# AN ANALYSIS OF SENIOR HIGH SCHOOL ENGLISH LEARNING MATERIALS: MICROLEARNING PERSPECTIVES

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APA Citation: Dewanti, R., Sukmatanti, R., & Iskandar, I. (2023). An analysis of senior high school English learning materials: Microlearning perspectives. *Indonesian EFL Journal, 9*(2), 151-160. https://doi.org/10.25134/ieflj.v9i2.8806.

Received: 25-03-2023 Accepted: 22-05-2023 Published: 30-07-2023

**Abstract:** Microlearning is becoming more popular in education due to its convenience, flexibility, and effectiveness. The popularity emerges from the use of chunking of materials in short and understandable components that makes it easier for learners to attain the information at their convenience. Preferably, learning materials are microlearning-designed. This study aims to analyze whether English learning materials at senior high school are designed based on microlearning principles. Content analysis is used as the research method. Twenty four English learning materials covering various types of materials including textbook, e-module, webpage, as well as, pre-recorded teaching and YouTube videos designed for grade X, XI, and XII collected from three senior high schools in Jakarta are analyzed using microlearning framework. The findings of this study show that the existing learning materials do not conform to microlearning principles. The results of this study reveals the needs to design microlearning-based materials, break the lesson units into micro contents, and produce microlearning object materials for English lessons in high schools to meet the demand of millennial learners and to maximize their potential.
**Keywords:** *English learning materials; microlearning; microlearning object materials.*

## INTRODUCTION

As the demand for online education grows and as more technology-enhanced learning are needed by millennial learners, microlearning becomes more and more popular. Microlearning is suited to millennials, as it is short (no longer than 5 minutes), concentrated (only deals with one learning objective per unit), and engaging (uses a variety of digital learning formats). Kapp and Defelice (2019) argue microlearning activities can include creating quick, meaningful interactions through games, quizzes, flashcards, videos, as well as text messages. These multimodal present resources called microlearning objects, snippets, microlearning units, bite-sized content, instructional units, and microcontent (Abel, Moulin, and Lenne, 2006; Olivier, 2021).

A current definition of microlearning refers to a learning technique that involves bite size lessons to engage learners in the process. Alella (2021) introduces microlearning as the process of learning through bite-sized, well-planned modules, and short – term learning activities. In short, microlearning is a way of teaching and delivering content to learners in bite-sized, bursts at the point of need, with a focused and specific learning outcome. Microlearning presents exciting potential for revolutionizing online education through enhanced user experience, cost savings, flexibility, and gamification. (Hug & Friesin, 2019; Kapp & Defelice, 2019; Alella, 2021).

Studies on microlearning strengthen that microlearning is effective to help learning because there lies learning theories as behaviourism, constructivism, cognitivism, and experiential learning. Other studies also ascertain that microlearning suits remote learning, restricted onsite learning, meager human brain, learner-oriented, active learning, enjoyable learning activities, and millennial friendly (Ariantini *et al.*, 2019; Permana, 2020; Nugraha *et al.*, 2021; Noriska, 2021).

The effectiveness of microlearning to improve students' learning is reinforced by Mohammed *et al.* (2018) which convinced better achievement of students in microlearning group compared to those in traditional group. In addition, Buhu & Buhu (2019) used games, short videos, and short written text as a mode of microlearning lessons to show the advantage of close connection of young people to mobile devices and reduced time required for searching information by students and teachers. Both studies show a significance impact on operating microlearning objects in the classroom for both students and teachers.

Microlearning has also been considered as a promising topic in work-based learning and the applications of microlearning have been widely studied in different fields. As of 2020, there were at least 476 relevant publications exploring the concept. In language learning, microlearning had taken researchers' interest mostly in second language and vocabulary learning (Leong *et al*., 2020). A number of studies on microlearning in Indonesia settings brought discussion on human source training for micro-objects (Surahman *et al*., 2020; Nugraha *et al*., 2021) and a few on microlearning framework and design (Norsanto & Rosmansyah, 2018; Hutauruk *et al*., 2020). On educational levels, microlearning has been studied in English learning media development at primary level (Ariantini *et al*., 2019), science micro media developments at secondary level (Adhipertama, 2021; Tritore, 2022), and micro media development in lectures for higher education (Noriska *et al*., 2021; Rafli &Adri, 2022). Studies covering microcontent have covered field of activities such as gamification (Nagy *et al*., 2017; Norsanto & Rosmansyah, 2018; Redondo *et al*., 2020; Rahmadi *et al*., 2021), podcasts (Hense & Bernd., 2021; Tennyson *et al*., 2022), videos (Iglikova, 2020; Gerbaudo, 2021), and social media (Khlaif & Salha, 2021; Wakam *et al*., 2022).

Successful learning involves a lot of factors – learning strategies, learners' characteristics, teachers, learners' motivation, learning facilities, including learning materials. Learning materials is one of the very influential elements in learning activities since they serve as the basis for much language input the learners receive. Consequently, learning materials have to match the learners' needs. Twenty first century learners are millennial learners that they are very comfortable with technology, ubiquitous computer access, have shorter attention span that they need "millennial" ways of learning materials. Microlearning-based materials suit their needs. Beard *et al.* (2007) asserted that this generation of students has been technologically enabled and shaped by access to world at the touch of a button that the characteristics of this generation should be considered in determining the best way to shape their capabilities to maximize their earning and productivity potential.

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; e-books, 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 (Allela, 2021).

Regarding microlearning principles, bite-sizeness as Allela (2021) describes, cover the learning that is (i) presented in form of nuggets, ii) part of fragments of a bigger topic, (iii) reachable competencies, and (iv) action oriented. Drakidou *et al.* (2018) argues that microlearning fulfils the principles of mobility. Microlearning contents should be available in the open sources to let teachers or learners access, share, and download them on multiple mobile devices. In relation to mobility, the effectiveness of mobile learning and micro learning are interrelated in terms of individualized curation of learning materials enabling a more personalized learning materials. Allela (2021) claimed that using Open Education Resources (OER) for microlearning contexts is beneficial since a broad range of subjects and topics can be covered, save a lot of time and effort, as well as support collaborative environment and expand learning communities. The next principle is the use of basic visual design standards such as Graphical User Interface (GUI), font, color, and graphics to engage students without overshadowing their focus on the content. The good basic visual design standard is to contain intuitive GUI, unobtrusive GUI, flexible GUI, simple GUI emphasizing content and purpose, properly labeled images, relevant images, resolution appropiate graphics, diverse photography of people, good photography, correct use of fonts for print and non-print resources, and proper use of colours. The next principle is about utilizing multimedia. The other principle of microlearning is open for immediate reviews and updates. The small unit of microcontent should be able to make teachers or trainers to review information. Learner-led aspect of microlearning

p-ISSN 2252-7427, e-ISSN 2541-3635
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can possibly have students using collaborative tools to create content and provide feedbacks (Allela, 2021). Jahnke *et al*. (2019) mentioned the benefit of microlearning to support social structures allowing learners to collaborate with peers or community and having teachers actively engaged.

Having the importance of microlearning and microlearning-based materials, this study emerges with the research question as to what extent the existing English learning materials in high school are based on microlearning principles. To answer the research questions then the existing materials are scrutinized using the principles of microlearning derived from relevant references, mostly from Allela (2021) taking it into account the relatively most current one dealing with microlearning.

## METHOD

Content analysis method was employed to investigate the extent to which microlearning principles are used in the existing materials. Content analysis is defined as "a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use" (Krippendorf, 2004, p. 18). The data of this study is learning materials taken from twenty four English learning materials used by five teachers in three public senior high schools located in East Jakarta. The English teachers of the three schools were the data sources. The research instruments were microlearning descriptors that are modified according to the high school contexts. Allela (2021), Drakidou *et al*. (2018), and The 2013 English Curriculum for Senior High School are the bases to construct the indicators. Thirty one indicators of microlearning-based English learning materials derived from three descriptors - bite-sizeness (being the basis of microlearning learning material which is served short, concise, and quick to produce ), mobility (as mobile learning is interlated with microlearning in term of effectivity), and applicability (the urgency of the need of microlearning implementation in the new curriculum called from the limited teaching hours) are used to analyze the existing materials. Each descriptor contains classifications specified into indicators - seven indicators for bite-sizeness, 17 for mobility, and another seven for applicability.

The bite-sizeness indicators are (i) time of consumption is less than 7 minutes, (ii) the material is a sequence, (iii) the material can be consumed individually, (iv) learning material offers one outcome only, (v) learning material contains three or less learning objectives, (vi) learning material answers the question "How to", and (vii) learning material promotes follow up actions or activity. Mobility indicators cover four descriptors: (i) available with Open Educational Resources (OER), (ii) contains basic visual design standards; (iii) utilize multimedia; and (iv) open for immediate reviews and updates. They are then broken down into 17 more details. Applicability deals with the possibilities to apply microlearning in high schools which cover formality, suitability, and the curriculum.

Besides, this study considers the researcher as the research instrument. In qualitative research, the research's role is important and complicated enough as the overall sources and data are depended on him and he acts as the planner, data collector, analyst, data interpreter, as well as research-finding reporter (Moleong, 2021). The data was analyzed using these procedures: formulating a check list table of the compiled learning materials and microlearning-based senior high school English learning material descriptors, checking the fulfilment of indicators from each established descriptors in each learning material; summarizing the fulfillment of the descriptors and decided if any of the analyzed learning materials are based on microlearning.


*Figure 1*. Data collection procedure

## RESULTS AND DISCUSSION

This study resulted with the information about the number and the kinds of existing learning materials, the bases on which the materials are constructed; and the extent to which the materials are based on microlearning principles. There are 24 English learning materials used in the three schools. They are in the form of textbook, e-module, pre-recorded teaching and YouTube videos, whiteboard animation, power point presentation, and webpage. The first four learning materials are the most frequently used by the teachers in the three schools while the remaining others are used personally by different teachers. The materials are constructed based on the basic competencies and core competences of English Curriculum (Permendikbud number 37/2018). There are 33 basic competencies in total to include competencies from three different class levels, level X,XI, XII.

The analysis of microlearning principles used in the materials shows the presence of some microlearning descriptors in the existing English learning materials but they do not seem to be intendedly microlearning designed. The discussion of the findings are elaborated as follows.

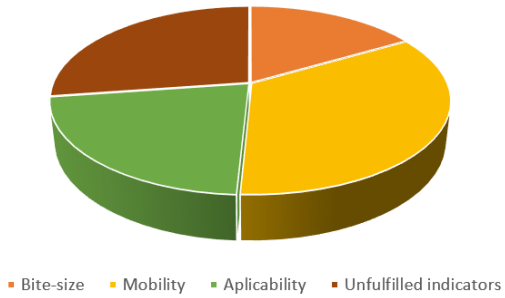


Figure 1. *The indicators fulfilment from the 3 descriptors*

With the three descriptors - bite-sizeness, mobility, and applicability, the analysis found 16.6% fulfilment of bite-sizeness, 34.2% of mobility, and 21.9% of applicability. The fulfilment here does not mean the microlearning principles are all fulfilled; rather, they appear partly in some parts of the learning materials. For examples, there are videos, pre-recorded as well as You tube videos which take only about three to seven minutes long but they are not well-designed as systematically as a unit of a system as microlearning principles require but they stand alone as supporting materials.

Regarding Bite-sizeness, the indicator " *time of consumption is less than 7 minutes"* was found in 12 out of 24 learning materials. The indicator " *the material is a sequence"* was found in 10 out of 24 learning materials. The indicator "*the material can be consumed individually"* can be found in 22 out of 24 learning materials. The indicator "*learning material offers one outcome only"* was found in 21 out of 24 learning materials. The indicator " *learning material contains three or less learning objectives* was found in 19 out of 24 learning materials. The indicator "*learning material answers the question "How to"* was found in 23 out of 24 learning materials. Lastly, the indicator "*learning material promotes follow up actions or activity"* was found in 17 out of 24 learning materials. The summary can be seen in this table.

Table 1. *Distribution of bite-sizeness in the learning materials*

| Descriptors | Indicators | Identified learning materials |
|---|---|---|
| In form of nuggets | Time of consumption is less than 7 minutes. | 12/24 |
| Part of fragments of a bigger topic | The material is a sequence. | 10/24 |
| | The material can be consumed individually. | 22/24 |
| Reachable competencies | Learning material offers one outcome only. | 21/24 |
| | Learning material contains three or less learning objectives. | 19/24 |
| Action oriented | Learning material answers the question "How to". | 23/24 |
| | Learning material promotes follow up actions or activities. | 17/24 |

In the classification of *presented in form of nuggets*, the fulfilment is based on the time consumption of the learning material. Learning materials that are under 7 minutes long or under 1750 words are considered to fulfill this indicator. Several examples of the fulfillment are presented in Learning Material (LM) No. 18 with the type of whiteboard animation video having 2 minutes and 4 seconds of video duration and in LM No. 15 with the type of power point presentation having 369 words out of 1750 words limit. However, learning materials such as LM No. 3 and LM No. 5 do not accommodate the indicator since the former is textbook which each page consists of 12 pages in average and the latter is a pre- recorded teaching video with 7 minutes and 31 seconds duration.

In the classification of *part of fragments of a bigger topic*, the fulfilment is based on the sequential and individuality of the learning material. Learning materials that are a fragment of several sequences of other learning material under the same topic and can be consumed independently without outside sources are considered to fulfill these indicators. Take the example of LM No. 21 as a video in a web page containing sequentially several other videos under the topic of Offering help. This learning material can also be consumed without having to refer to outside resources. The rest of un-checked learning materials, however, are either stand-alone learning material or shared only without the information if it is part of several sequenced learning materials in the lesson.

In the classification of *reachable competencies*, fulfillment is based on the number of learning

p-ISSN 2252-7427, e-ISSN 2541-3635
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outcomes and objectives. Learning materials that contain one maximum of learning outcome and maximum three objectives are considered to fulfill these indicators. Most of the learning materials such as LM No. 9 and LM No. 10 in form of pre-recorded teaching videos consist of one outcome as written in curriculum basic competences and three learning objectives. While the rest of learning material such as LM No. 1 and LM No. 2 cannot fulfill the indicator since they consist of two or three learning outcomes as written in curriculum basic competences and more than three learning objectives.

Lastly in the classification of action oriented, the fulfilment is based on whether the learning material answer the question of "How-to" and promote any follow up activities. Learning materials such as LM No. 16 and LM No. 17 fulfill these indicators as they in order answer the question of "How to" introduce self and others and "How to" describe a place giving a sense of re-findability. Moreover, near the end of the learning material they assign students a quick follow-up assignment

> LM No. 16 timestamp 15:05 to 17:15
> Creating the introduction into one text consisting of 3 paragraphs of the three parts: self-introduction, introduce your desk mate, and introduce your family member.
>
> LM No 17 slide 14.
> "Exercise: describe your favorite place by using the correct structure above"

Regarding Mobility, here are four descriptive of classifications in total to include (i) available with Open Educational Resources (OER) (ii) contains basic visual design standards, (iii) utilize multimedia, and (iv) open for immediate reviews and updates. These classifications then are elaborated into more specific indicators containing: (i) Learning material is made under an open license, (ii) intuitive GUI making interfaces friendly and easy to understand, (iii) unobtrusive GUI not overpowering content, (iv) flexible GUI making provision for changes and updates, (v) simple GUI emphasizing content and purpose, (vi) properly labeled images, (vii) relevant images, (viii) resolution appropriate graphics, (ix) good photography, (x) correct use of fonts for print and non-print resources, (xi) proper use of colors, (xii) in form of microlearning object, (xiii) students can operate the microlearning object, (xiv) students can give comments or feedbacks, (xv) teachers can give comments or feedbacks, (xvi) students can develop their own learning material, and (xvii) teachers can update the learning material.

Table 2. *Fullfillment of mobility indicators*

| Mobility | Indicators | Fullfillment |
|---|---|---|
| Available with Open Educational Resources (OER) | Learning material is made under an open license | 7/24 |
| | Intuitive GUI making interfaces friendly and easy to understand. | 24/24 |
| Contains visual standards basic design | Unobtrusive GUI not overpowering content. | 24/24 |
| | Flexible GUI making provision for changes and updates | 1/24 |
| | Simple GUI emphasizing content and purpose. | 24/24 |
| | Properly labeled images | 17/24 |
| | Relevant images | 18/24 |
| | Resolution appropriate graphics | 20/24 |
| | Good photography | 13/24 |
| | Correct use of fonts for print and non-print resources. | 24/24 |
| | Proper use of colors | 24/24 |
| Utilize multimedia | n the form of a microlearning object. | 24/24 |
| | Students can operate the microlearning object. | 24/24 |
| Open immediate reviews updates | Students can give comments or feedback. | 8/24 |
| | Teachers can give comments or feedback. | 7/24 |
| | Students can develop their own learning material. | 1/24 |
| | Teachers can update the learning material. | 1/24 |

The analysis found that all 24 learning materials have *intuitive GUI making interfaces friendly and easy to understand*, have *unobtrusive GUI not overpowering content*, *have simple GUI emphasizing content and purpose*, have the *correct use of fonts for print and non-print resources* and *proper use of colors*, and are *in form of microlearning object* that *can be easily operated by students*. Only 1 learning material has *flexible GUI making provision for changes and updates*, and *can have students develop their own learning material*, and *teachers to update the learning material*. 7 out of 24 learning materials are *made under an open license*. 17 out of 24 learning materials contain *properly labeled images*. 18 out of 24 learning

materials contain *relevant images*. 20 out of 24 learning materials *apply resolution appropriate graphics.* 13 out of 24 learning materials involve *good photography*. 8 out of 24 learning materials *can have students give comments or feedback*. And 7 out of 24 learning materials *can have teachers give comments or feedback.*

In the classification of availability with open educational resources (OER), the fulfillment is considered by whether the learning material is made under an open license. This means learning materials are allowed for public consumption or freely shared. Learning materials that fulfill this indicator such as LM No. 1 to 4 are available to read online and downloaded as pdf in Sistem Informasi Perbukuan Indonesia (SIBI) website or Repositori institusi kemdikbud website, LM No. 18 to 20 are available on YouTube under the name of teacher's channel, and learning materials such as LM No. 21 and 22 are available freely as a webpage and YouTube video. The rest of the learning materials that do not fulfill this indicator however are a private owner of the teacher or available only through a shared link or "unlisted" on YouTube.


Figure 3. *LM No. 1 available in repositori institusi kemdikbud website*

In the classification of containing basic visual design standards, the fulfilment varied from the characteristics of GUI, the use of image or graphic, to the use of font and color. GUI used in general are all intuitive, unobtrusive, and simple as all of the learning materials can be accessed through PDF Reader online or offline, YouTube Website, Google Doc, AmazonAWS, WebPage, or Microsoft documents in which GUIs (Graphical User Interface) are already very well developed. However, not all the GUI are flexible for changes and updates making LM No. 15 with Google Slide GUI to be the only one available. The indicator involving images, graphics, and photography are considered merely by the existence of them. While fonts are colors related indicators are determined by the readability and the unobtrusively.

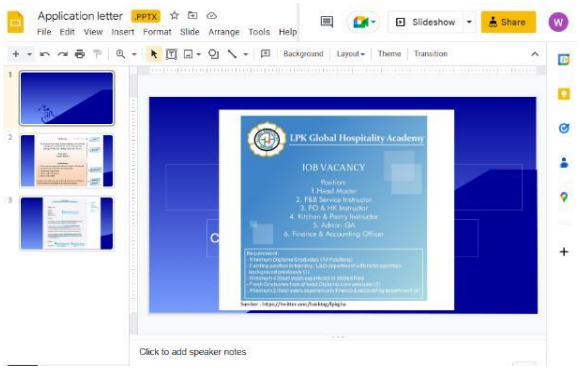


Figure 4. *LM No.15 with its flexible GUI*

In the classification of utilizing multimedia, the fulfillment is decided if the learning material is in or can be classified as microlearning object and can be operated by the students easily. All 24 out of 24 learning materials utilize microlearning objects to include PDF, eBooks, whiteboard animation videos, mentor-driven videos, explainer videos, presentations, and HTML pages. All this form of microlearning objects can be easily operated by students as digital natives.

In the classification of being open for immediate reviews and updates, the fulfillment is afforded by whether teachers and students can give comments or feedbacks and flexibly changing the learning material for development purposes. This the least classification for the unfulfilled indicators since most of the learning materials do not offer space for reviews or change. The examples of learning materials that provide reviews for comments and feedbacks are LM No. 21 - 24 in which the webpage or YouTube videos offer comment section open for teachers or students to give questions or feedbacks. Further, the only learning material that is open for development both by the students and the teachers is LM No. 15 as Google Slide offers the collaborative option letting multiple user to edit or update

In the applicability descriptor, there are three descriptive classifications in total to include (i) formality, (ii) suitability, and (iii) national curriculum. These classifications then are elaborated into more specific indicators containing: (i) applicable in the formal setting of public high school, (ii) use full English as medium of instruction or implement codeswitching, (iii) contains comprehendible texts for high school level, (iv) genre based, (v) derived from core and

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basic competencies (KI/KD) of 2013 curriculum, (vi) cover aspects of social function, generic structure, or language features, and (vii) integrate 4 language skills. Suitability can be explained as the alignment between students' capability in order not to result in cognitive overload as what microlearning should cover to begin with. To achieve that component such medium of instruction and text comprehensibility should be considered. Senior high school texts belong to the 4000 of word level, which is the number of words required for a 96% comprehension of the text (Aziez, 2011). He further explained in which if a learner knows the top 4,000 words in the BNC HFWL (British National Corpus High Frequency Word List) she will know 95.96% of the running words in senior high school texts.

For the formality aspect, the fulfilment of the indicator is determined if the learning material is applicable in any structural element in formal learning or in another word "classroom setting". Allela (2021) pointed out several structural elements to include welcoming to the lesson, awakening prior knowledge, reviewing key points, content, discussion, and assessment. All of 24 learning materials are shown to be able to be used some of the structural elements, mainly: welcoming the lesson such as LM No. 11 and LM No. 13, awakening prior knowledge such as LM No. 15 and LM No. 18, and content such as LM No. 7 to 10.

In the suitability classification, the fulfillment of indicators by using medium of instruction and comprehendible text. Learning materials are decided to fulfill the indicator if it uses full English as the medium of instruction of implement codeswitching as well as containing comprehendible texts for high school level. The analysis shows that 24 out of 24 learning materials fulfill both indicators. The former is determined as 12 learning materials use full English in lesson delivery while the other 12 mix Bahasa Indonesia for translation or elaboration purposes. The comprehendible texts are determined by the basic competences of curriculum and the BNC HFWL (British National Corpus High Frequency Word List).

In the national curriculum classification, the fulfillment of indicators is determined by genre based, deriving from core and basic competences of 2013 curriculum, covering aspects of social function, generic structure, or language features, and integrating 4 language skills. All 24 learning materials fulfill the first three indicators, while the last indicator was fulfilled by 20 learning materials.

Overall, the fulfillment of indicators by the number of learning materials shows 50% and more in the percentage except for the indicators related to flexibility on reviews and updates. The most prominent learning material to show the most microlearning indicators to be fulfilled is LM No. 21 which utilizes HTML page of voaindonesia.com with sequences of learning videos with an average duration of less than 7 minutes. The webpage also offers space for review although updates only can be done by the web developer.

One crucial thing to consider is that learning materials cannot be perceived as microlearning-based learning material if one of the indicators, especially the one in the bite-size content aspect, are not present resulting in none of the above learning material to completely fulfil the microlearning-based criteria. The lack of presence of microlearning-based learning materials used in senior high school gives the urgency for microlearning-based framework for English learning material in senior high school.

Compared to relevant previous studies, the findings of this study underpin Mohammed *et al.* (2018) and Buhu & Buhu (2019) who investigated the strengths of microlearning by the use of games, short videos, and short written texts. Further, this study also corresponds to those of Surahman, *et al.* (2020) & Nugraha *et al.* (2021) in relation to the need for human resource, in this case teachers in Indonesia, training for micro-objects. As a complementary, this research findings reinforce the few studies on microlearning framework and design (Norsanto & Rosmansyah, 2018; Hutauruk *et al*., 2020). This study also enriches English learning media development at primary level conducted by Ariantini *et al*., 2019) as many have been developed for other courses but English at secondary level. Other studies also ascertain that microlearning suits remote learning, restricted onsite learning, meager human brain, learner-oriented, active learning, enjoyable learning activities, and millennial friendly (Ariantini *et al*., 2019; Permana, 2020; Nugraha *et al*., 2021; Noriska, 2021).

## CONCLUSION

This study investigates whether microlearning principles are used in the existing English learning materials in high school. The study is based on the importance of microlearning and micro contents as well as microlearning object materials to fulfil the learners' needs. The analysis of English learning materials used in three public schools in Jakarta

shows that some descriptors of microlearning-based learning material are present in some of the learning materials. However, their occurence cannot be interpreted as microlearning-based because they do not completely contains microlearning-based English learning material descriptors. In other words, it shows the lack of presence of microlearning based learning materials used in senior high school. The results of this study reveals the needs to design microlearning-based materials, break the lesson units into micro contents, and produce microlearning object materials for English lessons in high schools. It is terminative that the urgent need for designing microlearning-based English learning materials is inevitable. Microlearning will certainly change learning direction and perception. Future learning materials can only be fully indulged when they are millennial friendly. Potential millennials will survive in future working competition with befitting learning materials. Curriculum designers and materials developers can do much to ameliorate future education standards.

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