taking entrepreneurship courses at the postgraduate level can help students build their professional network in the industry they want to be in, which can open doors for business opportunities and partners.
- d. Develop creative and innovative thinking. Entrepreneurship at the postgraduate level can help students develop creative and innovative thinking, which can help them find new ideas and creative solutions to business problems.
- e. Become more competitive in the job market. While the main goal of entrepreneurship at the postgraduate level is to help students start their businesses, the skills and knowledge gained from this course can also make them more competitive in the job market, especially in business management or business consulting.

Based on the curriculum of the Postgraduate Educational Technology study program, the entrepreneurship course has three learning outcomes, namely:

- a. Internalize entrepreneurial values, norms, and ethics in running a business.
- b. Conduct benchmarking through research by the business being and or will be developed.
- c. Producing more innovative product development through market testing or building business systems according to the scientific or business fields being developed to survive /exist.

2 Method

The research method used is R&D (Research & Development) research, while the development model chosen is the ADDIE model. The ADDIE model consists of five stages: analysis, design, development, implementation, and evaluation. The subjects of this study were students of the Educational Technology study program, Makassar State University postgraduate program, whose role was to provide information, feedback, and evaluation of products throughout the development process. Data collection techniques in this study consisted of questionnaires, interviews, and documentation. The microlearning quality assessment questionnaire was prepared based on indicators from Peters [14] from a book entitled *The Definitive Guide to Microlearning: The What, Why, and How to Guide to Leveraging Microlearning*.

3 Findings And Discussion

3.1 Findings

Microlearning development is carried out according to the ADDIE model's stages: Analysis, Design, Development, and Implementation. In the analysis stage, the needs were identified for lecturers and students of the educational technology study program at the UNM postgraduate program. Needs analysis was carried out using a questionnaire instrument. The analysis revealed that 26% of respondents frequently access short video content, indicating a preference for this format. Additionally, 55% of respondents preferred learning through short videos.

Furthermore, 35% of respondents reported spending 10 to 15 minutes reading learning materials. These findings demonstrate the suitability of Microlearning for the Entrepreneurship course in the TP Master Program at UNM, as 71% of respondents agreed and 26% strongly agreed that Microlearning is suitable for the course. Overall, the research indicates that integrating Microlearning into the learning management system can effectively enhance entrepreneurship skills in higher education, aligning with the learning preferences and needs of the students.

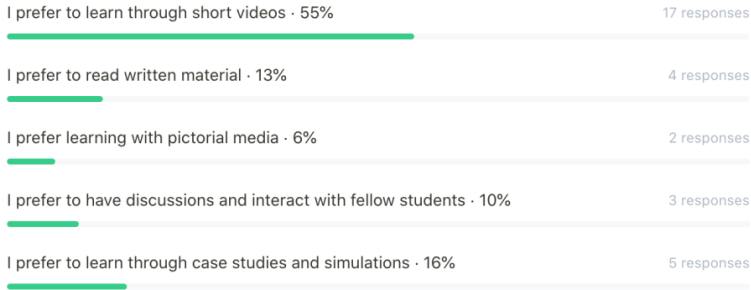


Fig. 1. Results of Needs Analysis related to Student Learning Preference

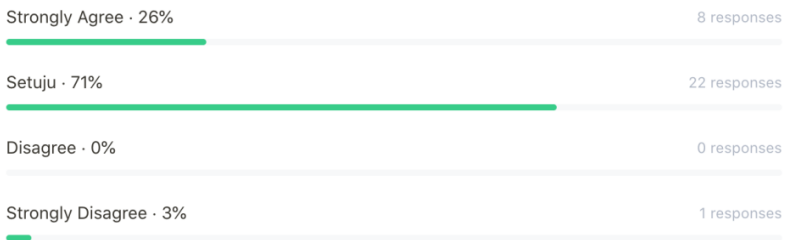


Fig. 2. Results of Needs Analysis Related to Microlearning Needs

The statement of the need for Microlearning, reinforced by the questionnaire results, shows that most students feel that their study time is limited or very limited. This figure reaches 23% for students who feel their study time is limited and 45% for students who feel their study time is limited. This data confirms the need to present an efficient and effective learning approach to overcoming the limitations of student study time.

In this context, needs analysis activities for developing Microlearning in micro video and infographic formats are becoming increasingly relevant. Developing concise and focused microlearning content through micro-videos and infographics will help optimize students' study time. With short duration and easily accessible content, Microlearning can provide an efficient solution for students with limited time.

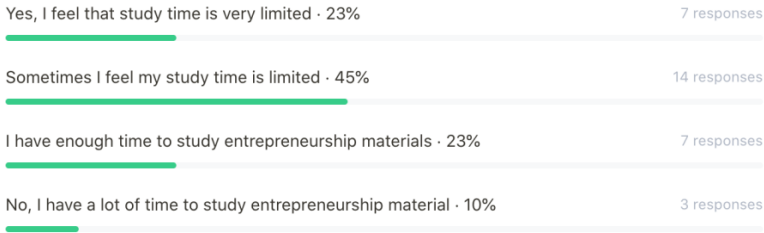


Fig. 3. Results of Needs Analysis Related to Time to Learn Entrepreneurship Material

Based on the needs analysis results, development goals are formulated, namely Microlearning, which will be developed as micro-content in video and infographic formats. At the design stage, the course syllabus is mapped to match each material topic with the type of content to be produced. The results of the syllabus mapping with the microlearning content plan to be developed can be seen in Table 2. Video scripts were also created at the design stage, and applications were selected to create infographics.

Table 2. Types of Microlearning in Entrepreneurship Courses

Material Topic	Microlearning	
	Micro Videos	Infographics
Mindset Development to Become an Entrepreneur	√	√
Creativity and Innovation	-	√
Benchmarking and Business Plans	√	√
Literature Studies and Business Research	√	√
Business Feasibility Study	√	√

The development stage is the micro video and infographic production stage. Infographics are made using the Canva platform, and micro videos are uploaded on the Youtube platform, making it easier to integrate into the LMS. In the implementation stage, students study asynchronously online at the LMS using Microlearning developed for each material topic. The microlearning quality assessment questionnaire at the evaluation stage, adapted from the microlearning quality criteria from Peters [14] from a book entitled *The Definitive Guide to Microlearning: The What, Why, and How to Guide to Leveraging Microlearning*, which consists of (1) microlearning content aligns with business goals; (2) production quality is superior; (3) keep microlearning videos short, targeted and lean; (4) Demonstrate knowledge in a variety of ways; (5) access anytime on any device; and (6) Create a social learning environment. Then, the questionnaire for assessing the quality of Microlearning in entrepreneurship courses is categorized into four aspects: aspects of learning objectives, aspects of quality, aspects of efficiency, and aspects of flexibility. The rating scale uses a Likert scale ranging from 1 – 4 (very poor – very good)

Table 3. Microlearning quality assessment based on aspects of learning objectives

Statement	Scoring Scale			
	1	2	3	4
Is the microlearning content in the Entrepreneurship course relevant to the Sub-CPMK (Sub-Course Learning Outcomes) that has been set in the RPS/Syllabus?	0%	4.3 %	56.5%	39.1%
Does the microlearning content in the Entrepreneurship course help you achieve the set learning goals?	0%	4.3 %	34.8%	60.9%

Table 4. Microlearning quality assessment based on aspects of quality

Statement	Scoring Scale			
	1	2	3	4
What do you think about the quality of microlearning content in Entrepreneurship courses?	0%	0%	56.5%	43.5%
Did the quality of the micro-video on Entrepreneurship make you interested in studying?	0%	4.3%	39.1%	56.5%
Does the quality of infographics in Entrepreneurship courses make you interested in learning?	0%	4.3%	47.8%	47.8%

Table 5. Microlearning quality assessment based on aspects of efficiency

Statement	Scoring Scale			
	1	2	3	4
Does the short duration of micro-videos (< 10 minutes) provide benefits in understanding lecture material?	0%	8.7%	39.1%	52.2%
Does the infographic (1 page) presented provide benefits in understanding lecture material?	0%	4.3%	56.5%	39.1%
Can the micro learning presented in the Entrepreneurship course help your learning efficiency?	0	0%	43.5%	56.5%
Does the microlearning presented in the Entrepreneurship course provide opportunities for you to apply more of the material in business development projects?	4.3%	0%	34.8%	60.9%

Table 6. Microlearning quality assessment based on aspects of flexibility

Statement	Scoring Scale			
	1	2	3	4
How is the flexibility of access (when and what devices) micro learning is presented in the Entrepreneurship course?	0%	4.3%	39.1%	56.5%
Does the micro learning presented in the Entrepreneurship course provide learning flexibility according to your schedule/desires?	0%	4.3%	30.4%	65.2%

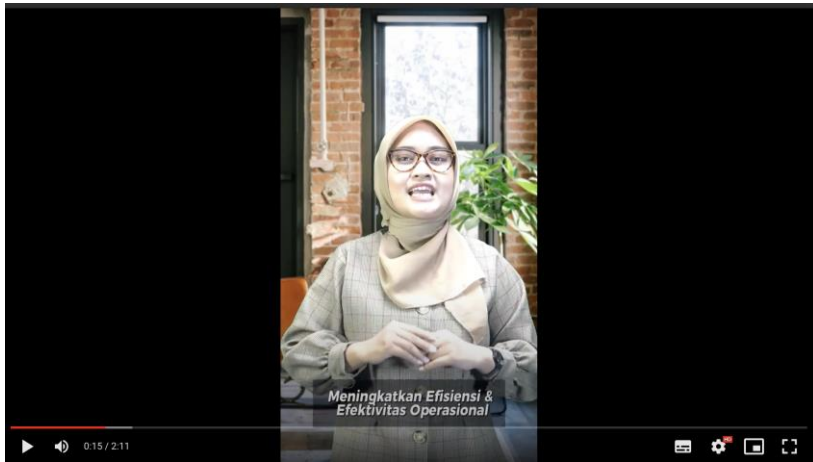


Fig. 4. Example of a Micro Video Display



Fig. 5. Example of an Infographic Display

4 Discussion

The needs analysis results played a crucial role in shaping the development of Microlearning in this paper. The analysis provided valuable insights into the preferences and requirements of the learners, which were then incorporated into the microlearning content design. The findings revealed that a significant percentage of respondents, 26%, frequently accessed short video content, indicating a preference for this format. This insight became the foundation for including micro video content in the developed microlearning materials. Moreover, 55% of respondents expressed a learning preference for short videos, reinforcing the importance of providing content that aligns with learners' preferences. This insight influenced the decision to utilize multimedia formats, such as videos and infographics, in the microlearning materials to cater to diverse learning styles and preferences.

The analysis also sheds light on the ideal length of learning materials, with 35% of respondents reporting that they usually spend 10 to 15 minutes reading them. This valuable input guided the development process, ensuring that each microlearning segment stayed within this time frame, optimizing learners' ability to digest and retain information effectively. The results further confirmed the suitability of Microlearning for the Entrepreneurship course in the TP Master Program at UNM, with 71% of respondents agreeing and 26% strongly agreeing with its applicability. This validation

emphasizes the potential of Microlearning to enhance entrepreneurship skills in higher education and aligns well with learners' needs and preferences.

The discussion of the results also highlighted the key characteristics of Microlearning that were successfully incorporated into the development process. The concept of short and focused content was utilized to create bite-sized modules that enabled learners to stay engaged and retain information efficiently [6, 24, 29, 30]. Using multimedia formats, easy accessibility, and integration with the Learning Management System (LMS) ensured a seamless learning experience, allowing learners to access content conveniently [26, 31–33]. Microlearning has been applied in various contexts, including higher education, work-based learning, faculty development, and teaching programming basics [6, 30, 34, 35].

The limitations of Microlearning were also taken into account during the development process. The recognition that Microlearning might not be suitable for complex topics led to carefully selecting the learning materials, focusing on practical problem-solving concepts rather than intricate theoretical subjects. Additionally, steps were taken to ensure that the microlearning approach complemented classroom-based learning rather than replacing it entirely, acknowledging that both have distinct advantages and serve different purposes in the learning journey.

In conclusion, integrating microlearning content into the Entrepreneurship course was driven by a thorough needs analysis, which provided valuable insights into learners' preferences and requirements. By tailoring the microlearning materials based on these findings, the researchers have successfully designed an effective learning experience that aligns with learners' needs, enhances entrepreneurship skills, and maximizes the potential for retention and application of knowledge. Implementing Microlearning in higher education can pave the way for a more efficient and engaging learning process that resonates with the needs of contemporary learners in the digital age.

5 Conclusion

The research on integrating Microlearning into the Entrepreneurship course highlights the careful design of multimedia materials to engage learners, providing flexibility for accessing resources through the Learning Management System. High production quality was emphasized, using superior assets to enhance the learning experience. The study also emphasizes demonstrating knowledge through varied approaches, including practical scenarios. While effective for enhancing entrepreneurship skills, it was acknowledged that Microlearning might not suit highly complex topics, leading to practical and problem-solving-oriented concepts for the course. The successful integration of microlearning content into the Learning Management System for the Entrepreneurship course at UNM showcases the potential of Microlearning as an innovative and effective learning approach in higher education. By aligning with learners' preferences and needs, Microlearning can create a more engaging and personalized learning experience, resulting in improved retention and application of

knowledge. The study contributes valuable insights for educators, curriculum designers, and policymakers, emphasizing the importance of adopting modern learning strategies that cater to the ever-evolving demands of learners in the digital age. With its ability to efficiently enhance skills and knowledge acquisition, Microlearning holds promise as a transformative force in the future of education. As the landscape of higher education continues to evolve, integrating Microlearning into pedagogical practices can serve as a vital tool in nurturing entrepreneurial talents and fostering a dynamic learning environment for students.

References

1. Gherman O, Turcu CE, Turcu CO (2022) An Approach to Adaptive Microlearning in Higher Education. ArXiv Prepr. ArXiv220506337
2. Romanenko YN, Solodovnikova E, Maksimenko N (2023) Microlearning as a new method of teaching soft skills to university students. *Frontiers*, p 1177516
3. Grill-Spector K, Henson R, Martin A (2006) Repetition and the brain: neural models of stimulus-specific effects. *Trends Cogn Sci* 10:14–23
4. Shail MS (2019) Using micro-learning on mobile applications to increase knowledge retention and work performance: a review of literature. *Cureus* 11:
5. Scherer F, Scherer M (2007) How" Micro" Can Learning Be? A Neuropsychological Perspective on Microlearning. *Didact Microlearning Concepts Discourses Ex* 110–124
6. Sung A, Leong K, Lee C (2023) A study of learners' interactive preference on multimedia microlearning. *J Work-Appl Manag* 15:96–119
7. Jiaqi Yin, Tiong-Thye Goh, Bing Yang, Yang Xiaobin (2021) Conversation Technology With Micro-Learning: The Impact of Chatbot-Based Learning on Students' Learning Motivation and Performance. <https://journals.sagepub.com/doi/10.1177/0735633120952067>. Accessed 25 Aug 2023
8. Krasnova T, Kouznetsova A, Ovsyannikova M, Loginova A (2023) Microlearning For Generation Z In The Foreign Language Classroom. *IATED*, pp 987–996
9. Alias NF, Abdul Razak R (2023) Exploring The Pedagogical Aspects of Microlearning in Educational Settings: A Systematic Literature Review. *Malays J Learn Instr MJLI* 20:267–294
10. Andriotis N (2018) What Is Microlearning: A Complete Guide For Beginners. In: *E-Learning Ind.* <https://elearningindustry.com/what-is-microlearning-benefits-best-practices>. Accessed 24 Aug 2023
11. Díaz Redondo RP, Caeiro Rodríguez M, López Escobar JJ, Fernández Vilas A (2021) Integrating micro-learning content in traditional e-learning platforms. *Multimed Tools Appl* 80:3121–3151
12. Emerson LC, Berge ZL (2018) Microlearning: Knowledge management applications and competency-based training in the workplace. *UMBC Fac. Collect.*
13. De Gagne JC, Park HK, Hall K, Woodward A, Yamane S, Kim SS (2019) Microlearning in health professions education: scoping review. *JMIR Med Educ* 5:e13997
14. Katy Roby Peters (2022) *The Definitive Guide to Microlearning*. Valamis. Valamis
15. Oliveira AW, Brown AO, Zhang WS, LeBrun P, Eaton L, Yemen S (2021) Fostering creativity in science learning: The potential of open-ended student drawing. *Teach Educ* 105:103416

16. Aldosemani TI (2019) Microlearning for Macro-outcomes: Students' Perceptions of Telegram as a Microlearning Tool. In: Våljataga T, Laanpere M (eds) *Digit. Turn Sch. Policy Pract.* Springer, Singapore, pp 189–201
17. Clark RC, Mayer RE (2016) *E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning.* John Wiley & sons
18. Palti A, Rosenberg-Kima R (2021) A microlearning online framework for teaching programming basics. pp 1369–1369
19. Godwin-Jones B (2003) *Tools for Distance Education: Towards Convergence and Integration.* Lang. Learn. Technol.
20. Bal IA, Duha MSU, Arslan O, Collier J, Marcelle P, Dolowitz A, Bernhardt J, Swanson M, Dash M *The Theory of Learning in Micro.*
21. Shirazi F, Heidari S, Hosseinzadeh P, Zolfegharzade H (2023) Comparison the effects of online micro-learning and online brain storming on nursing students' awareness about mistreatment of HIV/AIDS patients. *J Sabzevar Univ Med Sci* 29:744–755
22. Kohnke L (2023) *Microlearning as a Teaching and Learning Approach.* In: *Using Technol. Des. ESLEFL Microlearning Act.* Springer, pp 1–6
23. Leong K, Sung A, Au D, Blanchard C (2020) A review of the trend of microlearning. *J Work-Appl Manag* 13:88–102
24. Abel M-H, Moulin C, Lenne D (2006) *Learning organizational memory and micro-learning (semantics for microlearning).* na
25. Shatte AB, Teague S (2020) *Microlearning for improved student outcomes in higher education: A scoping review.*
26. Susilana R, Dewi L, Rullyana G, Hadiapurwa A, Khaerunnisa N (2022) Can micro-learning strategy assist students' online learning. *J Cakrawala Pendidik* 41:437–451
27. Higgs J (2012) *Planning learning experiences to promote autonomous learning.* In: *Dev. Stud. Auton. Learn.* Routledge, pp 40–58
28. Skalka J, Drlík M (2018) *Conceptual framework of microlearning-based training mobile application for improving programming skills.* Springer, pp 213–224
29. Manning KD, Spicer JO, Golub L, Akbashev M, Klein R (2021) The micro revolution: effect of Bite-Sized Teaching (BST) on learner engagement and learning in postgraduate medical education. *BMC Med Educ* 21:1–11
30. Teichgräber U, Ingwersen M, Ehlers C, Spreckelsen C (2023) *Microlearning for faculty development: Concentrate on what really counts.* *Med Educ* 57:771–772
31. Robinson LK, Green TD, Brown AH (2007) *Making the Most of the Web in Your Classroom: A Teacher's Guide to Blogs, Podcasts, Wikis, Pages, and Sites.*
32. Wang Q, Woo HL, Quek CL, Yang Y, Liu M (2012) Using the Facebook group as a learning management system: An exploratory study. *Br J Educ Technol* 43:428–438
33. Kasim NNM, Khalid F (2016) Choosing the right learning management system (LMS) for the higher education institution context: A systematic review. *Int. J. Emerg. Technol. Learn.* 11:
34. Simanjuntak FP, Haris D (2023) *Development of Digital-Based Learning Modules Using the Microlearning Method to Improve Mathematical Literacy Skills for 7th Graders at SMP Swasta Bina Bersaudara Medan.* *Asian J Appl Educ AJAE* 2:27–48
35. Palti A, Rosenberg-Kima R (2021) A microlearning online framework for teaching programming basics. pp 1369–1369

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