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Deconstructing Junior High School English Learning Materials based on Microlearning

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Abstract

Microlearning provides smaller units of a subject adapted using technologies that can be accessed anywhere in a relatively short period, making learning activities more efficient and helping students learn with a specific focus in a brief session. This study aims to analyze the extent of microlearning in the existing junior high school English learning materials and describe the description of junior high school English learning materials based on microlearning. This study uses a qualitative research approach to analyze 25 English learning materials applied and used by junior high school English language teachers in East Jakarta, DKI Jakarta. The study found that most of the junior high school English learning materials are not microlearning-based as they do not fulfill the indicators of microlearning-based English materials for the junior high school level. The procedure of deconstructing 36 basic competencies into microlearning object material includes recognizing the topic and the instructional activities as well as finding suitable micro-learning object materials for the activities. The total 195 microlearning object materials are varied, such as Short videos, Games, PPTs, Quizizz, Interactive e-learning Websites, podcasts, YouTube videos, digital flashcards, and many more. In summary, as the existing English learning materials do not fulfill the indicators, the procedure of deconstructing basic competencies is made to form micro-learning object materials.

INTRODUCTION

The pandemic has forced many people to adapt to the circumstances in the last few years, including in the field of education. Online learning methods are widely adopted to support learning activities. One of the methods that people widely use to deliver materials or content is microlearning.

Microlearning can be an alternative or solution for online learning because it provides people with chunks of materials. Microlearning identifies how to deliver the amount of knowledge and information in a series of short chapters that are fine-grained, well-defined, and interconnected, while microcontent is defined as information whose length is determined by a single topic, content that contains a single idea or concept and is accessible through multimedia learning platforms (Jomah, Masoud, Kishore, & Aurelia, 2016; Giurgiu, 2017; Dolasinski & Reynolds, 2020; Hosseini, Ejtehadi, & Hosseini, 2020). Microlearning is one of the suitable methods for online learning activities because it helps learning run more efficiently by breaking down materials into small parts, helps make the materials accessible anytime and anywhere, and enables engagement in the learning activities through digital platforms and using various forms of content, such as videos, infographics, and PPT slides (Susilana et al. 2022).

Digital platforms have nowadays become common media, especially in delivering learning materials. Digital platforms such as Google, YouTube, and WhatsApp are much more likely to be used to deliver student learning materials. As those platforms are easy to use, teachers and students can use them to keep teaching and learning activities on track, even when the situation is unsuitable for them to do the activities (Arthur-Nyarko, Agyei, & Armah, 2020). Those digital platforms mentioned before can also be a good choice for delivering materials with the microlearning method. This is in line with Filipe et al. (2020) who said that microlearning is an approach to present small, concentrated units of knowledge delivered online with no real-time interaction (asynchronously).

Initially, microlearning was created for busy people with little time to learn things, such as employees and workers. Microlearning is immensely beneficial and can be applied to ensure knowledge and skill growth in diverse subjects such as healthcare, engineering, aerospace, production, services, safety, and defense (Job & Ogalo, 2012; De Gagne, et al., 2019; Emerson & Berge, 2018). Microlearning enables people who have tight schedules to learn anywhere and anytime they please. This could either be small learning fragments or short-term learning activities. When learning feels hard to do and the materials seem too complicated to digest, chunk-sized materials with short time consumption are a handy solution (Bannister, Neve, & Kolanko, 2020). The materials can be more engaging, less time-consuming, and cheaper to produce using regular eLearning (Redondo et al., 2021; Sheneman, 2021; Park & Kim, 2018; Dingler et al., 2017; Hug, 2010).

While it is not the best solution for every learning need, it is surprisingly effective for learning materials quickly. Since microlearning provides short bursts of content for learners to study at their convenience, it improves the level of engagement, retention, and the environment of their learning activities (Redondo et al., 2021; Lee, Jahnke, & Austin, 2021; Lin et al, 2020), making it an effective tool for workplace learning and performance. Studies have found that people learn best and are more likely to recall learning when they can process information through small, manageable chunks instead of a longer and more concentrated time frame. All microlearning-based share one key attribute: conciseness.

In previous studies, many researchers have written journals and articles about how microlearning can be implemented in many fields, especially in the workplace. In the hospitality industry, microlearning can help mitigate training barriers and improve an organization's competitive advantage (Jolanski & Reynolds, 2020). Microlearning can be used as performance support for employees and workers, where they, as learners, access the segment at the point of need, such as

when they perform a highly complex task or infrequently. Microlearning can also serve as support for more extended learning. For example, they may attend a half-day in-person training and then access micro-learning segments with key content if they need a refresher later.

Aside from the discussion of microlearning that is suitable for workers to learn new things with their tight schedule, microlearning also can be an excellent method to use by the teacher for their online classes. Again, as the pandemic forces teachers to be creative in delivering the learning materials and doing the learning activities for the students, microlearning can be considered a solution despite the distance between the teacher and students. The microlearning method can be applied to the learning materials made by school teachers without neglecting the assigned curriculum. Thus, there comes a need for school teachers to create microcontents using the microlearning method by deconstructing the existing materials. Deconstructing learning materials means breaking down and understanding the learning materials to show how each micro-content is built up and relates to one another to allow students to accomplish the learning objectives. However, this skill is considered new, and a very limited study has been conducted in Indonesia.

Thus, this study is conducted to discover how existing learning materials can be recreated using the microlearning method into microcontent. It is hoped that the results of this study can give insights to teachers on how to turn a bulk of knowledge into small chunks to access anytime and anywhere for synchronous as well as asynchronous learning.

RESEARCH METHOD

The study's objective is to deconstruct junior high school English learning materials into micro-learning content. This study uses a qualitative research approach as it provides a process of understanding social or human issues and, when conducted properly, can provide a meaningful understanding of people's experiences and perspectives in the context of their personal life settings (Kyngäs, 2020). According to Creswell (2009), "Qualitative researchers typically gather multiple forms of data, such as interviews, observations, and documents, rather than rely on a single data source. Then the researchers review all the data, make sense of it, and organize it into categories or themes that cut across all data sources."

Moreover, the study uses descriptive content analysis as the research method since it can be applied to various types of documents (interview transcripts, speeches, even images) and is used to create concepts, categories, and themes, which can be extended to create models, conceptual structures and conceptual maps that describe the subject under study (Kyngäs, 2020). Hereafter, as cited in Assarroudi et al. (2018), "Qualitative content analysis (QCA) is a research approach for the description and interpretation of textual data using the systematic process of coding". The final product of data analysis is the identification of categories, themes, and patterns" (Elo & Kyngäs, 2008; Hsieh & Shannon, 2005; Zhang & West, 2020).

The data were gathered as secondary data, sourced from the English learning materials applied and used by four junior high school teachers in East Jakarta, DKI Jakarta. Each learning material is labeled 'LM 1', 'LM 2', 'LM 3'. Then, the data were analyzed to identify the extent to which they can be classified as micro contents and were deconstructed into microlearning materials based on Allela (2021). A checklist table was used as the research instrument, involving several learning materials

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identification, the indicators of microlearning-based English materials for junior high school level, and a deconstruction rhetorical column to show the microlearning-based analyses of the learning materials. The indicators were categorized into three major aspects: the 'bite-size' aspect, the 'mobility' aspect, and the 'applicability' aspect. The analysis results were provided in a chunk size presented by topics. To form the syntax of microlearning-based English materials for the junior high school level, the basic competencies (KD) of the 2013 junior high school curriculum became the reference to determine the level, basic competencies, topic/function/text, and language skill and *Introduction to Microlearning* by Melisa Allela (2021) became the references to structure a microlearning-based lesson. Though desk research was generally conducted from March to August 2022, correspondence with the teachers as the learning material providers was also done by e-mail, instant messaging, and meetings at school to clarify the learning materials.

RESULTS AND DISCUSSION

A. The Alignment of the Existing Junior High School English Learning Materials with Microlearning

The results of this study revealed that out of 25 learning materials, 35.8 % fulfilled the 30 indicators, with a total of 269 items of analysis fulfilling indicators of microlearning-based English materials for the junior high school level. The 'bite-size' aspect covers 23% of the total indicator fulfillment, the 'mobility' aspect covers 30% of the total indicator fulfillment, and the 'applicability' aspect covers 48% of the total indicator fulfillment. Table 1 below provides the detailed distribution of the data.

Indicator of Junior High School EnglishLearning Materials Microlearning-based		Frequency	Percentage
Bite-size			
In the form of nuggets	Time of consumption is lessthan 7 minutes	13	5%
	The material is a sequence	1	0%
Part of fragmentsof a bigger topic	The material can be consumed individually	18	7%
Reachable competencies	Learning material offers oneoutcome only	2	1%
	Learning material containsthree or fewer learning objectives	4	1%
Action-oriented	Learning material answersthe question "How-to"	16	6%
	Learning material promotesfollow-up actions or activities	7	3%
Subtotal		61	23%
Mobility			
Available with Open EducationalResources (OER)	Learning material is madeunder an open license	6	2%
Contains basicvisual design standards	intuitive GUI (Graphic User Interface) making interfaces friendly and easy to understand,	0	0%
	Unobtrusive GUI notoverpowering content,	0	0%
	flexible GUI makingprovision for changes and updates,	0	0%
	simple GUI emphasizingcontent and purpose,	0	0%
	properly labeled images,	7	3%

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	relevant images,	15	6%
	Resolution of appropriategraphics,	5	2%
	good photography,	1	0%
	correct use of fonts for printand non-print resources,	22	8%
	proper use of colors	6	2%
Utilize multimedia	In the form of a microlearningobject	18	7%
	Students can operate themicrolearning object	0	0%
Open for immediate reviews and updates	Students can give commentsor feedback	0	0%
	Teachers can give commentsor feedback	0	0%
	Students can develop theirown learning material	0	0%
	Teachers can update thelearning material	0	0%
Subtotal		80	30%
Applicability			
Formality	Applicable in the formal setting of junior high school	25	9%
Suitability	Use full English as the medium of instruction or implement code-switching	20	7%
	Contains comprehendible texts for junior high school level	25	9%
National- Curriculum	Genre-based	25	9%
	Derived from the core and basic competencies (KI/KD) of the 2013 junior high school curriculum	16	6%
	Cover aspects of social function, generic structure,or language features	17	6%
Subtotal		128	48%
TOTAL		**269**	**100%**

Table 1. The employment of the junior high school English learning materials used in the study

No microlearning-based materials were found out of the 25 learning materials used by teachers in four schools. Most of the analyzed learning materials correspond to those of the junior high school levels in the Indonesian Curriculum. Investigation reveals that six learning materials are made under an open license consisting of textbooks, YouTube videos, and website articles. The English learning materials were presented in such microlearning-like objects as PPT, YouTube videos, and website articles since they came in small chunks. However, since they are neither in a sequence nor fulfill most indicators, they cannot be classified as microlearning-based materials. Moreover, the materials taken from the textbooks barely meet the indicator of micro-content since they were hardly mobile nor in a bite-size form.

B. The Deconstruction of Microlearning-based English Materials for Junior High School

The basic competencies (KD) of the 2013 curriculum were deconstructed into the smallest unit of learning called the Microlearning Object Materials (MOM). Each basic competency has its own aim for the learners to learn English. Nine basic competencies of 7-grade materials address nine topics that lead to 38 instructional activities and 38 microlearning objects. 15 basic competencies of 8-grade materials address 15 topics that lead to 81 instructional activities and 81 microlearning objects. Lastly, 12 basic competencies of 9-grade materials address 12 topics that lead to 76 instructional activities and 76 microlearning objects. More details are shown in the following table.

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Class	The Basic Competency of the 2013 Curriculum	Topic / Functions / Text	Lang. Skills	Structural elements	Instructional activities	MOM
7	4.1 menyusun teks interaksi interpersonal …	Text: Interpersonal text	1	3	4	4
	4.2 menyusun teks interaksi transaksional …	Text: Transactional text	1	3	4	4
	4.3 menyusun teks interaksi transaksional …	Text: Transactional text	1	3	4	4
	4.4 menyusun teks interaksi transaksional …	Text: Transactional text	1	3	4	4
	4.5 menyusun teks interaksi transaksional …	Text: Transactional text	1	3	4	4
	4.6 menyusun teks interaksi transaksional …	Text: Transactional text	1	3	5	5
	4.7 teks deskriptif4.7.1. menangkap makna secara kontekstual ...	Text: Descriptive text	1	3	5	5
	4.7 teks deskriptif 4.7.2 menyusun teks deskriptif …	Text: Descriptive text	1	3	4	4
	4.8 menangkap makna secara kontekstual …	Topic:Song	1	3	4	4
Total	**9**	**9**	**9**	**27**	**38**	**38**
8	4.1 menyusun teks interaksi interpersonal …	Text: Interpersonal text	1	3	4	4
	4.2 menyusun teks interaksi transaksional …	Text: Transactional text	1	3	5	5
	4.3 menyusun teks interaksi transaksional …	Text: Transactional text	1	3	5	5
	4.4 menyusun teks interaksi interpersonal …	Text: Interpersonal text	1	3	5	5
	4.5 menyusunteks khusus dalam bentuk greeting card …	Topic: Greetingcard	1	3	4	4
	4.6 menyusun teks interaksi transaksional …	Text: Transactional text	1	3	4	4
	4.7 menyusun teks interaksi transaksional …	Text: Transactional text	1	3	4	4
	4.8 menyusun teks interaksi transaksional …	Text: Transactional text	1	3	4	4
	4.9 menyusun teks interaksi transaksional …	Text: Transactional text	1	3	6	6
	4.10 menyusun teks interaksi transaksional …	Text: Transactional text	1	3	6	6
	4.11 teks recount4.11.1 menangkap makna secara kontekstual …	Text: Recounttext	1	3	8	8
	4.11 teksrecount 4.11.2 menyusun teksrecount …	Text: Recounttext	1	3	7	7
	4.12 teks pesan singkat dan pengumuman/pe mberitahuan (notice) 4.12.1 menangkap makna secara kontekstual …	Topic:Notice	1	3	8	8
	4.12 teks pesan singkat dan pengumuman/pe	Topic:Notice	1	3	7	7

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	mberitahuan (notice) 4.12.2 menyusun tekskhusus …					
	4.13 menangkapmakna secara kontekstual …	Topic:Song lyrics about juniorhigh school life	1	3	4	4
Total	**15**	**15**	**15**	**45**	**81**	**81**
9	4.1 menyusun teks interaksi interpersonal …	Text: Interpersonal text	1	3	6	6
	4.2 menyusun teks interaksi transaksional …	Text: Transactional text	1	3	6	6
	4.3 menangkapmakna secara kontekstual …	Topic: Food and beveragelabel	1	3	7	7
	4.4 menangkapmakna secara kontekstual …	Text: Procedure Text	1	3	7	7
	4.5 menyusun teks interaksi transaksional …	Text: Transactional text	1	3	6	6
	4.6 menyusun teks interaksi transaksional …	Text: Transactional text	1	3	6	6
	4. 7 menangkapmakna secara kontekstual …	Topic: Fairy tale	1	3	7	7
	4.8 menyusun teks interaksi transaksional …	Topic: Passivevoice	1	3	6	6
	4.9 teks informationreport 4.9.1 menangkap makna secara kontekstual …	Topic: Information report	1	3	7	7
	4.9 teks informationreport 4.9.2 menyusunteks information report …	Topic: Information report	1	3	7	7
	4.10. menangkap makna secara kontekstual …	Topic:Ads	1	3	7	7
	4.11 menangkapmakna secara kontekstual …	Topic:Song lyrics about junior high school life	1	3	4	4
Total	**12**	**12**	**12**	**36**	**76**	**76**

Table 2. The Deconstruction of Microlearning-based English Materials for Junior High School

The basic competencies of the 2013 curriculum are varied, starting from comprehending the meaning of things to arranging the text, which is divided into 9, 15, and 12 basic competencies for each level or grade. The topics and the texts are also varied, such as notice, song, label, fairy tale, passive voice, informational report, ads, interpersonal text, transactional text, recount text, and procedures text. The language skill used to present the competencies has different skills, and each competency has a skill, including reading, writing, listening, and speaking. Those skills will be chunked into three structural elements, which are pre-, during-, and post-. Every structural element will be once again chunked into one or more instructional activities, namely roleplay, short talks, dialogue, information gaps, listening to a conversation, presenting images, dialogue, student-to-student conversation, introducing vocabulary, eliciting ideas, dialogue, quiz, brainstorming, guessing from pictures, identifying topic sentences, general and specific ideas, character analysis, and so on as it suits for the structural element. An instructional activity will have a learning object material based on microlearning, for example, short videos, games, PPTs, Quizziz, YouTube videos, podcasts,

infographics, interactive websites, animation videos, and many more. As suggested by Alella (2021), microlearning materials can take various forms of microlearning objects including short chunks of texts; interactive/non-interactive infographics, PDFs, and presentations; short interactive/non-interactive videos; eBooks, flipbooks, and audiobooks; short podcasts and recorded webinars; Mobile apps and short HTML pages; QR codes and learner-generated blog posts; Gamification and serious games; Virtual Reality and Augmented Reality; and Step-by-step checklists and quizzes.

Since microlearning-based learning materials rely on technology as a tool for archiving and storing them, the mobility of existing learning materials must be considered to examine whether those learning materials can be labeled as microlearning-based. Thus, four aspects of mobility, which are available with Open Educational Resources (OER), contain basic visual design standards, utilize multimedia, and are open for immediate reviews and updates, are broken down into smaller and detailed instruments, namely: learning material is made under an open license, intuitive GUI ((Graphic User Interface) making interfaces friendly and easy to understand, unobtrusive GUI not overpowering content, flexible GUI making provision for changes and updates, simple GUI emphasizing content and purpose, properly labeled images, relevant images, resolution appropriate graphics, good photography, correct use of fonts for print and non-print resources, proper use of colors, in the form of microlearning objects, students can operate the microlearning objects, students can give comments or feedbacks, teachers can give comments or feedbacks, students can develop their own learning material, and teachers can update the learning material.

This present study supports the results of the previous studies conducted by Leong, Sung, Au, & Blanchard (2020) and Alenezi (2020) which highlighted that microlearning can be beneficial for busy people, such as workers, who have little time to learn new things. Similarly, studies by Allela, Ogange, Junaid, & Charles (2020) and Mohammed, Wakil, & Nawroly (2018) revealed that microlearning can be helpful for teachers to run an effective learning process. This present study even goes further by showing the feasibility of deconstructing traditional or original learning materials into digital-based microcontents that are more relevant to today's way of learning, which affirmed the study by Nikou & Economides (2018).

CONCLUSION AND RECOMMENDATION

The study found that most junior high school English learning materials are not microlearning-based. Though the learning materials are applicable for junior high school level and several of them (to some extent) can be considered as Microlearning Object Materials, such as PPT, YouTube video, and website articles, they do not come in sequence and fulfill the criteria of microlearning-based materials. A learning material could be a microlearning object, but if it just stands alone, then it could not be considered a microlearning-based material.

To deconstruct the learning material objects into microlearning-based materials, a procedure is needed, especially a thorough understanding of the starting point of deconstructing Microlearning Object Materials. For example, in this research, the base is the basic competency (KD) of the 2013 junior high school curriculum. It is chunked into the smallest unit using the syntax that took references from the basic competency (KD) of the 2013 junior high school curriculum itself and the micro-learning indicators. The Microlearning Object Materials can come in various forms, such as YouTube

videos, podcasts, infographics, short videos, games, PPTs, Quizziz, interactive websites, animation videos, and many more, depending on the purpose and the instructional activities of the skill for learning the materials.

Microlearning is a highly recommended topic to discuss nowadays as digital learning materials are needed for students to learn at ease anytime and anywhere. As this study was limited only to discussing the extent to which junior high school English learning materials fit the microlearning materials, and how the existing materials can be deconstructed into microcontents, further studies are encouraged to discuss how they are delivered in real class settings and whether the implementation can be as effective as expected.

REFERENCES

Alenezi, A. (2020). The Role of e-Learning Materials in Enhancing Teaching and Learning Behaviors. *International Journal of Information and Education Technology*, *10*(1), 48-56.

Allela, M. (2021). *Introduction to Microlearning*. Commonwealth of Learning (COL)

Allela, M. A., Ogange, B. O., Junaid, M. I., & Charles, P. B. (2020). Effectiveness of Multimodal Microlearning for In-Service Teacher Training. *Journal of Learning for Development*, *7*(3), 384-398.

Arthur-Nyarko, E., Agyei, D. D., & Armah, J. K. (2020). Digitizing Distance Learning Materials: Measuring Students' Readiness and Intended Challenges. *Education and Information Technologies*, *25*(4), 2987-3002.

Assarroudi, A., Nabavi, F. H., Armat, M. R., Ebadi, A., & Vaismoradi, M. (2018). Directed Qualitative Content Analysis: The Description and Elaboration of Its Underpinning Methods And Data Analysis Process. *Journal of Research in Nursing*, 23(1), 42–55. https://doi.org/10.1177/1744987117741667

Bannister, J., Neve, M., & Kolanko, C. (2020). Increased Educational Reach through a Microlearning Approach: Can Higher Participation Translate to Improved Outcomes? *Journal of European CME*, *9*(1), 1834761.

Creswell, J. W. (2009). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches.* (3rd ed). Los Angeles: Sage.

De Gagne, J. C., Park, H. K., Hall, K., Woodward, A., Yamane, S., & Kim, S. S. (2019). Microlearning in Health Professions Education: A Scoping Review. *JMIR Medical Education*, *5*(2), e13997.

Dingler, T., Weber, D., Pielot, M., Cooper, J., Chang, C. C., & Henze, N. (2017). Language Learning On-the-go: Opportune Moments and Design of Mobile Microlearning Sessions. In *Proceedings of the 19th international conference on human-computer interaction with mobile devices and services* (pp. 1-12).

Dolasinski, M. J., & Reynolds, J. (2020). Microlearning: A New Learning Model. *Journal of Hospitality & Tourism Research*, *44*(3), 551-561.

Emerson, L. C., & Berge, Z. L. (2018). Microlearning: Knowledge Management Applications and Competency-based Training in the Workplace. *UMBC Faculty Collection*.

Filipe, H. P., Paton, M., Tipping, J., Schneeweiss, S., & Mack, H. G. (2020). Microlearning to Improve CPD Learning Objectives. *The Clinical Teacher*, *17*(6), 695-699.

Giurgiu, L. (2017). Microlearning: An Evolving eLearning Trend. *Scientific Bulletin- Nicolae Balcescu Land Forces Academy*, *22*(1), 18-23.

Hosseini, H. M., Ejtehadi, A., & Hosseini, M. M. (2020). Flipping Microlearning- Based EFL Classroom to Enhance Learners' Self-Regulation. *Language Teaching Research Quarterly*, *20*, 43-59.

Hug, T. (2010). Mobile Learning as 'Microlearning': Conceptual Considerations towards Enhancements of Didactic Thinking. *International Journal of Mobile and Blended Learning (IJMBL)*, *2*(4), 47-57.

Job, M. A., & Ogalo, H. S. (2012). Microlearning as an Innovative Process of Knowledge Strategy. *International journal of scientific & technology research*, *1*(11), 92-96.

Jomah, O., Masoud, A. K., Kishore, X. P., & Aurelia, S. (2016). Microlearning: A modernized education system. *BRAIN. Broad Research in Artificial Intelligence and Neuroscience*, *7*(1), 103-110.

Lee, Y. M., Jahnke, I., & Austin, L. (2021). Mobile Microlearning Design and Effects on Learning Efficacy and Learner Experience. *Educational Technology Research and Development*, *69*(2), 885-915.

Leong, K., Sung, A., Au, D., & Blanchard, C. (2020). A Review of the Trend of Microlearning. *Journal of Work-Applied Management*.

Lin, J., Sun, G., Cui, T., Shen, J., Xu, D., Beydoun, G., Yu, P., Pritchard, D., Li, L. & Chen, S. (2020). From Ideal to Reality: Segmentation, Annotation, and Recommendation, The Vital Trajectory of Intelligent Microlearning. *World Wide Web*, *23*(3), 1747-1767.

Mohammed, G. S., Wakil, K., & Nawroly, S. S. (2018). The Effectiveness of Microlearning to Improve Students' Learning Ability. *International Journal of Educational Research Review*, *3*(3), 32-38.

Nikou, S. A., & Economides, A. A. (2018). Mobile-based Micro-learning and Assessment: Impact on Learning Performance and Motivation of High School Students. *Journal of Computer Assisted Learning*, *34*(3), 269-278.

Park, Y., & Kim, Y. (2018). A Design and Development of Micro-learning Content in e-Learning System. *International Journal on Advanced Science, Engineering and Information Technology*, *8*(1), 56-61.

Redondo, R.P.D., Rodríguez, M.C., Escobar, J. J.L, & Vilas, A.F. (2021). Integrating Micro-learning Content in Traditional e-Learning Platforms. *Multimedia Tools and Applications*, *80*(2), 3121-3151.

Sheneman, L. (2021). Microlearning in K-12 Settings. In *Microlearning in the Digital Age* (pp. 129-138). Routledge.

Susilana, R., Dewi, L., Rullyana, G., Hadiapurwa, A., & Khaerunnisa, N. (2022). Can Microlearning Strategy Assist Students 'Online Learning? *Cakrawala Pendidikan: Jurnal Ilmiah Pendidikan*, *41*(2), 437-451.

Zhang, J., & West, R. E. (2020). Designing Microlearning Instruction for Professional Development Through a Competency-Based Approach. *TechTrends*, *64*(2), 310-318.