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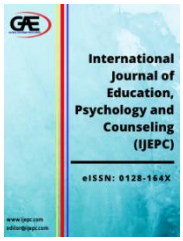

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EFFECTS OF MORPHOLOGICAL INSTRUCTION ON MORPHOLOGICAL AWARENESS, READING COMPREHENSION AND READING MOTIVATION AMONG LOWER SECONDARY LIMITED ENGLISH PROFICIENT LEARNERS: A PILOT STUDY

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Abstract:

Restricted vocabulary acquisition, limited exposure to English, and low English proficiency often lead to weak reading performance and declined motivation among ESL learners. While morphological instruction (MI) has exhibited positive effects in numerous ESL contexts, limited research has investigated its implementation among lower secondary learners in Malaysia. Moreover, the application of gamified approaches within MI is still restrained in the global research landscape. This pilot quasi-experimental study examined the effects of non-digital gamified (NG) and digital gamified (DG) MI on morphological awareness, reading comprehension, and reading motivation among 34 lower secondary limited English proficient (LEP) learners. Through gamified activities, learners received explicit instruction on inflectional and derivational morphemes over a three-week intervention. By adopting the Morphological Awareness Assessment Battery (MAAB), English Reading Comprehension Assessment (ERCA), and Motivation for Reading Questionnaire (MRQ), quantitative data from pre- and post-tests were analysed and discussed. Findings revealed stable outcomes in morphological awareness, reading comprehension, alongside positive trends in reading motivation across both groups. Pedagogical implications for classroom-based ESL instruction in both low-resource and technology-enhanced classroom settings are presented.

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ESL, Gamified Learning, Morphological Instruction, Reading Comprehension, Reading Motivation

Introduction

English reading proficiency is typically attributed closely to personal and academic development. It serves as a major gateway to global knowledge, offering learners access to the latest discoveries, ideas, and information across diverse fields. Ronzano (2010) argued that the capability to comprehend written materials like textbooks, scientific reports, and literacy works is a crucial determinant of academic achievement within the formal educational context. Since English is a compulsory language subject and the nation's second language (L2) in Malaysia, without a doubt, English proficiency is a vital prerequisite for mastering the curriculum and thriving across subject areas.

However, challenges in English reading comprehension are still experienced by many secondary school ESL learners, notably those with limited English proficiency (LEP). Consequently, this diminishes their motivation to engage with English texts, which are often perceived as too challenging or discouraging. A cycle of frustration and constrained progress is then formed from the coaction between comprehension failure and declining motivation. The struggle to decode and understand learning materials not only hinders immediate academic tasks but also impedes the long-term acquisition of English language skills (Al-Haydan, 2020). The results of PISA 2022 (OECD, 2023) highlighted this persistent obstacle. It exposed that reading, mathematics, and science were some areas that Malaysian 15-year-olds continue to lag behind. This underperformance is widespread among learners from disadvantaged backgrounds, who are often underserved by a one-size-fits-all curriculum that fails to accommodate diverse learning needs (The World Bank, 2024).

Morphological awareness is among the linguistic skills contributing to reading development that has constantly earned attention in literacy research. The ability to recognise, understand, and manipulate morphemes, which are the smallest units of meaning within a language is the common interpretation for morphological awareness. Word recognition, vocabulary acquisition, and text comprehension are among those widely affected by it (Carlisle, 2010). Additionally, in order to intensify learners' engagement in language learning, the usage of gamification through non-digital (NG) and digital (DG) approaches has been explored. The aim is to increase learners' motivation through the incorporation of elements such as challenges, rewards, and interactive tasks by drawing on Self-Determination Theory (SDT).

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This study contributes to ESL education by addressing several gaps in the growing body of research on MI within the Malaysian context. The current research examines the effects of MI on morphological awareness, reading comprehension, and reading motivation among lower secondary LEP learners, a group that remains rather underexplored. The preceding local studies have mainly focused on primary-level learners (e.g., Yap et al., 2020) or mixed-ability upper secondary learners (e.g., Varatharajoo et al., 2015a; Varatharajoo et al., 2015b). Besides, there are still a limited number of studies investigating the incorporation of gamification within MI (i.e., Qiao et al., 2023a; Qiao et al., 2023b). Comparative studies focusing on both NG and DG approaches have been recommended (Qiao et al., 2023a). A preliminary version of this study was previously presented in conference proceedings (Kang & Ngui, 2025), and the current article extends the work by providing a more detailed analysis and discussion of the findings.

Literature Review

The positive effects of MI on various aspects of ESL/EFL learners' language development, including morphological awareness, reading comprehension, and motivation have been verified by past studies. Firstly, Amirjalili and Jabbari (2018) proved that the improvement of reading comprehension among Iranian university students was attributed to MI. The findings revealed that the intervention enhanced reading comprehension (supra-lexical level) among higher-level learners and induced greater improvements in aspects of derivational morphology (sub-lexical level) among lower-level learners. Building on this, Ghasemi and Vaez-Dalili (2019) compared three instructional methods (Textual Enhancement, Metalinguistic Explanation, and Morpheme Recognition Task) for teaching fewer common affixes to Iranian university learners. They found that the explicit Metalinguistic Explanation was more effective than the implicit approaches. These findings from EFL settings are further supported by research in ESL contexts. Yap et al. (2020) investigated the effects of explicit MI on reading comprehension among Malaysian primary school students. They reported the experimental group outperformed the control group with remarkable improvements in reading comprehension. Overall, these findings indicate that explicit MI plays an important role in supporting reading comprehension across different learning contexts.

While the previously discussed studies (Amirjalili & Jabbari, 2018; Ghasemi & Vaez-Dalili, 2019; Yap et al., 2020) focused on the effects of explicit teaching techniques and content of MI, the following studies significantly advance the field by seriously considering learners' learning experiences. Qiao et al. (2023a) extended the body of research by investigating the effects of a non-digital gamified collaborative learning course on students' morphological analysis skills, reading comprehension, and intrinsic motivation. The gamified group significantly outperformed the non-gamified group on reading comprehension, though no significant difference observed on morphological analysis. Regarding motivation, gamification led to significantly higher perceived intrinsic motivation in autonomy and relatedness, but not in competence. In a further investigation of gamified approaches, Qiao et al. (2023b) employed a mixed-methods design to assess the effectiveness of digital gamified morphological exercises with minimal teacher instruction. The results revealed a significant advantage for the blended gamified condition over the face-to-face non-gamified condition on reading comprehension. In addition, students in the gamified group reported significantly higher levels of behavioural and cognitive engagement, although emotional engagement did not differ significantly between groups. These studies suggest that gamified MI may provide an engaging learning environment that supports both learners' motivation and their reading development. However, ESL research integrating gamification within MI remains underexplored.

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Furthermore, Yeung et al. (2025) conducted a randomised controlled trial with 156 Chinese Grade-8 EFL students comparing three interventions: morphological analysis, morphological decoding, and affix knowledge instruction. While all three groups showed significant improvements in affix knowledge, morphological awareness, word reading, and reading comprehension, no significant between-group differences were traced. At the same time, mixed findings have also been reported. Cabrera (2025) examined the relationship between morphological awareness and reading comprehension among senior high school ESL learners in the Philippines and no statistically significant relationship was found. Albeit contradicting the broader literature, this insignificant finding serves as an important indication that syntax, fluency, and background knowledge are the factors that can moderate the input of morphological awareness in certain contexts. Apparently, what works in one context may not translate into another. Therefore, further research is needed to examine how different instructional approaches to morphological instruction influence reading outcomes among specific learner groups.

Conceptual Framework

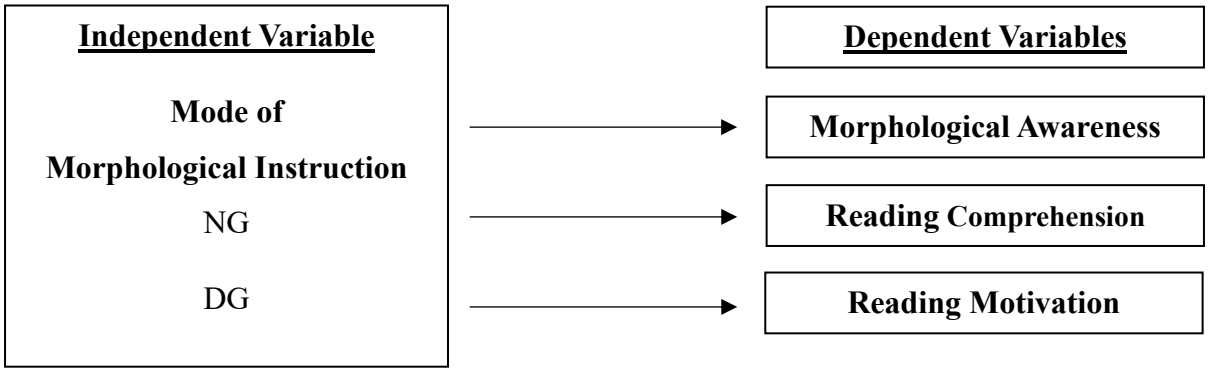

Figure 1: Conceptual Framework

Figure 1 illustrates the conceptual framework of the pilot study. The independent variable, mode of MI (the NG and DG groups), was hypothesised to positively influence three dependent variables: morphological awareness, reading comprehension, and reading motivation.

Research Questions

1. What are the effects of non-digital gamified (NG) and digital gamified (DG) MI on LEP learners' morphological awareness?
2. What are the effects of non-digital gamified (NG) and digital gamified (DG) MI on LEP learners' reading comprehension?
3. What are the effects of non-digital gamified (NG) and digital gamified (DG) MI on LEP learners' reading motivation?

Method

Research Design

The study employed a quasi-experimental pre-test-post-test design to examine the effects of non-digital gamified (NG) and digital gamified (DG) MI on lower secondary ESL learners' morphological awareness, reading comprehension, and reading motivation. This approach

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which was described as a "compromise design", endorses the practical impediment of conducting educational research, where irregular selection or distribution of classrooms is often impractical (Cohen et al., 2018). The research was conducted within an authentic educational setting. It is a private school where students have pre-assigned classes, classroom timetables, and well-established learning structures. Randomising the timing and target groups for interventions would be highly disruptive in this setting. Furthermore, proficiency level and grade are among the circumstances that determine student placement in the context of Malaysian schools. Consequently, reassigning students randomly into two experimental groups exposes noticeable logistical challenges. It remains as a relevant research design for evaluating the effects of an intervention programme despite its limitation (Campbell & Stanley, 2015, as cited in Yap et al., 2020). It allows comparisons between groups experiencing varying instructional interventions and expedites the assessment of transition over time (Cohen et al., 2018).

Research Participants

To single out the participants who were the most applicable to the objectives of the study, a purposive sampling technique was used. Thirty-four lower secondary LEP learners (aged 12 – 13) in a Malaysian private school participated in this pilot study. Participation was voluntary and parental consent was obtained before data collection. Participants were 34 lower secondary learners (aged 12–13) from a private school in Malaysia. They were identified as having limited English proficiency (LEP) based on two criteria: (a) school records indicating below-average performance in English language assessments, and (b) diagnostic placement test scores below the 40th percentile relative to grade-level expectations (CEFR A1 level). Two intact classes (Class 6 and Class 7) were randomly assigned to NG (n = 17) and DG (n = 17) groups. No control group was included, as the aim of this pilot study was to compare two active intervention approaches rather than to establish efficacy against a non-intervention baseline.
Research Instruments

Three instruments were administered as pre- and post-tests:

1. The Morphological Awareness Assessment Battery (MAAB) adapted from Coggins' (2016) research – It evaluated various aspects of morphological awareness like morphological structure, morphemic segmentation, and morphological manipulation (RQ 1). It demonstrated excellent internal consistency (Cronbach's $\alpha = .946$)
2. The English Reading Comprehension Assessment (ERCA) – It measured participants' literal and inferential comprehension (RQ 2). It demonstrated acceptable internal consistency (Cronbach's $\alpha = .823$).
3. The Motivation for Reading Questionnaire (MRQ) adapted from Wigfield and Guthrie's (1997) research – It measured both intrinsic and extrinsic aspects of reading motivation (RQ 3). It demonstrated excellent internal consistency (intrinsic motivation: $\alpha = .944$; extrinsic motivation: $\alpha = .897$).

Research Procedures

The intervention was conducted over three weeks as part of a five-week pilot study. Explicit MI was delivered to both groups of participants during their weekly reading lessons. All interventions were facilitated by the researcher. Each group's intervention was scheduled on a different day of the same week.

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In the initial week, the intervention was introduced, and the rules and regulations were also explained by the researcher. Next, pre-tests (the MAAB, ERCA, and MRQ) were administered to all participants to establish baseline measurements. To prevent participant fatigue, the three assessments were scheduled on distinct days within the week.

From Week 2 to Week 4, the weekly 60-minute intervention sessions commenced. In every session, different types of morphemes were taught to the participants according to a pre-determined plan by the researcher. To ensure a systematic and scaffolded learning experience for all participants, both interventions were designed using Bauer and Nation's (1993) first four levels of morphological complexity (as cited in Nation & Bauer, 2024).

The interventions were delivered in different settings: the NG group received its intervention in their regular classroom, while the DG group was taught in the computer lab. Both groups received identical morphological instruction; however, the mode of gamification differed between the two groups. Learning activities in the NG group were gamified but conducted without digital tools, whereas the DG group engaged in gamified activities that incorporated technology. Post-tests were conducted in Week 5 using the same instruments as the pre-tests. Due to time constraints, they were administered on the same day. To minimise potential practice and familiarity effects, the order of items was rearranged.

Data Analysis

Data were analysed using Statistical Product and Service Solutions (SPSS). Across the non-digital (NG) and digital (DG) group, descriptive statistics (means and standard deviations) were computed for all pre-test and post-test scores. To examine changes over time and differences between groups, repeated measures ANOVA was conducted for morphological awareness and reading comprehension. Next, multivariate analysis of variance (MANOVA) was performed to evaluate differences in intrinsic and extrinsic motivation across the two instructional conditions for reading motivation. Follow-up analyses were conducted where applicable to interpret significant effects. Statistical significance was set at $p < .05$, and effect sizes were calculated to determine the magnitude of observed differences. A post-hoc power analysis using G*Power indicated that with $N = 34$ and $\alpha = .05$, the study had sufficient power ($1-\beta = .80$) to detect large effects ($d = 0.80$) but was underpowered for small to medium effects ($d = 0.20–0.50$). This limitation is acknowledged in the interpretation of non-significant findings.

Results

Research Question 1: What Are the Effects of Non-Digital Gamified (NG) And Digital Gamified (DG) MI On LEP Learners' Morphological Awareness?

Table 1: Means, Standard Deviations, and Gain Scores for Morphological Awareness

Group	n	Pre-Test *M (SD)*	Post-Test *M (SD)*	Gain Score *M (SD)*
NG	17	53.35 (16.58)	54.18 (14.92)	0.83 (6.14)
DG	17	62.35 (17.82)	61.88 (19.53)	-0.47 (6.35)

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Table 1 shows the means, standard deviations, and gain scores for morphological awareness in NG and DG groups. The NG group's scores increased from pre-test (M = 53.35, SD = 16.58) to post-test (M = 54.18, SD = 14.92). This resulted in a modest mean gain of 0.83 (SD = 6.14). On the other hand, the DG group's scores decreased from pre-test (M = 62.35, SD = 17.82) to post-test (M = 61.88, SD = 19.53). This yielded a mean gain of -0.47 (SD = 6.35). These descriptive statistics indicate a minimal change from pre-test to post-test in both groups.

Table 2: Comparison of NG and DG Groups on Morphological Awareness: Post-Test and Gain Score

Comparison	*t*	df	*p*	Mean Difference	95% CI	Cohen's d
Post-Test: NG vs. DG	-1.29	32	.205	-7.71	[-19.85, 4.44]	-0.44
Gain Score: NG vs. DG	0.60	32	.550	1.29	[-3.07, 5.66]	0.21

Note. CI = Confidence Interval.

Prior to conducting inferential analyses, Levene's test was conducted to assess the homogeneity of variance assumption. For post-test scores, Levene's test was non-significant, F = 1.61, p = .213. Similarly, for gain scores, Levene's test was non-significant, F = 0.25, p = .618, indicating that the equal variances assumption was met.

Table 2 displays the independent-samples t-test comparisons between the NG and DG groups for morphological awareness at post-test and for gain scores. It illustrated no statistically significant difference between the NG and DG groups on post-test morphological awareness scores, t(32) = -1.29, p = .205, 95% CI [-19.85, 4.44]. Although the DG group's scores were moderately higher (d = -0.44), this difference did not reach statistical significance. Similarly, analysis of gain scores revealed no significant difference between the NG and groups, t(32) = 0.60, p = .550, 95% CI [-3.07, 5.66], with a small effect size (d = 0.21).

Research Question 2: What Are the Effects of Non-Digital Gamified (NG) And Digital Gamified (DG) MI On LEP Learners' Reading Comprehension?

Table 3: Means, Standard Deviations, and Gain Scores for Reading Comprehension

Group	n	Pre-Test *M (SD)*	Post-Test *M (SD)*	Gain Score *M (SD)*
NG	17	25.65 (3.10)	25.12 (3.90)	-0.53 (3.78)
DG	17	26.76 (4.27)	25.82 (4.97)	-0.94 (3.07)

Table 3 presents the means, standard deviations, and gain scores for reading comprehension in NG and DG groups. The NG group's scores decreased slightly from pre-test (M = 25.65, SD = 3.10) to post-test (M = 25.12, SD = 3.90). This resulted a mean gain of -0.53 (SD = 3.78). Likewise, the DG group's scores decreased from pre-test (M = 26.76, SD = 4.27) to post-test (M = 25.82, SD = 4.97). This generated a mean gain of -0.94 (SD = 3.07). These descriptive statistics showed an insignificant change from pre-test to post-test in both groups.

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Table 4: Comparison of NG and DG Groups on Reading Comprehension: Post-Test and Gain Score

Comparison	T	df	p	Mean Difference	95% CI	Cohen's d
Post-Test: NG vs. DG	-0.46	32	.648	-0.71	[-3.83, 2.41]	-0.16
Gain Score: NG vs. DG	0.35	32	.730	0.41	[-1.99, 2.82]	0.12

Note. CI = Confidence Interval.

For post-test scores, Levene's test was non-significant, $F = 1.93$, $p = .174$. Similarly, for gain scores, Levene's test was non-significant, $F = 0.35$, $p = .561$, confirming homogeneity of variance.

Table 4 illustrates the independent-samples t-test comparisons between the NG and DG groups for reading comprehension at post-test and for gain scores. It revealed no statistically significant difference between the NG and DG groups on post-test reading comprehension scores, $t(32) = -0.46$, $p = .648$, 95% CI [-3.83, 2.41]. The effect size was small ($d = -0.16$), showing that the two groups performed similarly at post-test. The second analysis revealed no significant difference between the NG and DG groups on reading comprehension gains, $t(32) = 0.35$, $p = .730$, 95% CI [-1.99, 2.82], with a negligible effect size ($d = 0.12$).

Research Question 3: What Are the Effects of Non-Digital Gamified (NG) And Digital Gamified (DG) MI On LEP Learners' Reading Motivation?

Table 5: Means, Standard Deviations, and Gain Scores for Intrinsic and Extrinsic Motivation

Group	n	Intrinsic Pre *M (SD)*	Intrinsic Post *M (SD)*	Intrinsic Gain *M (SD)*	Extrinsic Pre *M (SD)*	Extrinsic Post *M (SD)*	Extrinsic Gain *M (SD)*
NG	17	45.76 (18.92)	48.35 (15.56)	2.59 (8.23)	62.18 (20.99)	64.29 (21.58)	2.12 (12.66)
DG	17	56.35 (18.67)	54.71 (17.57)	-1.65 (10.34)	62.76 (12.73)	66.47 (20.31)	3.71 (12.13)

Based on reliability analysis, two subscales were computed: intrinsic motivation (19 items, $\alpha = .944$) and extrinsic motivation (24 items, excluding Items 25 and 44; $\alpha = .897$). Table 5 displays the means and standard deviations for intrinsic and extrinsic motivation as well as the respective gains in the NG and DG groups. For intrinsic motivation, the NG group increased from pre-test ($M = 45.76$, $SD = 18.92$) to post-test ($M = 48.35$, $SD = 15.56$), yielding a mean gain of 2.59 points ($SD = 8.23$). In contrast, the DG group decreased from pre-test ($M = 56.35$, $SD = 18.67$) to post-test ($M = 54.71$, $SD = 17.57$, resulting in a mean decline of -1.65 points ($SD = 10.34$). For extrinsic motivation, both groups demonstrated gains: the NG group increased from pre-test ($M = 62.18$, $SD = 20.99$) to post-test ($M = 64.29$, $SD = 21.58$), contributing a gain of 2.12 points ($SD = 12.66$). Meanwhile, the DG group increased from pre-test ($M = 62.76$, $SD = 12.73$) to post-test ($M = 66.47$, $SD = 20.31$), leading a gain of 3.71 points ($SD = 12.13$).

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Table 6: Comparison of NG and DG Groups on Intrinsic and Extrinsic Motivation: Post-Test and Gain Score

Comparison	T	df	p	Mean Difference	95% CI	Cohen's d
Post-Test: NG vs. DG						
Intrinsic Motivation	-1.12	32	.273	-6.35	[-17.95, 5.24]	-0.38
Extrinsic Motivation	-0.30	32	.764	-2.18	[-16.81, 12.46]	-0.10
Gain Score: NG vs. DG						
Intrinsic Motivation	1.32	32	.196	4.24	[-2.30, 10.77]	0.45
Extrinsic Motivation	-0.37	32	.711	-1.59	[-10.25, 7.08]	-0.13

Note. CI = Confidence Interval.

Levene's test confirmed that the assumption of homogeneity of variance was met for both intrinsic motivation scores, $F = 0.07$, $p = .791$, and extrinsic motivation scores, $F = 0.04$, $p = .851$. As shown in Table 6, the analyses revealed no statistically significant differences between groups on intrinsic motivation, $t(32) = -1.12$, $p = .273$, 95% CI [-17.95, 5.24], d = -0.38. Although the DG group scored higher at post-test, this difference was not statistically significant, and the effect size was small to medium. Similarly, no significant difference was found for extrinsic motivation, $t(32) = -0.30$, $p = .764$, 95% CI [-16.81, 12.46], $d = -0.10$.

Next, the analyses showed no statistically significant differences between groups on intrinsic motivation gain scores, $t(32) = 1.32$, $p = .196$, 95% CI [-2.30, 10.77], $d = 0.45$. The NG group revealed a positive gain while the DG group showed a slight decline, resulting in a medium effect size favouring NG, though this difference did not reach statistical significance. For extrinsic motivation gain scores, no significant difference was found, $t(32) = -0.37$, $p = .711$, 95% CI [-10.25, 7.08], $d = -0.13$, with both groups showing small positive gains and a negligible effect size.

Discussion

The quasi-experimental pilot study investigated the effects of MI, delivered through NG and DG modes, on lower secondary LEP learners' morphological awareness, reading comprehension, and reading motivation. It ascertained whether each approach produced significant gains and whether one method outperformed the other. The findings on the whole revealed a consistent pattern with no statistically significant improvements from pre-test to post-test within groups, and no significant differences between groups on either post-test scores or gain scores across the three dependent variables. Nevertheless, several meaningful patterns from the descriptive statistics and effect sizes were observed to offer some practical insights.

Morphological Awareness

In terms of morphological awareness, the NG group demonstrated a slight increase in scores, whereas the DG group showed a negligible decrease. The results revealed minimal changes in both groups from pre-test to post-test, with no statistically significant difference between the

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NG and DG groups. This suggests that none of the gamified approaches produced considerable improvements in learners' morphological awareness within the short intervention period.

These present results contradict with past studies that reported significant gains from MI (Amirjalili & Jabbari, 2018; Ghasemi & Vaez-Dalili, 2019; Yeung et al., 2025). On the other hand, they align with Qiao et al.'s (2025) recent evidence showing that improvements in morphological awareness may require a longer teaching and learning period and more intensive practice before measurable gains can be detected.

There are three factors that may explain this scenario. First and foremost, the participants in this study were LEP learners, whereas the other existing research has focused on learners with various proficiency levels. The LEP learners may still be acquiring basic vocabulary and grammatical knowledge. Thus, their ability to benefit from morphological analysis strategies within restricted number of sessions of MI may have been limited.

Secondly, the gamification features, both NG and DG, may have directed learners' attention toward game mechanics rather than the morphological content itself. Qiao et al. (2023a, 2023b) demonstrated that gamification can enhance reading comprehension and engagement. The difference was their participants were drawn from regular EFL classrooms rather than specifically LEP populations. For LEP learners, simultaneously processing morphological content and engaging with game elements may result in excessive cognitive load and minimal learning gains.

Lastly, the DG group performed better in the pre-test (MAAB) (M = 62.35) than the NG group (M = 53.35). Although it was not statistically significant, the baseline difference may have created a ceiling effect for the DG group. It might limit their potential for measurable gains. On the other way round, the NG group's lower starting point may have required more extensive instruction before improvement became detectable. So, future research should employ ANCOVA to control for such pre-test differences

.

Reading Comprehension

Similarly, the results pointed out that neither NG nor DG MI produced significant improvements in learners' reading comprehension. Both experimental groups experienced slight decreases in mean scores from pre-test to post-test, and the differences between groups were statistically insignificant with small effect sizes. These results suggest that the intervention had no immediate impact on their reading comprehension.

This finding differs from several previous studies (Amirjalili & Jabbari, 2018; Qiao et al., 2023a, 2023b; Yap et al., 2020; Yeung et al., 2025) that reported positive effects of morphological instruction on reading comprehension. However, the present results suggest that the relationship between morphological awareness and reading comprehension may not always be direct, which align with Cabrera's (2025) study.

Reading comprehension is a complex skill that is dependent on multiple linguistic and cognitive components, including vocabulary, syntactic knowledge, and background knowledge (Zhang et al., 2025). MI alone, especially over a short period, may be inadequate to produce measurable gains in comprehension if other foundational skills remain underdeveloped. This interpretation aligns with Zhang et al.'s (2025) meta-analytic finding that morphological

awareness affects reading comprehension indirectly through word reading and vocabulary. For LEP learners, these mediating skills require targeted support before the benefits of MI can bring any noticeable positive outcomes in their reading comprehension. In addition, the reading tasks used in the assessment may not have sufficiently required learners to apply morphological analysis strategies which limit the observable impact of the intervention.

Pienemann's (1998) Teachability Hypothesis offers one theoretical explanation: learners can only acquire linguistic features that are at their current developmental stage. For LEP learners with very limited vocabulary and syntactic knowledge, morphological awareness may be a later skill that cannot be effectively taught until they master foundational skills. This, this does not mean MI is ineffective for this population. It may require a longer preparatory phase focused on basic word recognition and vocabulary before morphological analysis strategies can be successfully applied during reading.

Reading Motivation

The findings regarding reading motivation also revealed no statistically significant differences between the NG and DG groups in terms of intrinsic or extrinsic motivation. Nonetheless, the descriptive statistics suggest some interesting trends. The NG group demonstrated a small increase in intrinsic motivation, whereas the DG group showed a slight decline. In contrast, both groups exhibited modest gains in extrinsic motivation.

These patterns may reflect differences in how learners experience NG and DG activities. It is possible that the face-to-face, collaborative elements of the NG group encouraged greater social connection and relatedness, which are the factors known to support intrinsic motivation (Qiao et al., 2023a). In contrast, for the DG group, the experience was likely quite different. Despite incorporating progression elements such as leaderboards and points, they may have felt more individualised and less socially engaging for LEP learners. Qiao et al. (2023a) found that gamification enhanced perceived autonomy and relatedness but not competence. The present study's pattern, while non-significant, hints that NG mode may better support these motivational dimensions for LEP learners.

The lack of significant motivational gains may reflect the challenges that LEP learners face when engaging with linguistically demanding content. Even with gamification, the cognitive effort needed to process morphological information may have restrained learners' capacity to experience the autonomy, competence, and relatedness that drive intrinsic motivation (Ryan & Deci, 2000). This interpretation is consistent with Qiao et al.'s (2023b) finding that gamification enhanced behavioural and cognitive engagement but not emotional engagement. Therefore, it suggests that learners may comply with tasks and offer cognitive effort without necessarily experiencing positive affect.

Limitations

There are several limitations to be acknowledged. Firstly, there was a lack of true control group. This means that we cannot determine whether the insignificant results are due to intervention ineffectiveness or broader factors such as test difficulty, learner fatigue, or normal variation over time. Secondly, the random assignment of classes into experimental groups did not fully equate the group. Pre-test differences favoured the DG group on morphological awareness and intrinsic motivation. Therefore, ANCOVA would have been preferable to t-tests for controlling

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these baseline differences. Lastly, the three-week intervention duration was shorter than many MI studies reporting positive effects (e.g., 10 weeks in Yeung et al., 2025. It may have been insufficient for LEP learners to internalise morphological knowledge.

Implications for Practice and Research

Despite the absence of statistically significant findings, the study offers practical suggestions for ESL educators. From a pedagogical perspective, the findings highlight the potential of gamified MI to foster learners' interest and motivation in reading-related tasks. The incorporation of gamified MI requires effective implementation rather than expecting it as an automatic "quick fix". For example, consistent explicit teaching of morphological rules, adequate practice opportunities and duration, and immediate feedback to support individual learner differences are required. Next, the small difference in scores also highlights the need for differentiated instruction. Collecting own data or conducting ongoing formative evaluation is recommended to evaluate which gamified MI works in students from a particular context. Moreover, the absence of reading comprehension gains despite MI reinforces the importance of addressing multiple component skills simultaneously. For LEP learners, MI should be integrated with vocabulary development, fluency practice, and strategy instruction to support the complex skill of reading comprehension.

In addition, the findings also provide some directions for future studies. First, replicating future research with a larger sample size is necessary to detect the small to medium effects that are realistic for authentic ESL classrooms. Second, longitudinal studies tracking morphological awareness and reading comprehension over extended periods (e.g., a full academic semester or year) should be considered. A delayed post-test is recommended to see if the MI effects are temporary or long-lasting. Thirdly, a qualitative approach, utilising semi-structured interviews or open-ended questions, would be helpful for exploring learners' subjective experiences with gamification and its impact on their reading motivation. Lastly, investigations on potential moderators like learners' mother tongue, frequency of English reading, and prior gaming experience are interesting to identify for whom gamified MI is most effective.

Conclusion

This study contributes to the existing literature on English language instruction in Malaysia by offering preliminary classroom-based evidence on the implementation of gamified MI among lower secondary LEP learners. Although the intervention did not produce statistically significant short-term gains in morphological awareness and reading comprehension, the findings suggest that gamified MI may shape learners' motivational aspects in different ways. This study also provides methodological insights by acknowledging the practical challenges of implementing gamified instruction in authentic Malaysian classrooms. While the preliminary results are not conclusive, they point to the need for further investigation using more meticulous experimental designs, larger sample sizes, and extended intervention periods. Future research should continue to explore how pedagogical design features interact with learner characteristics to support both literacy growth and motivation in Malaysian ESL contexts.

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