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# The Effect of Gen Z Digital Language-Integrated Microlearning Videos on Vocabulary Retention among Indonesian EFL Learners

**Nadia Khairun Nisa[1], Daniar Sofeny[2], Irmayani[3]**
[1,2,3]Universitas Islam Darul Ulum Lamongan, Indonesia
Email: nadiakhairun.2022@mhs.unisda.ac.id[1], daniarsofeny@unisda.ac.id[2], irmayani@unisda.ac.id[3]

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***Keywords:*** *EFL learners, Gen Z digital language, microlearning videos, short-term vocabulary retention, vocabulary learning.*

***Abstract:*** *Vocabulary retention remains a persistent challenge in English as a Foreign Language (EFL) learning, particularly when vocabulary instruction relies primarily on memorization and decontextualized word lists. This study investigated the effect of Gen Z digital language-integrated microlearning videos on Indonesian EFL learners' vocabulary retention. A quantitative quasi-experimental design with a non-equivalent control group design was employed involving 30 eleventh-grade Indonesian EFL learners from a private vocational high school in Lamongan, East Java, Indonesia. The participants were assigned to an experimental group (n = 15) and a control group (n = 15) through purposive sampling. The experimental group received vocabulary instruction through two- to three-minute microlearning videos integrating Gen Z digital language features, including informal digital expressions, abbreviations, emojis, contextual examples, and visual illustrations, whereas the control group received conventional vocabulary instruction. Vocabulary knowledge was measured using a pre-test, post-test, and delayed post-test administered seven days after the intervention. Because the data violated the assumptions of normality and homogeneity, the Mann–Whitney U test and Wilcoxon signed-rank test were employed for data analysis. The findings revealed that the experimental group showed significant improvement from the pre-test to the post-test and maintained relatively stable performance on the seven-day delayed post-test, indicating effective short-term vocabulary retention. Significant differences were also observed between the experimental and control groups in the post-test and delayed post-test. However, the significant baseline difference identified in the pre-test suggests that these findings should be interpreted with caution. Overall, the results indicate that Gen Z digital language-integrated microlearning videos have the potential to support vocabulary learning and short-term vocabulary retention among Indonesian EFL learners.*

## INTRODUCTION

Vocabulary retention is a fundamental aspect of English as a Foreign Language (EFL) learning because vocabulary knowledge enables learners to comprehend texts, communicate ideas effectively, and participate in meaningful language use. However, acquiring new vocabulary is insufficient unless learners are able to retain and retrieve lexical knowledge after instruction. Vocabulary retention refers to learners' ability to store, recall, and use previously learned words over time, making it an essential indicator of successful vocabulary learning. According to (Nation, 2022). vocabulary development requires repeated exposure, meaningful contexts, and opportunities for retrieval to strengthen long-term lexical knowledge. Similarly, (Schmitt, 2019) argues that vocabulary acquisition is a gradual process in which repeated encounters and deep cognitive processing contribute to durable word learning rather than temporary memorization. These perspectives suggest that vocabulary instruction should not only emphasize vocabulary acquisition but also facilitate learners' ability to retain vocabulary beyond immediate classroom activities. Recent studies also emphasize that retrieval practice and repeated contextual exposure significantly improve vocabulary retention by strengthening long-term lexical memory (Laufer & Vaisman, 2023)

Despite its importance, vocabulary instruction in many Indonesian EFL classrooms continues to rely on conventional approaches such as translation, memorization, word lists, and written exercises. Although these methods may help students recognize vocabulary immediately after instruction, they often provide limited opportunities for meaningful processing and repeated retrieval, resulting in poor vocabulary retention. (Sofeny & Muamanah, 2021) found that students frequently forgot newly learned vocabulary when instruction lacked memory-supportive strategies, indicating that vocabulary learning depends not only on the number of words introduced but also on how learning activities promote attention, meaningful associations, and recall. Consequently, there is a need for instructional approaches that facilitate both vocabulary acquisition and retention through engaging and cognitively supportive learning experiences.

One promising approach involves integrating media into vocabulary instruction. Audiovisual materials provide contextualized input that combines verbal and visual information, enabling learners to establish stronger associations between word forms and meanings. In the Indonesian EFL context, (Shoutin et al., 2025) reported that Japanese anime subtitles improved students' vocabulary mastery by presenting vocabulary through meaningful audiovisual contexts that increased learners' motivation and comprehension. Likewise (Rindi & Sofeny, 2025) found that English songs enhanced vocabulary learning by exposing students to authentic language in familiar and enjoyable contexts. These studies demonstrate that media-based instruction can enrich vocabulary learning by increasing learner engagement and providing contextual support. However, previous studies have primarily focused on commercial media such as songs and anime rather than instructional media specifically designed to reflect students' everyday digital communication practices. Recent evidence also indicates that multimedia-supported vocabulary instruction facilitates vocabulary acquisition and retention by integrating verbal and visual information that promotes deeper cognitive processing and meaningful lexical associations (Teng & Zhang, 2023)

For Generation Z learners, digital communication has become an inseparable part of daily life. Students regularly interact through social media platforms using abbreviations, emojis, internet slang, memes, captions, and other forms of digital language. These linguistic practices influence how learners interpret meaning, express identity, and communicate within their communities. (Gee, 2021) explains that language is closely connected to social identity and participation in discourse communities, while (Tagg & Seargeant, 2020b) argue that digital communication represents meaningful social interaction rather than merely informal language use.

From this perspective, Gen Z digital language can be viewed as a pedagogical resource that bridges students' everyday communication experiences with formal English learning. Integrating familiar digital expressions into vocabulary instruction may increase learners' attention, engagement, and meaningful processing by connecting new vocabulary with contexts that are already familiar to them. Recent studies on digital communication further suggest that learners' everyday online language practices can serve as valuable pedagogical resources for creating authentic and meaningful learning experiences in EFL classrooms, particularly for Generation Z learners who frequently communicate through social media platforms (Sundqvist & Uztosun, 2024)

The integration of Gen Z digital language becomes increasingly meaningful when combined with microlearning. Microlearning delivers instructional content in short, focused learning units that reduce cognitive overload while maintaining learners' attention. According to (Sweller, 2011) Cognitive Load Theory, instructional materials should minimize unnecessary cognitive demands so that learners can process new information more efficiently. (Taylor & Hung, 2022) further explain that microlearning facilitates learning by presenting concise content that can be processed within a limited period, making it particularly suitable for digital-native learners. In addition, (Mayer, 2009) Cognitive Theory of Multimedia Learning suggests that learners achieve better understanding when verbal and visual information are presented simultaneously through coordinated multimedia. Therefore, microlearning videos integrating Gen Z digital language may provide contextualized, multimodal vocabulary input that supports vocabulary learning while reducing cognitive load. Similarly, (Buchem et al., 2021) argues that microlearning facilitates flexible, learner-centered instruction through short and focused digital learning units, while (Hug, 2015; Thillainadesan et al., 2022), highlights its effectiveness in supporting sustained engagement and knowledge retention. Similarly, (Buchem et al., 2021) argues that microlearning supports learner autonomy through short, focused instructional units, while recent studies also highlight its potential to improve vocabulary retention when combined with retrieval practice and spaced learning activities (Tanashur et al., 2025). This instructional approach is also consistent with recent findings that multimedia-assisted microlearning promotes higher learner engagement and facilitates vocabulary retention by presenting learning materials in cognitively manageable segments (Teng & Zhang, 2023)

Although previous studies have demonstrated the effectiveness of audiovisual media, English songs, anime subtitles, and other technology-assisted learning resources in improving vocabulary learning, limited research has investigated the integration of Gen Z digital language into instructional microlearning videos specifically designed to enhance vocabulary retention among Indonesian EFL learners. Furthermore, existing studies have primarily focused on immediate vocabulary achievement rather than examining learners' ability to retain newly acquired vocabulary after a delayed period. Considering that vocabulary retention reflects the sustainability of learning beyond immediate instructional outcomes, further investigation is needed to explore instructional approaches that facilitate both vocabulary learning and retention in authentic EFL classrooms.

Therefore, this study contributes both theoretically and pedagogically. Theoretically, it extends the application of Cognitive Load Theory (Sweller, 2011) and the Cognitive Theory of Multimedia Learning (Mayer, 2009) by examining how Gen Z digital language can be integrated into microlearning videos to support vocabulary retention among Indonesian EFL learners. Pedagogically, it proposes contextualized Gen Z digital language-integrated microlearning videos as an alternative vocabulary learning strategy that incorporates learners' everyday digital communication practices into English instruction.

Accordingly, this study investigates the effect of Gen Z digital language-integrated

microlearning videos on Indonesian EFL learners' vocabulary retention. Specifically, it compares the vocabulary performance of learners who received instruction through Gen Z digital language-integrated microlearning videos with those who received conventional vocabulary instruction using pre-test, post-test, and a seven-day delayed post-test. The findings are expected to contribute to the growing body of research on technology-enhanced vocabulary learning by providing empirical evidence regarding the potential of contextualized microlearning videos to support short-term vocabulary retention in Indonesian EFL classrooms.

## LITERATURE REVIEW

### Vocabulary Retention

Vocabulary retention refers to learners' ability to maintain, retrieve, and appropriately use previously learned vocabulary after a period of instruction. Unlike vocabulary achievement, which measures immediate learning outcomes, vocabulary retention emphasizes the sustainability of lexical knowledge over time. (Nation, 2022) explains that vocabulary knowledge develops through repeated encounters, meaningful contexts, and opportunities for retrieval, enabling learners to strengthen the connections between word form, meaning, and use. Likewise, (Schmitt, 2019) argues that vocabulary acquisition is a gradual process requiring repeated exposure and deep cognitive processing to achieve durable learning. Therefore, effective vocabulary instruction should encourage learners not only to recognize new words but also to retain and retrieve them beyond immediate classroom activities.

However, vocabulary retention remains a challenge in many EFL classrooms because instruction frequently emphasizes memorization, translation, and isolated vocabulary lists. Although these approaches may improve immediate vocabulary recognition, they often provide limited opportunities for meaningful processing and retrieval practice. (Sofeny & Muamanah, 2021) demonstrated that learners who received memory-supportive instructional strategies showed better vocabulary retention than those relying solely on conventional memorization techniques. Their findings indicate that vocabulary retention is influenced by how instructional activities support attention, meaningful association, and repeated retrieval rather than simply increasing the number of vocabulary items introduced. Recent empirical studies indicate that retrieval practice, repeated or spaced exposure, and contextualized vocabulary learning significantly enhance vocabulary retention among EFL learners (Ahoomanesh et al., 2024; Teng, 2024)

### Gen Z Digital Language in EFL Learning

Generation Z learners are frequently exposed to digital communication through social media, online messaging, and various digital platforms. Their daily communication often involves abbreviations, emojis, internet slang, hashtags, memes, and short-form digital expressions that represent meaningful social interaction rather than merely informal language use. (Gee, 2021) argues that language functions as a social practice through which individuals construct identity and participate in discourse communities. Similarly, (Tagg & Seargeant, 2020a) explain that digital language reflects evolving communication practices shaped by technological environments and social interaction.

Within EFL learning, these digital communication practices can serve as familiar contextual resources that connect academic vocabulary with learners' everyday experiences. Rather than replacing standard English, Gen Z digital language may function as a pedagogical scaffold that facilitates comprehension, increases engagement, and supports vocabulary recall through familiar contexts. Familiar digital expressions can activate learners' prior knowledge, reduce the cognitive distance between formal vocabulary and daily communication, and encourage more meaningful

vocabulary processing.

Learner engagement also plays an important role in successful vocabulary learning (Irmayani & Masruro, 2023) found that supportive classroom interaction encouraged greater learner participation and responsiveness in EFL classrooms. Their findings suggest that students are more actively involved when learning activities are meaningful and closely related to their experiences. Integrating Gen Z digital language into instructional media may therefore increase students' attention and participation, creating more favorable conditions for vocabulary learning and retention. Recent research also highlights that digital communication practices provide authentic linguistic resources that can enhance learners' engagement and contextual understanding in language classrooms (Sundqvist & Sylvén, 2016). Likewise, interactive vocabulary-learning strategies that encourage active learner participation have been shown to significantly improve vocabulary mastery, indicating that engaging and learner-centered approaches are essential for effective vocabulary acquisition (Sari et al., 2025)

**Videos for Vocabulary Learning**

Microlearning is an instructional approach that delivers learning content in short, focused, and manageable learning units. Unlike conventional lessons that often present large amounts of information simultaneously, microlearning organizes instructional materials into concise segments that allow learners to concentrate on a limited number of learning objectives during each session. (Taylor & Hung, 2022) explain that microlearning is particularly effective in digital learning environments because learners can access short instructional materials repeatedly according to their learning needs.

In vocabulary instruction, microlearning videos provide opportunities to combine verbal explanations, visual illustrations, contextual examples, pronunciation models, and authentic language use within a single instructional resource. Such multimodal presentation enables learners to process vocabulary through multiple channels, strengthening lexical representation and supporting memory formation.

Previous studies have shown that media-based instruction contributes positively to vocabulary learning. (Shoutin et al., 2025) reported that Japanese anime subtitles enhanced students' vocabulary mastery by providing contextual audiovisual input that increased learners' motivation and comprehension. Similarly, (Rindi & Sofeny, 2025) found that English songs facilitated vocabulary learning because authentic audiovisual input promoted learners' interest and contextual understanding. Although these studies demonstrate the benefits of media-based vocabulary instruction, they primarily utilized existing commercial media. Limited research has explored instructional videos specifically designed by integrating Gen Z digital language into microlearning materials to support vocabulary retention among Indonesian EFL learners. (Buchem et al., 2021) further explains that microlearning enables learners to engage with concise instructional content flexibly and repeatedly, while (Tanashur et al., 2025) demonstrate that integrating microlearning with retrieval-based activities contributes to improved vocabulary retention.

**Theoretical Framework: Cognitive Load Theory and Multimedia Learning**

This study is grounded in Cognitive Load Theory and the Cognitive Theory of Multimedia Learning. Cognitive Load Theory proposed by (Sweller, 2011) suggests that instructional materials should minimize unnecessary cognitive load to optimize working memory capacity. Learning becomes more effective when information is presented in manageable segments that reduce cognitive overload and allow learners to focus on essential information. Microlearning aligns with

this principle because it presents vocabulary in short instructional units that are easier for learners to process and remember.

In addition (Mayer, 2009) Cognitive Theory of Multimedia Learning explains that meaningful learning occurs when learners process verbal and visual information simultaneously through coordinated multimedia presentation. Learning materials that combine narration, written text, images, animations, and contextual examples enable learners to build stronger mental representations than single-mode instruction. In the present study, Gen Z digital language-integrated microlearning videos combine multimedia elements with familiar digital communication features, including abbreviations, emojis, contextual captions, and digital expressions. This integration is expected to enhance learners' attention, facilitate meaningful vocabulary processing, and support short-term vocabulary retention by connecting new lexical knowledge with familiar communicative contexts.

Based on these theoretical perspectives and previous empirical findings, the present study investigates whether Gen Z digital language-integrated microlearning videos can support Indonesian EFL learners' vocabulary retention more effectively than conventional vocabulary instruction.

## METHODS

This study employed a quantitative approach using a quasi-experimental non-equivalent control group design to investigate the effect of Generation Z digital language integrated microlearning videos on EFL students' vocabulary retention. The participants were 30 eleventh-grade students from SMK NU 1 Kedungpring, Indonesia, selected through purposive sampling. Two intact classes participated in the study: one experimental group (n = 15) and one control group (n = 15).

The experimental group received vocabulary instruction through short microlearning videos integrating Generation Z digital language features, including slang, abbreviations, emojis, internet expressions, contextual examples, pronunciation, and visual illustrations. The control group learned the same vocabulary topics through conventional teacher-centered instruction using vocabulary lists, explanations, and written exercises. Both groups studied identical vocabulary themes and received the same instructional duration.

Students completed a pre-test before the treatment, an immediate post-test after four instructional sessions, and a delayed post-test administered seven days later to measure vocabulary retention. Each test consisted of 25 multiple-choice items with equivalent content and varying item order to minimize memorization effects. The data were analyzed using descriptive statistics, the Shapiro–Wilk normality test, Levene's homogeneity test, the Mann–Whitney U test, the Wilcoxon signed-rank test, vocabulary retention rate analysis, and rank-biserial correlation using Jamovi software.

## RESULT AND DISCUSSION

### Results

### Descriptive Statistics

Table 1 presents the descriptive statistics of the vocabulary test scores for both groups across the three measurement occasions.

**Table 1. Descriptive Statistics of Vocabulary Scores**

| Kelas | Test | N | Missing | Mean | Median | SD | Min. | Max. |
|---|---|---|---|---|---|---|---|---|
| XI-A | Pre-test | 15 | 0 | 96,27 | 96,00 | 4,89 | 84 | 100 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| XI-A | Post-test | 15 | 0 | 99,47 | 100,00 | 1,41 | 96 | 100 |
| XI-A | Delayed post-test | 15 | 0 | 99,20 | 100,00 | 2,24 | 92 | 100 |
| XI-B | Pre-test | 15 | 0 | 73,60 | 84,00 | 27,62 | 24 | 100 |
| XI-B | Post-test | 15 | 0 | 85,87 | 96,00 | 21,85 | 36 | 100 |
| XI-B | Delayed post-test | 15 | 0 | 91,20 | 100,00 | 20,35 | 20 | 100 |

***Note:*** *Class XI-A was the experimental group, while Class XI-B was the control group. Each group included 15 students, and no missing data were recorded. The statistics were obtained from the Jamovi output.*

The experimental group demonstrated consistently higher vocabulary scores than the control group across all testing occasions. The mean score increased from 96.27 in the pre-test to 99.47 in the post-test and remained relatively stable at 99.20 in the delayed post-test. In contrast, the control group showed gradual improvement from 73.60 to 85.87 and 91.20, respectively. The small standard deviations in the experimental group indicate that students' scores were clustered near the maximum score, whereas the larger standard deviations in the control group reflect greater variability in students' performance. These descriptive findings suggest the presence of a ceiling effect in the experimental group and a non-normal distribution of scores.

## Normality and Homogeneity Tests

**Table 2. Shapiro-Wilk Normality Test by Group**

| Paired Comparison | Difference Tested | Shapiro–Wilk W | p-value | Interpretation |
|---|---|---|---|---|
| Experimental Group | Post-test − Pre-test | 0.838 | .012 | Not normally distributed |
| Experimental Group | Delayed − Post-test | 0.484 | < .001 | Not normally distributed |
| Control Group | Post-test − Pre-test | 0.947 | .472 | Normally distributed |
| Control Group | Delayed − Post-test | 0.784 | .002 | Not normally distributed |

**Note:** *The Shapiro–Wilk test was performed on the paired difference scores because the normality assumption for the Wilcoxon signed-rank test should be assessed using the differences between paired observations. A p-value below .05 indicates that the difference scores are not normally distributed.*

As shown in Table 2, the paired difference scores were not normally distributed in all cases. Both difference scores in the experimental group were not normally distributed ($p < .05$). In the control group, the Post-test − Pre-test difference score was normally distributed ($p = .472$), whereas the Delayed − Post-test difference score was not ($p = .002$). Because the assumption of normality was not satisfied for all paired difference scores, the Wilcoxon signed-rank test was selected for within-group comparisons.

**Table 3. Homogeneity of Variances Tests**

| Variabel | Test | F / Ratio | df1 | df2 | p |
|---|---|---|---|---|---|
| Delayed post-test | Levene's test | 4,66 | 1 | 28 | 0,040 |
| | Variance ratio | 0,01214 | 14 | 14 | < 0,001 |
| Pre-test | Levene's test | 24,29 | 1 | 28 | < 0,001 |
| | Variance ratio | 0,03136 | 14 | 14 | < 0,001 |
| Post-test | Levene's test | 27,71 | 1 | 28 | < 0,001 |
| | Variance ratio | 0,00415 | 14 | 14 | < 0,001 |

***Note:*** The variance assumption was violated for the pre-test, post-test, and delayed post-test.

Homogeneity of variance was examined using Levene's test. As presented in Table 3, the variance assumption was violated for the pre-test ($F = 24.29$, $p < .001$), post-test ($F = 27.71$, $p < .001$), and delayed post-test ($F = 4.66$, $p = .040$). These findings further supported the use of non-parametric statistical analyses in the subsequent comparisons.

**Between-Group Comparison**

The Mann–Whitney U test was conducted to compare vocabulary scores between the experimental and control groups.

**Table 4. Mann-Whitney U Test Results and Rank-Biserial Effect Sizes**

| Testing Occasion | Mann–Whitney U | p | Absolute Rank-Biserial Correlation | Effect Magnitude | Decision |
|---|---|---|---|---|---|
| Pre-test | 49,00 | 0,007 | 0,564 | Large | Significant |
| Post-test | 62,50 | 0,014 | 0,444 | Moderate | Significant |
| Delayed post-test | 72,00 | 0,040 | 0,360 | Moderate | Significant |

***Note:*** *A result was considered statistically significant when $p < .05$. The absolute values of the rank-biserial correlations were used to interpret the magnitude of the between-group differences because the direction of the coefficient depended on the order in which the groups were entered into the statistical software. The experimental group obtained higher descriptive scores at all three testing occasions.*

The pre-test comparison revealed a statistically significant difference between the two groups ($U = 49.00$, $p = .007$), indicating that the experimental group already had significantly higher vocabulary knowledge before the treatment. Following the intervention, significant differences were also observed in the post-test ($U = 62.50$, $p = .014$) and delayed post-test ($U = 72.00$, $p = .040$). However, because the two groups differed significantly at baseline, the post-treatment differences should be interpreted cautiously and cannot be attributed solely to the instructional treatment.

**Within-Group Comparison**

Changes in vocabulary scores within each group were analyzed using the Wilcoxon signed-rank test.

**Table 5. Wilcoxon Signed-Rank Test for the Experimental Group**

| Paired Comparasion | N | W | p | Positive Ranks | Negative Ranks | Ties | Decision |
|---|---|---|---|---|---|---|---|
| Pre-test vs. Post-test | 15 | 0,0 | 0,014 | 7 | 0 | 8 | Significant |
| Post-test vs. Delayed post-test | 15 | 1,0 | 0,655 | 1 | 1 | 13 | Not Significant |

***Note:*** *The Wilcoxon signed-rank test involved the same 15 students in the experimental group. Positive ranks indicate that the score at the second measurement was higher than the score at the first measurement. A result was considered statistically significant when $p < .05$.*

**Table 6. Wilcoxon Signed-Rank Test for the Control Group**

| Paired Comparasion | N | W | p | Positive Ranks | Negative Ranks | Ties | Decision |
|---|---|---|---|---|---|---|---|
| Pre-test vs. Post-test | 15 | 31,0 | 0,310 | 8 | 5 | 2 | Not Significant |
| Post-test vs. Delayed post-test | 15 | 11,0 | 0,324 | 5 | 3 | 7 | Not Significant |

***Note:*** *The Wilcoxon signed-rank test involved the same 15 students in the control group. Positive ranks indicate that the score at the second measurement was higher than the score at the first measurement. A result was considered statistically significant when $p < .05$.*

The experimental group demonstrated a statistically significant improvement from the pre-test to the post-test ($W = 0.00$, $p = .014$). No significant difference was found between the post-test and delayed post-test ($W = 1.00$, $p = .655$), indicating that students maintained their vocabulary performance during the seven-day retention interval. In contrast, the control group showed no statistically significant changes between either measurement occasion ($p > .05$).

## Vocabulary Retention

Vocabulary retention was calculated by comparing the delayed post-test mean with the post-test mean.

**Table 7. Vocabulary Retention Ratio**

| Group | N | Post-test mean | Delayed mean | Retention ratio | Interpretation |
|---|---|---|---|---|---|
| Experimental | 15 | 99.47 | 99.20 | 99.73% | High and stable retention |
| Control | 15 | 85.87 | 91.20 | 106.21% | The delayed exceeded the post-test mean |

*Note. Retention ratio = (delayed post-test mean / post-test mean) x 100%. A value above 100% indicates that the delayed post-test mean was higher than the post-test mean; it does not mean that more than 100% of the vocabulary was retained.*

The experimental group retained 99.73% of its post-test performance, indicating very stable vocabulary retention during the seven-day interval. The control group produced a retention ratio of 106.21% because its delayed post-test mean exceeded its post-test mean. This value reflects an increase in the group average rather than retention exceeding 100% and therefore should be interpreted cautiously. Overall, although both groups maintained their scores during the delayed measurement, the experimental group consistently achieved higher vocabulary performance throughout the study.

## Discussion

The findings of this study indicate that Gen Z digital language-integrated microlearning videos contributed to improving Indonesian EFL learners' vocabulary performance and maintaining their vocabulary knowledge over a seven-day retention period. Students in the experimental group achieved significantly higher vocabulary scores after the intervention and maintained relatively stable performance on the delayed post-test. These findings suggest that presenting vocabulary through short, contextualized, and visually supported microlearning videos may facilitate vocabulary learning by increasing learners' engagement and reducing cognitive load during instruction.

Although the experimental group demonstrated significantly higher scores than the control group in both the post-test and delayed post-test, the significant difference observed in the pre-test indicates that the two groups were not equivalent before the intervention. Consequently, the post-treatment differences should be interpreted cautiously, as they may reflect both the instructional treatment and the learners' initial vocabulary proficiency. Nevertheless, the Wilcoxon signed-rank analysis showed that only the experimental group experienced a significant improvement from the pre-test to the post-test, while the control group did not exhibit statistically significant gains. This finding suggests that the microlearning videos provided additional learning benefits beyond conventional vocabulary instruction.

The practical significance of these findings is further supported by the rank-biserial correlation values obtained from the Mann–Whitney U test. The post-test and delayed post-test comparisons yielded moderate effect sizes, indicating that the observed differences between the experimental and control groups were not only statistically significant but also educationally meaningful. Although the significant baseline difference limits causal interpretation, the moderate effect sizes suggest that integrating Gen Z digital language into microlearning videos may provide practical benefits for supporting vocabulary learning and short-term vocabulary retention among Indonesian EFL learners.

The stability of the experimental group's delayed post-test scores further indicates that the instructional approach supported learners in retaining newly acquired vocabulary over a short period. The combination of concise instructional videos, contextual examples, visual representations, and familiar Gen Z digital language may have enhanced encoding and retrieval processes, enabling learners to recall vocabulary more effectively after the learning sessions. These findings support previous studies suggesting that microlearning facilitates vocabulary acquisition by delivering information in manageable segments while maintaining learner attention and motivation.

However, it is important to interpret the vocabulary retention findings within the scope of this study. The delayed post-test was administered seven days after the intervention; therefore, the results reflect short-term vocabulary retention rather than long-term retention. Although the experimental group successfully maintained its vocabulary performance during this period, the study does not provide evidence regarding whether the retained vocabulary would remain stable over longer intervals, such as several weeks or months. Consequently, the findings should be interpreted as demonstrating the effectiveness of Gen Z digital language-integrated microlearning videos in supporting immediate learning outcomes and short-term vocabulary retention.

These findings also have several pedagogical implications. For English teachers, integrating microlearning videos that incorporate authentic digital language familiar to Gen Z learners may increase classroom engagement while providing meaningful vocabulary exposure in contexts that closely resemble students' daily communication. Rather than replacing conventional instruction, such videos may serve as complementary learning materials that reinforce vocabulary practice both inside and outside the classroom. Their short duration and accessibility also make them suitable for blended learning or independent learning activities.

From a research perspective, this study provides a foundation for future investigations into technology-enhanced vocabulary learning among EFL learners. Since the present study measured vocabulary retention over only a seven-day interval, future researchers are encouraged to examine long-term vocabulary retention by administering delayed post-tests after several weeks or months. In addition, future studies may involve larger and more diverse participant groups, apply randomized experimental designs to improve group equivalence, and explore other language skills or different forms of digital learning media. Such investigations would provide a more comprehensive understanding of the effectiveness of Gen Z digital language-integrated microlearning in promoting sustainable vocabulary development among EFL learners.

## CONCLUSION

This study investigated the effect of Gen Z digital language-integrated microlearning videos on Indonesian EFL learners' vocabulary retention using a quasi-experimental design. The findings showed that learners in the experimental group demonstrated significant improvement from the pre-test to the post-test and maintained relatively stable vocabulary performance on the seven-day delayed post-test, indicating effective short-term vocabulary retention. In contrast, the control group did not show statistically significant improvement across the testing occasions. Although significant differences were identified between the experimental and control groups in the post-test and delayed post-test, the significant baseline difference observed in the pre-test suggests that these findings should be interpreted with caution and cannot be attributed solely to the instructional treatment.

The findings indicate that integrating Gen Z digital language into microlearning videos has the potential to provide contextualized and engaging vocabulary learning experiences for Indonesian EFL learners. By combining concise instructional videos with familiar digital

communication features, such as abbreviations, emojis, contextual expressions, and visual illustrations, this instructional approach may support learners in processing and retaining newly learned vocabulary over a short period. Therefore, Gen Z digital language-integrated microlearning videos may serve as a complementary instructional resource that enriches conventional vocabulary instruction in EFL classrooms.

This study has several limitations. First, the sample consisted of only 30 Indonesian EFL learners from a single private vocational high school, which may limit the generalizability of the findings to other educational contexts. Second, the use of a non-equivalent control group design resulted in significant baseline differences between the experimental and control groups before the intervention. Third, vocabulary retention was measured only through a seven-day delayed post-test; therefore, the findings represent short-term vocabulary retention rather than long-term vocabulary retention. Future studies are encouraged to involve larger and more diverse participant groups, employ randomized experimental designs where feasible, and examine vocabulary retention over longer delayed intervals. Further research may also investigate the application of Gen Z digital language-integrated microlearning videos to other English language skills, such as reading, listening, speaking, and writing, and explore the contribution of individual digital language features to vocabulary learning and retention.

The findings suggest that Gen Z digital language-integrated microlearning videos have the potential to provide an engaging and contextually meaningful approach to vocabulary instruction for EFL learners. Teachers may use this instructional approach as a complementary resource to support vocabulary learning and short-term retention. Future research is encouraged to examine its long-term effectiveness using larger and more diverse samples, longer retention intervals, and randomized experimental designs. Further studies may also investigate its application to other English language skills and explore the contribution of individual digital language features to vocabulary learning and retention.

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