



Developing Microlearning-Based Teaching Materials for Sociology Education: Evaluating Feasibility, Practicality, and Student Acceptability in the Digital Era

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Abstract: This study aims to develop and evaluate the quality of microlearning-based teaching materials for Grade 11 Sociology education and to assess their feasibility, practicality, and acceptability from the perspectives of experts, teachers, and students. The study employed a Research and Development (R&D) design using the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) model. Data were collected through interviews, observations, document analysis, expert validation sheets, and user response questionnaires. The participants comprised subject-matter experts, media experts, instructional practitioners, Sociology teachers, and Grade 11 students involved in the limited trial phase. Quantitative data were analyzed using descriptive statistical techniques to calculate feasibility and response percentages, while qualitative data were analyzed through data reduction, data presentation, and conclusion drawing based on interview findings and open-ended responses. The findings indicated that the microlearning-based teaching materials developed for Grade 11 Sociology achieved an average feasibility score of 91.83%, placing them in the “highly feasible” category. Specifically, the materials received scores of 92.50% from the subject-matter expert, 89.00% from the media expert, and 94.00% from the instructional practitioner. The trial results also demonstrated high levels of practicality and acceptability, with average response scores of 91.56% from students and 92.80% from the teacher. The overall evaluation yielded an integrated score of 92.06%. These findings indicate that the developed teaching materials meet established content and media feasibility criteria, are easy to implement, and are well received by students, while supporting the understanding of sociological concepts and improving instructional efficiency in the digital era. Theoretically, this study contributes to the literature on digital instructional design in secondary education by highlighting the relevance of microlearning to cognitive load theory. Practically, the findings provide educators with a foundation for designing digital learning resources that are adaptive, cognitively manageable, and aligned with the demands of twenty-first-century education.

Article History

Received: 18-06-2026

Revised: 22-07-2026

Accepted: 11-08-2026

Published: 20-09-2026

Key Words:

Microlearning; Sociology
Education; Digital
Learning Materials;
Instructional Design.

How to Cite: Suyuti, Devi Septiandini, Ike Arriany, Putri Shifa Rahmadini, Andrea Nurul Izzah, & Zahra Najwa Sarahah. (2026). Developing Microlearning-Based Teaching Materials for Sociology Education: Evaluating Feasibility, Practicality, and Student Acceptability in the Digital Era. *Jurnal Kependidikan : Jurnal Hasil Penelitian Dan Kajian Kepustakaan Di Bidang Pendidikan, Pengajaran, Dan Pembelajaran*, 12(3), 1278-1292. <https://doi.org/10.33394/jk.v12i3.21338>



<https://doi.org/10.33394/jk.v12i3.21338>

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Introduction

The digital transformation in education has driven a paradigm shift in learning in various countries. The rapid development of information and communication technology, coupled with increased access to digital devices, has transformed the way students acquire, process, and utilize information. International organizations such as UNESCO emphasize the importance of developing adaptive, flexible, and learner-centered learning to address the



challenges of the 21st century (Fahmy Dalimunthe et al., 2025). Students are no longer only required to master factual knowledge, but also to possess critical thinking skills, digital literacy, creativity, collaboration, and problem-solving abilities. In this context, innovation in teaching materials is a strategic aspect determining the success of the learning process in schools (Tambunan et al., 2024).

Changing characteristics of the student generation reinforce the urgency of developing learning models that meet contemporary learning needs. The current generation of students grew up in an environment saturated with digital technology and are accustomed to accessing information quickly, concisely, and visually (Amirahma & Setyasto, 2024). Learning patterns that tend to prioritize practicality often lead to conventional learning methods that rely on lengthy, teacher-centered presentations being considered less engaging. As a result, students' attention is easily diverted, resulting in low engagement in the learning process. This situation demands that educators present teaching materials that are more interactive and contextual, and able to accommodate the learning habits of the digital generation (Widianti et al., 2024).

In the subject of Sociology, these challenges become increasingly complex due to the conceptual, abstract characteristics of the material, which requires analytical skills for various social phenomena (Fifiana et al., 2024). Sociology learning is not only oriented towards mastering concepts, but also aims to form social awareness, critical attitudes, and sensitivity in students towards the dynamics of society (Ainy et al., 2024). Therefore, the presentation of Sociology material needs to be designed in such a way that it is easy to understand without reducing the depth of the substance being studied. Teaching materials that lack variety have the potential to cause students to have difficulty understanding important concepts, such as social structure, social differentiation, conflict, social change, and various other social phenomena (Amirudin & Zanthi, 2024).

Theoretically, the development of microlearning-assisted teaching materials is strongly grounded in constructivism and cognitive load theory. The constructivist perspective holds that students construct their understanding through active and meaningful learning experiences. In this process, students need opportunities to connect new information with prior knowledge (Bahari & Setiawan, 2024). Meanwhile, cognitive load theory explains that human working memory capacity is limited in processing information simultaneously. Presenting too much material at once can increase cognitive load, thus hindering comprehension (Ramdani & Amelia, 2024). Therefore, information presented in small, structured units is believed to be more effective in assisting the learning process.

One approach deemed relevant to addressing these challenges is microlearning. Microlearning is a learning strategy that presents material in small, focused units that can be learned quickly (Salzabila & Fathurrahman, 2024). Material can be packaged in various formats, such as short videos, infographics, interactive quizzes, podcasts, animations, and compact digital modules. These characteristics allow students to learn independently at their own pace and according to their individual needs (Pratiwi et al., 2024). In addition to increasing learning flexibility, microlearning also has the potential to strengthen information retention because students receive material gradually and repeatedly (Umar et al., 2024).

Previous research by Dewi et al., (2026) Studies have shown that microlearning can improve learning motivation, student engagement, and learning outcomes in various fields of study. The use of microlearning in higher education and professional training has been reported to provide a more effective learning experience because the material can be accessed anytime and anywhere through digital devices (Putra et al., 2024). Other research by NR Dewi & Maulida, (2023) Studies have also shown that microlearning can support



independent learning and increase student satisfaction with technology-based learning processes. However, most of these studies focus on specific disciplines, such as health, languages, business, and job skills training.

Grade XI Sociology requires the application of *microlearning* because it encompasses abstract, complex, and interconnected concepts, including social groups, social problems, conflict, violence, equality, and social integration. Mastery of these topics cannot be achieved merely by memorizing definitions; students must understand the relationships among concepts and apply them when analyzing social phenomena. Presenting content through lengthy, information-dense, and insufficiently contextualized explanations may increase students' cognitive load and make it difficult for them to identify key ideas. *Microlearning* can address this challenge by dividing the content into concise, structured learning units, each focusing on a specific concept or learning objective and incorporating case examples, visual illustrations, reflective questions, and brief exercises.

This structure enables students to process information incrementally, revisit content according to their individual needs, and progressively develop conceptual understanding. Nevertheless, research on the development of *microlearning*-based teaching materials for Sociology at the senior secondary level remains limited, as previous studies have tended to examine the general use of digital media without producing materials specifically designed around the characteristics of the Grade XI Sociology curriculum. Moreover, insufficient attention has been devoted to integrating learning outcomes, the complexity of sociological concepts, students' everyday contexts, and the learning habits of the digital generation. This gap underscores the need to develop *microlearning*-based teaching materials that do more than merely condense content; they must organize it systematically so that students can understand and critically analyze social realities.

Based on classroom observations, Grade XI Sociology instruction remains dominated by printed textbooks that present content through lengthy and relatively monotonous explanations. This condition may increase students' cognitive load, reduce their engagement, and limit opportunities for conceptual reinforcement within the available instructional time. This study aims to develop *microlearning*-based teaching materials, assess their feasibility through expert validation, and evaluate their practicality and acceptability based on teacher and student responses. Academically, this study extends the application of *microlearning* to Sociology education at the secondary-school level by demonstrating how content segmentation can organize abstract sociological concepts into concise, structured, and cognitively manageable learning units. The findings also strengthen the connection between digital instructional design and cognitive load theory while providing empirical support for developing teaching materials aligned with learning outcomes and the characteristics of students in the digital era.

Research Method

This study employed a Research and Development (R&D) method using the ADDIE model, which comprised the Analysis, Design, Development, Implementation, and Evaluation stages (Branch, 2009). This method was used to develop and evaluate *microlearning*-based teaching materials for Grade XI Sociology. During the analysis stage, the researchers identified instructional needs, student characteristics, learning outcomes, and challenges encountered by teachers. The design stage involved mapping the content, formulating learning objectives, selecting appropriate media formats, and preparing evaluation instruments. During the development stage, the initial design was transformed into a prototype, which was subsequently validated by experts and revised according to their

recommendations. The revised product was then implemented in a limited trial. Formative evaluation was conducted throughout the development process, while the final evaluation determined the product's feasibility, practicality, and acceptability.

The participants comprised three validators and the intended users of the product. The validators consisted of a Sociology subject-matter expert, an instructional media expert, and an instructional practitioner who taught Sociology at the senior secondary level. The limited trial involved 25 Grade XI students ($N = 25$), who were selected through purposive sampling because they had studied or were currently studying the topics covered by the developed materials. A Sociology teacher also participated in evaluating the materials' ease of implementation, time efficiency, instructional usefulness, and potential for continued use.

Data were collected through interview guides, observation sheets, document analysis, expert validation forms, and teacher and student response questionnaires. The subject-matter validation form assessed alignment with the intended learning outcomes, conceptual accuracy, language quality, and the meaningfulness of the content. The media validation form covered visual presentation, readability, navigation, design consistency, visual quality, and accessibility. Meanwhile, the instructional practitioner evaluated the product's suitability for classroom conditions and its potential for practical implementation.

The user-response questionnaires employed a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). The assessed dimensions included attractiveness, ease of use, clarity of content, perceived usefulness, learning motivation, and ease of implementation.

Data collection was conducted according to the stages of the ADDIE model. During the analysis stage, the researchers conducted classroom observations, interviews, and document analysis. The findings informed the design of microlearning units incorporating visual elements, conceptual summaries, reflective activities, and evaluation exercises. The initial product was subsequently submitted to the three validators for assessment. Following revisions based on their feedback, the teaching materials were used by students in a limited trial. Upon completing the trial, the students and teacher filled out response questionnaires and provided comments regarding their experiences with the product.

The expert-validation and questionnaire data were analyzed using descriptive statistics. The percentages of feasibility, practicality, and acceptability were calculated using the following formula:

$$P = \frac{\sum X}{\sum X_{max}} 100\%$$

where:

P represents the percentage score;

$\sum X$ represents the total empirical score obtained; and

$\sum X_{max}$ max represents the maximum possible score.

The mean score for each assessment dimension was calculated using the following formula:

$$\bar{X} = \frac{\sum X}{N}$$

where:

$\bar{X}$ represents the mean score;

$\sum X$ represents the sum of all scores; and

N represents the number of validators or respondents.

The resulting percentages were interpreted according to the criteria presented in the following table.

Table 1. Interpretation Criteria for Product Feasibility, Practicality, and Acceptability

Percentage interval	Feasibility criterion	Practicality and acceptability criterion
81–100%	Highly feasible	Excellent
61–80%	Feasible	Good
41–60%	Moderately feasible	Moderate
21–40%	Less feasible	Poor
≤20%	Not feasible	Very poor

Qualitative data obtained from interviews, observations, validator comments, and users' open-ended responses were analyzed through data reduction, data presentation, and conclusion drawing. The qualitative findings were used to explain the quantitative results and identify components of the product that required further refinement.

Results and Discussion

Analysis of the Needs for Developing Teaching Materials for Sociology Subjects for Grade XI with the Assistance of Microlearning.

Table 2. Results of the Analysis of the Needs for Developing Teaching Materials for Sociology Subjects for Grade XI with the Assistance of Microlearning

Aspects Analyzed	Field Findings	Implications for Development
Characteristic s of students	Students are accustomed to using smartphones, social media, and accessing information quickly and concisely through various digital platforms.	The material is developed in concise, focused microlearning units that can be studied independently in a short time.
Use of teaching materials	Learning is still dominated by printed textbooks and worksheets with minimal visual variation and not yet integrated with digital media.	More interactive digital teaching materials are needed through the integration of text, images, short videos, and interesting learning activities.
Student learning difficulties	Some students have difficulty understanding abstract sociological concepts, especially1282The material is delivered in long descriptions with limited learning time.	The presentation of the material is made simple, contextual, using examples of social phenomena that are close to the students' lives, and is equipped with visual reinforcement.
Teacher needs	Teachers need supporting learning media that are easy to operate, flexible for use in face-to-face and independent learning, and do not require complex technical skills.	The product is designed to be practical, easily accessible via digital devices, has simple navigation, and can be used according to learning needs.

Source: Results of analysis of interview data, observations, and documentation studies conducted by researchers (2026).

Based on the needs analysis results presented in Table 1, it can be concluded that there is a gap between the learning characteristics of students in the digital era and the teaching materials currently used in Sociology lessons. Students demonstrate a tendency to learn through concise, visual, and easily accessible information, while available teaching materials are still conventional. Furthermore, teachers also need innovative teaching materials that not only support the achievement of learning objectives but are also easily applicable in everyday learning practices.

Expert Validation Analysis of Products

Table 3. Product Eligibility Interpretation Criteria

Percentage (%)	Category
81–100	Very worthy
61–80	Worthy
41–60	Quite decent
21–40	Not worthy
≤20	Not feasible

Source: Modified from the interpretation criteria for the feasibility of developing teaching materials used in this study (Researcher, 2026).

Table 4. Summary of Expert Validation Results for Sociology Subject Teaching Materials for Grade XI Assisted by Microlearning

Validation Aspects	Percentage (%)	Category	Improvement Suggestions
Subject matter expert	92.50	Very worthy	Adding more current examples of social phenomena in accordance with students' lives and strengthening the reflection section at the end of the material.
Media expert	89.00	Very worthy	Improved font size consistency, improved the quality of some visual illustrations, and clarified navigation instructions.
Learning practitioners	94.00	Very worthy	Adding alternative short discussion activities and enriching the variety of social case-based evaluation questions.
Average	91.83	Very worthy	Revisions were made based on validator input to improve the quality and usability of the product.

Source: Results of data analysis validation by material experts, media experts, and learning practitioners processed by researchers (2026).

The quantitative findings in Table 4 were strengthened through qualitative analysis of the validators' comments and notes. Content experts emphasized the importance of presenting examples relevant to students' social realities to enhance meaningful learning. Media experts recommended improvements to several technical aspects to enhance user experience when accessing learning materials through digital devices. Meanwhile, learning practitioners assessed that the integration of reflective activities and case-based evaluations would strengthen students' analytical skills in understanding various social phenomena.

Product Revision Analysis

Table 5. Revision of Sociology Teaching Material Products for Grade XI with Microlearning Assistance Based on Validator Input

Aspect	Initial Conditions	Validator Input	Revision Results
Material	The material is in accordance with learning outcomes, but the social case examples are still general and not fully contextual.	Add examples of social phenomena that are current and close to students' lives and strengthen the reflection section on learning.	The material is equipped with the latest case studies, illustrations of social phenomena in the student's environment, and reflective questions in each microlearning unit.
Appearance	There are inconsistencies in font sizes and some visual illustrations have less than	Refining visual design, standardizing typography, and improving the quality of	The layout was improved with consistent use of font sizes, illustrations were

	optimal resolution.	images and infographics.	updated to be clearer, and infographics were adjusted to be more engaging.
Language	Some academic terms and explanatory sentences are still relatively long, potentially making things difficult for students.	Simplify language, improve sentence structure, and use more communicative terms according to the developmental level of students.	Sentences are structured more concisely, technical terms are given additional explanations, and language use is adapted to KBBI rules and the characteristics of high school students.
Navigation	Instructions for use are not yet explained in detail and transfer between materials still requires several additional steps.	Added user guides and simplified the navigation system to make it more accessible.	A user manual page is provided, navigation icons are clarified, and the flow of access between materials is made simpler and more intuitive.

Source: Results of product revision data analysis based on validation notes from material experts, media experts, and learning practitioners processed by researchers (2026).

Table 5 shows that the product revision process was carried out systematically, taking into account all input from the validators. Revisions to the material aspect aimed to increase the relevance and meaningfulness of Sociology learning, while improvements to the display were made to strengthen the visual appeal of the teaching materials. Language improvements were aimed at making it easier for students to understand the content, while navigation simplification aimed to increase the ease of independent use of the product.

Analysis of Student Responses to Microlearning-Assisted Teaching Materials

Table 6. Student Responses to the Microlearning-Based Teaching Materials for Grade XI Sociology (N = 25)

Assessment aspect	Mean	SD	Percentage (%)	Category
Attractiveness	4.66	0.20	93.20	Excellent
Ease of use	4.59	0.16	91.80	Excellent
Clarity of content	4.48	0.07	89.60	Excellent
Usefulness for conceptual understanding	4.62	0.18	92.40	Excellent
Learning motivation	4.54	0.09	90.80	Excellent
Overall	4.58	0.08	91.56	Excellent

Source: Results of the student-response questionnaire administered during the limited trial (2026).

As presented in Table 6, the students responded very positively to the developed teaching materials. Attractiveness received the highest score, indicating that the combination of concise content, visual illustrations, color, and simple learning activities created an engaging learning experience. Although clarity of content received the lowest score, it remained within the excellent category and showed relatively little variation across student responses. This result suggests that certain abstract sociological concepts may still require additional explanations or more concrete examples. The students' open-ended comments further indicated that summaries, brief exercises, and contextualized social cases helped them review the material independently. They also recommended adding videos and interactive illustrations to provide a more varied learning experience.

Analysis of Teacher Responses to Sociology Teaching Materials for Grade XI Assisted by Microlearning

Table 7. Teacher Response to the Microlearning-Based Teaching Materials for Grade XI Sociology (N = 1)

Assessment aspect	Mean	SD	Percentage (%)	Category
Alignment with learning outcomes	4.75	—	95.00	Excellent
Ease of implementation	4.60	—	92.00	Excellent
Efficiency of instructional time	4.50	—	90.00	Excellent
Usefulness for the instructional process	4.70	—	94.00	Excellent
Potential for continued use	4.65	—	93.00	Excellent
Overall	4.64	—	92.80	Excellent

Source: Results of the Sociology teacher-response questionnaire concerning the microlearning-based teaching materials (2026).

Table 7 shows that the teacher rated all aspects of the teaching materials as excellent. Alignment with learning outcomes received the highest score, indicating that the content, organization, and examples of social phenomena were consistent with the intended learning objectives for Grade XI Sociology. By contrast, efficiency of instructional time received the lowest score, although it remained within the excellent category. This finding suggests that presenting content in short learning units facilitated instructional management, but its implementation still required adequate devices, a stable internet connection, and appropriate time allocation. The teacher also reported that the appealing presentation, straightforward navigation, and flexible accessibility supported learning both inside and outside the classroom. The addition of short videos, game-based quizzes, and automated feedback features was recommended to improve the product's interactivity.

Integrated Analysis of Product Feasibility and Practicality

Table 8. Integration of Final Analysis Results of Development of Sociology Teaching Materials for Grade XI with Microlearning Assistance

Data source	Quantitative Results	Qualitative Findings	Interpretation
Expert validation	91.83%	The validator assessed that the material was in accordance with learning outcomes, the media design was attractive, and it was easy to apply in learning.	The product meets the criteria of being very suitable for use after undergoing revision and improvement.
Student responses	91.56%	Students stated that the teaching materials were more interesting, easy to understand, not boring, and helped them understand sociological concepts.	The product has excellent levels of practicality and acceptability from the perspective of primary users.
Teacher's response	92.80%	Teachers assess that the teaching materials are efficient to use, support active learning, and have the potential to be applied sustainably.	The product is considered very useful and applicable in classroom learning practices.
Overall integration	92.06%	All users gave positive responses to the content, appearance, ease of use, and benefits of the teaching materials.	The product was declared very suitable, practical, and very well received to support Sociology learning for class XI.

Source: Results of integrating expert validation data, student response questionnaires, teacher response questionnaires, interviews, observations, and open comments processed by researchers (2026).

Based on Table 7, the overall average product evaluation score reached 92.06%, which falls into the very good or very adequate category. This percentage indicates that the

microlearning-assisted teaching materials have met the quality indicators established in the development research, both in terms of material substance, media design, and implementation in learning.

The data integration results also yielded conclusions regarding three main aspects of the research. First, the process of developing teaching materials using the ADDIE model was able to produce products that were systematic, relevant to students' needs, and in accordance with the characteristics of Sociology learning in grade XI. Second, the level of product feasibility based on expert validation indicated that the teaching materials met the academic and technical standards required for use in learning. Third, the level of practicality and acceptability of the products based on student and teacher responses indicated that the microlearning-assisted teaching materials were easy to use, engaging, and beneficial in improving the quality of the learning process.

These findings demonstrate that the use of a microlearning approach not only addresses the needs of students accustomed to quick and flexible access to information, but can also be an innovative solution for teachers in managing learning more effectively. Presenting material in concise learning units allows students to learn independently at their own pace, while also helping teachers optimize the allocation of classroom time.

Discussion

The findings demonstrated that the microlearning-based teaching materials developed for Grade XI Sociology were rated as highly feasible by the validators and achieved excellent levels of practicality and acceptability among the teacher and students. These results may be attributed to the alignment among the product design, the characteristics of Sociology content, and students' learning needs in a digital environment (Firmansyah et al., 2023). Sociology encompasses abstract and interconnected concepts, including social groups, conflict, equality, social problems, and social integration. When these concepts are presented through lengthy explanations, students must retain multiple elements of information simultaneously in their working memory before understanding the relationships among them. The developed materials divided the content into smaller units containing specific objectives, contextual examples, summaries, and brief exercises (Yusuf et al., 2023). This structure enabled students to focus on one central idea, connect it with their prior knowledge, and subsequently progress toward more complex concepts.

This mechanism is consistent with cognitive load theory, which maintains that working-memory capacity is limited, whereas information organized in long-term memory can be processed as more integrated schemas (Hairani & Amini, 2023). Content segmentation does not necessarily reduce the intrinsic complexity of Sociology; instead, it organizes the presentation sequence so that the number of elements processed simultaneously remains manageable (Suciati & Putra, 2025). Concise sentences, straightforward navigation, and relevant illustrations may also reduce extraneous cognitive load arising from inefficient instructional design (Nurdin et al., 2023). Consequently, students can allocate more mental resources to schema construction, case comparison, and reasoning about relationships among social phenomena. This explanation is consistent with Manurung & Sirait, (2023), argument that educational technology provides pedagogical benefits when its design helps manage the limitations of working memory rather than merely transferring printed content to a digital platform.

The high level of student acceptance may also be explained by the degree of learner control afforded by the microlearning format. Students could regulate their learning pace, revisit units they had not fully understood, and access the content at times appropriate to their individual needs (Br Tambunan et al., 2023). Such control supported self-regulated learning



because the learning process did not depend entirely on the teacher's explanation during a single classroom session. The summaries and exercises included in each unit served as reinforcement and provided opportunities for information retrieval. Repetition and retrieval helped students retain information while connecting theoretical concepts with social examples encountered in everyday life. Visual appeal also played a role in directing attention, although its benefits depended on the relevance of each element to the learning objectives. Illustrations or animations serving merely decorative purposes could increase cognitive load (Waringin et al., 2023). Therefore, the positive reception of the product's visual presentation should be understood as the result of integrating visual appeal, functional imagery, and structural clarity rather than as a consequence of technology use alone.

These findings are consistent with international literature indicating that microlearning can support engagement, flexibility, retention, and efficient information processing. A review Denojean-Mairet et al., (2024) explained that complex content could be divided into focused units, distributed over time, and revisited through short learning sessions. However, the review also cautioned that microlearning might be insufficient for developing complex skills, processes, or ideas when its individual units are isolated and lack conceptual continuity. In the present study, the risk of fragmentation was addressed by mapping the materials according to learning outcomes, conceptual sequences, social cases, reflective activities, and evaluation tasks. The product's contribution, therefore, lay not merely in shortening learning sessions but also in systematically organizing relationships among concepts across a coherent learning pathway (Phakamach et al., 2025).

The findings also correspond with global studies examining microlearning in higher education, professional education, skills development, and mobile learning. Luo & Li, (2025) found that microlearning could reduce intrinsic and extraneous cognitive load while directing cognitive resources toward activities relevant to knowledge construction. Their study also emphasized the importance of scenario-based exercises in helping learners apply knowledge to authentic situations (Oktavianti et al., 2020). A similar pattern was evident in the use of social cases and reflective questions in the materials developed in this study. Nevertheless, most international research has focused on university students, professionals, health education, language learning, or vocational training (Panjaitan et al., 2022). The present study extends the application of microlearning to secondary education and Sociology, a discipline that requires students not only to remember information but also to interpret social relationships, consider multiple perspectives, and develop critical analysis (Yani et al., 2023).

This comparison also highlights the limits within which the findings should be interpreted. Expert assessments and user responses demonstrated that the product was feasible, practical, and acceptable, but they did not establish that its use causally improved learning outcomes, long-term retention, or critical-thinking skills. Positive responses may have been influenced by novelty, visual appeal, or the perceived differences between the product and the textbooks ordinarily used by students (Desmaiyanti & Sugiman, 2023). Several international studies have similarly reported that increased motivation following microlearning interventions was not always accompanied by comparable improvements in learning outcomes (Sinambela et al., 2023). Moreover, much of the existing microlearning research has relied on perception surveys and short-term evaluations; consequently, evidence concerning knowledge transfer and deep understanding remains inconclusive (Zebua et al., 2022). Thus, the present study supports the product's pedagogical feasibility, but claims regarding its effectiveness should be examined through experimental designs involving pre- and post-intervention measurements, comparison groups, and retention tests.

Theoretically, this study extends the application of cognitive load theory to social science education. Cognitive load in Sociology learning does not arise solely from the amount of information presented but also from the requirement to understand relationships among concepts, contexts, actors, values, and social changes (Sumarni et al., 2022). Well-designed microlearning functions as a mechanism for sequencing complexity: students first understand individual conceptual units, then compare relevant examples, and finally integrate multiple concepts when analyzing social cases (Laila & Asrizal, 2021). The findings indicate that the size of a learning unit is not the only principle determining its effectiveness. Coherence among units, the relevance of examples, appropriate reinforcement, and alignment with learning objectives are equally important. Microlearning should therefore be positioned as an instructional architecture that manages information flow and schema construction rather than merely as a strategy for shortening texts or videos.

From a practical perspective, teachers can use microlearning units as preparatory resources before instruction, discussion prompts during classroom activities, or reinforcement and remedial materials after instruction (Sitanggang et al., 2022). A unit on social conflict, for example, could begin with a brief case, proceed to the identification of relevant actors and causal factors, and subsequently connect these elements with conflict theory through classroom discussion. This pattern would allow face-to-face instructional time to be devoted to argumentation, clarification, and analysis, while students could acquire basic conceptual knowledge independently (Rusilowati et al., 2020). Nevertheless, teachers retain a central role in helping students integrate smaller units into a coherent understanding. Schools should also ensure access to appropriate devices and internet connectivity, provide training in digital instructional design, and offer offline alternatives so that product implementation does not exacerbate the digital divide (Suharti et al., 2020).

Overall, this study indicates that the success of microlearning-based teaching materials depends on the alignment of content segmentation, cognitive load management, social-context relevance, and accessibility. The developed product has the potential to bridge the abstract nature of Sociology content and students' learning patterns in the digital era without diminishing the analytical depth that characterizes the discipline. The principal implication is that instructional innovation should not be evaluated solely according to its use of digital media but also by its capacity to direct attention, organize complexity, and facilitate understanding. Future research should evaluate the product's effectiveness using larger samples, compare it with conventional teaching materials, measure cognitive load directly, and assess the long-term retention and transfer of social-analysis skills.

Conclusion

This study concludes that the microlearning-based teaching materials developed for Grade XI Sociology were highly feasible, practical, and well accepted by both students and the teacher. Presenting the content in concise, structured, and contextualized units helped students focus on key ideas before connecting them with related concepts. This approach made abstract topics—including social groups, conflict, equality, social problems, and social integration—more accessible by linking them to phenomena relevant to students' everyday lives. Summaries, visual illustrations, reflective questions, and brief exercises also supported independent review and enabled students to develop their understanding progressively without being exposed to excessive information. Nevertheless, the findings demonstrate the product's feasibility and acceptability rather than providing causal evidence of improved learning outcomes.

In practical terms, teachers can use these materials as preparatory resources before



lessons, prompts for case analysis during classroom activities, or reinforcement and remedial resources after instruction. Their use allows classroom time to shift from delivering basic information toward discussion, argumentation, and in-depth analysis of social phenomena. Sustainable implementation requires teacher guidance to ensure that the individual learning units remain conceptually interconnected, along with adequate devices, internet access, and offline alternatives. Future research should examine the product's effectiveness in improving learning outcomes, reducing cognitive load, strengthening critical-thinking skills, and supporting long-term retention among larger and more diverse samples.

Recommendation

Sociology teachers are encouraged to use microlearning-based teaching materials for preparation, reinforcement, and remediation while connecting each unit with discussions and case analyses to prevent fragmented understanding. School policymakers should provide appropriate devices, reliable internet connectivity, offline access alternatives, digital instructional design training, and periodic evaluation mechanisms to ensure inclusive and sustainable implementation. Future researchers should examine the product's effectiveness using experimental designs involving larger samples and comparison groups while assessing learning outcomes, cognitive load, critical-thinking skills, and long-term retention. Further studies should also consider differences in student characteristics, school contexts, geographical settings, and local digital infrastructure.

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