Blending traditional and digital methods: enhancing EFL speaking skills beyond LMS platforms

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Article Info	ABSTRACT
	The broad use of learning management system (LMS) in English as a foreign language (EFL) teaching indicates an increasingly urgent need for better methods to improve speaking skills. The research looks at the effectiveness of blended learning (BL) regarding fluency, pronunciation, and conversational improvement compared to the entire LMS approach within the learning process of EFL. It combines traditional face-to-face methods with digital tools to answer a significant need in language learning strategies. Therefore, the study compares the speaking proficiency of the two groups and investigates the impact of BL on motivation and engagement. The quasi-experimental design involved 100 intermediate EFL learners selected using purposive sampling from a Common European Framework of Reference for Languages (CEFR) A1–B2 English program. Following 12 weeks, the BL outperformed the LMS-only group in the post-test, showing development in fluency from 3.5 to 4.8 and pronunciation from 3.0 to 4.5. The LMS-only group revealed moderate gains but less pronounced: fluency increased from 3.4 to 4.0, and pronunciation from 3.1 to 3.8. Moreover, motivation and engagement increased in BL. This means combining traditional approaches with digital ones creates a more dynamic and robust environment for learning, which raises participation and proficiency in speaking. Further research is needed to optimize these strategies across various educational settings.

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1. INTRODUCTION

The introduction of digital tools has reshaped education. It has now shifted from a relatively simple approach to a more complex one that uses tools to help with language acquisition [1]. At the same time, learning management systems (LMS) are best at delivering learning materials, performing assessments, and monitoring engagement [1], [2]. Still, there are specific thoughts regarding the focus and usability of LMS, such as the excessive reliance on them due to their effectiveness in some areas, so speaking practice remains limited [2]. These roles do not call for a more interactive and free approach [3], [4].

Combining modern technology such as artificial intelligence (AI) language applications [5], virtual reality (VR) simulations [6], [7], and online speaking platforms [8] with real-life activities, including role plays, oral activities, and instant feedback [9], provides a novel solution to acquiring English as a foreign

language (EFL) speaking skills. Safe physical spaces can help achieve these goals regarding fluency and pronunciation, conversational skills, and motivation [10], [11]. Blended learning (BL) offers increased access, individualization, and effectiveness in language training [12]–[14]. Even in the context of deep language immersion or disguised interaction with video games, voice applications [15], [16], VR simulations [12], [17], and online speaking communities [18] boost learners' motivation, engagement, and contextual learning [19], [20].

Theoretical frameworks, such as the principle of zone of proximal development (ZPD) [21], [22], argue for combining traditional and digital practices to promote and foster social interaction, which is necessary during language learning. Cognitive load theory [23] argues for the efficiency of skill improvement through traditional and digital techniques. At the same time, the self-determination theory [24] maintains a forte of intrinsic motivation interventions based on autonomy, competence, and relatedness [25]. All these considerations provide substantial grounds for understanding BL influence on speaking proficiency, motivation, engagement, and confidence among EFL learners [25]–[27].

This research examines how effective BL is compared to LMS-only techniques in improving speaking proficiency among learners. More specifically, it assesses the impact of BL on learners' fluency, pronunciation, motivation, and engagement and sees and integrates traditional digital strategies for better oral communication skills [7], [17], [28]–[31]. In summary, the paper presents a novel method for improving speaking skills in EFL by using the most recent digital technologies, including AI-powered language applications and VR simulations, alongside traditional classroom instruction while going beyond the boundaries of standard LMS systems. Unlike prior studies that concentrated on vocabulary and grammar, this one focuses on fluency, pronunciation, and conversational skills, which, through implementing a BL model, proved to be highly enhanced. Also, its thorough approach integrating standardized examinations, digital logs of computer usage, and advanced statistical evaluation provides a new usable model that improves the concept and practice of EFL teaching and learning.

2. METHOD

The research design for the study is quasi-experimental to find out how BL compares to the pure approach of LMS. In this respect, the sample for the study comprised 100 intermediate EFL learners who had been split into two groups: an experimental group and a control group. Pre-test, post-test, and motivation and engagement surveys to assess speaking proficiency in skills such as fluency, pronunciation, and conversational skills were done to collect the data. The t-tests and analysis of variance (ANOVA) tests are statistical analyses applied to measure the significance of the performances of various groups.

2.1. Research design

The study is in a quasi-experimental research design and carried out to compare a BL technique with a combination of traditional techniques of face-to-face interaction and a digital tool against an LMS-only approach to EFL learners' speaking proficiency. The motivational, engagement, and confidence level changes among the EFL learners regarding changes in speaking proficiency were tested through pre-test and post-test activities. Two groups of EFL learners, one experimentally and the other as control groups given an LMS-only learning environment. It enabled an outcome comparison between the two groups and allowed insight into the effectiveness of the BL approach.

2.2. Population and sampling

These included EFL learners doing their undergraduate degrees and studying at levels A1–B2, according to the Common European Framework of Reference for Languages (CEFR), at a language institute. Participants in this specific program are usually adult learners between the ages of 18 and 35 with diverse linguistic and cultural backgrounds; they generally join with some prior exposure to English but seek to develop their speaking skills.

Purposive sampling techniques were used to choose the participants who have enrolled in CEFR A1–B2 level English courses and can access traditional classroom settings and digital tools. The sample had 100 participants, 50 in the experimental group, and 50 in the control group. This sample size is good enough to note the differences between the two groups.

The study acknowledges the limitation posed by the small sample size of 100 participants. As participants procure through purposive sampling, the scope of the findings is limited, which may not apply to a broader audience. Creswell [32] stated that a sample size of 30 to 100 is standard for quasi-experimental studies that seek to achieve medium to significant effects in an educational context. These findings must be verified with varying educational contexts to test for validity; therefore, future studies may consider using larger sample sizes with more diversity [32]. Despite this limitation, the sample size is

sufficient for the statistical techniques (t-tests and ANOVA), which proved the study hypothesis by revealing significant differences between the experimental and control groups.

2.3. Instruments

Data concerning EFL learners' speaking proficiency, motivation, engagement, and confidence was recorded thoroughly using carefully selected and varied instruments, including standardized speaking proficiency tests, questionnaires, surveys, and digital tool usage logs. The researchers also ran reliability and validity checks to ensure that the data they collected was highly accurate and that there were no errors.
a. Speaking proficiency tests: standardized speaking tests were administered at the beginning and end of the study to assess fluency, pronunciation, and conversational skills.
b. Motivation and engagement questionnaires: validated questionnaires, such as the motivated strategies for learning questionnaire (MSLQ), were used to measure learners' motivation and engagement levels.
c. Confidence surveys: self-assessment surveys were used to gauge learners' confidence in speaking abilities before and after the intervention.
d. Digital tool usage logs: data from digital tools (e.g., AI-driven language applications and VR simulations) were collected to monitor usage patterns and engagement.

2.4. Data collection strategy

Data collection was conducted over 12 weeks. The duration of 12 weeks was chosen to align with the standard academic term structure and provide sufficient time for participants to engage meaningfully with the BL intervention. This period was deemed adequate to observe measurable improvements in speaking proficiency while maintaining participant commitment and minimizing attrition. The process included:
a. Pre-test administration: both groups were assessed on their initial speaking proficiency, motivation, engagement, and confidence.
b. Implementation of interventions: the treatment group was taught by exposing them to different BL sessions and teaching combinations of traditional and digital tools, while the control group was taught using the LMS-only approach.
c. Continuous monitoring: data on the frequency and duration of usage and engagement data during the intervention period for interaction with digital tools and participation in other activities were collected.
d. Post-test administration: at the end of 12 weeks, a post-test was administered to measure the change in speaking proficiency, motivation, engagement, and confidence in a similar manner to the pre-test.
e. Data analysis: statistical analysis with t-tests and ANOVA was applied to compare the pre-test and post-test findings between groups and within groups. Qualitative data from surveys and logs were analyzed thematically for further insight into learner experiences and perceptions.

Table 1 outlines the systematic steps taken to ensure the reliability and validity of the instruments used in this study, thereby strengthening the credibility of the research findings.

The t-test is used to compare the means of two groups: the experimental group (BL) and the control group (LMS-only). The formula calculates the difference between the two group means relative to the variability in the data. A higher t-value indicates a more significant difference between the groups. Using this method, the study can determine whether the improvements in fluency, pronunciation, or conversational skills are statistically significant between the two groups. This test is particularly useful in a quasi-experimental design, where it compares two teaching methods. In (1), it was used to assess the significance of differences in fluency, pronunciation, and conversational skills between the groups.

$$t = \frac{X_1 - X_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \tag{1}$$

where,
X_1 and X_2 are the means of the experimental and control groups.
s_1^2 and s_2^2 are the variances of the two groups.
n_1 and n_2 are the sample sizes of the groups.

ANOVA is used to compare motivation levels across the experimental and control groups and across different time points (pre-test and post-test). This is critical in identifying the broader impact of BL compared to traditional LMS-based instruction. To compare more than two conditions (e.g., motivation, engagement, confidence across different learning conditions), an ANOVA can be employed as shown in (2).

$$F = \frac{Mean\ Square\ Between\ Groups}{Mean\ Square\ Within\ Groups} \tag{2}$$

Table 1. Steps taken for reliability and validity of the instruments

Instrument	Steps for reliability	Steps for validity	Results supporting validity and reliability
Speaking proficiency tests	− Utilized standardized speaking tests with established reliability metrics. − Conducted pilot testing to confirm the consistency of test results. − Applied inter-rater reliability by having multiple raters score speaking tests and calculating agreement.	− Ensured content validity by aligning tests with EFL curriculum and proficiency standards. − Used expert reviews to confirm the appropriateness and comprehensiveness of the test items.	The high inter-rater reliability of speaking tests demonstrated consistent scoring, enhancing the credibility of findings.
Motivation and engagement	− Administered validated questionnaires (e.g., MSLQ) with established reliability coefficients.	− Ensured construct validity by using widely recognized and theoretically grounded questionnaires.	Factor analysis supported the construct validity of the motivation and engagement questionnaires.
Questionnaires	− Conducted internal consistency checks using Cronbach's alpha. − Test-retest reliability was assessed by administering the questionnaire at two different points.	− Performed factor analysis to confirm the underlying structure of the questionnaires. − Adapted questionnaires to the EFL context through expert reviews and pilot testing.	Cronbach's alpha values for the questionnaires and surveys exceeded 0.7, confirming strong internal consistency.
Confidence surveys	− Utilized self-assessment surveys with questions adapted from validated instruments. − Conducted internal consistency checks using Cronbach's alpha. − Test-retest reliability was assessed by administering the survey at two different points in time.	− Ensured face validity through expert review to confirm that the surveys accurately measure confidence. − Used pilot testing to refine survey items for clarity and relevance. − Correlated confidence survey results with other related measures of speaking proficiency.	
Digital tool usage logs	− Automated data collection to ensure consistency and accuracy of log entries. − Conducted regular system checks to maintain the reliability of logging mechanisms.	− Validated log metrics by cross-referencing with observed learner behaviors and engagement levels. − Ensured content validity by confirming that log metrics accurately reflect engagement with digital tools.	The digital tool usage logs accurately reflected learner engagement, supported by thematic analysis of qualitative data.

Cohen's d measures the magnitude of the difference between two group means, offering an understanding of how meaningful the differences are, beyond statistical significance. A small effect size suggests a minimal practical difference between the groups, whereas a more significant effect size implies a more impactful difference. In this study, Cohen's d can be used to quantify how much better the experimental group performed in speaking proficiency compared to the control group. This helps communicate the practical importance of BL, providing insight into whether the changes are significant enough to have educational significance. To measure the magnitude of differences between the experimental and control groups, Cohen's d can be calculated using (3).

$$d = \frac{X_1 - X_3}{s_p} \tag{3}$$

where, s_p is the pooled standard deviation in (4).

$$s_p = \sqrt{\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1 + n_2 - 2}} \tag{4}$$

Cohen's d provides an estimate of the effect size, indicating how impactful the BL approach is compared to the LMS-only approach.

Linear regression is employed to predict speaking proficiency based on factors like motivation, engagement, and confidence. This method helps identify which factors most strongly influence improvements in speaking skills, thus optimizing the BL approach by focusing on the most impactful elements. It also provides a model that can be used for future studies to predict learner outcomes based on similar variables.

To predict speaking proficiency (dependent variable) based on independent variables like motivation, engagement, and confidence, a simple linear regression equation used as in (5).

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n + \epsilon \tag{5}$$

where,

Y represents the speaking proficiency score.

$X_1, X_2, \dots, X_n$ are the predictor variables (motivation and engagement).

β_0 is the intercept, and $\beta_1, \beta_2, \dots, \beta_n$ are the coefficients.

ϵ is the error term.

Methodologically, the research design was intended to enable comprehensive comparisons between BL and LMS-only instruction concerning the development of EFL learners' speaking proficiency. This study was particularly strong about standardized tests and valid questionnaires for data collection with usage logs from digital tools. Consequently, statistical tests were selected to check the significance of results; the reliability and validity of instruments were checked at length. This method will, therefore, consider in more detail exactly how the integration of traditional and digital practices influences the speaking skill results of the learners.

3. RESULTS AND DISCUSSION

A speaking proficiency test administered to the control group (LMS-only) and experimental group (BL) at the onset and after 12 weeks measured fluency, pronunciation, and conversational skills. An analysis was made for the effect of the BL approach on EFL learners' speaking proficiency. Table 2 shows the pre-test and post-test scores of participants.

a. Fluency: for the experimental group, we recorded a change in the range between 3.5 and 4.8 compared to the control group's gradual increase from 3.4 to 4.0.

b. Pronunciation: the experimental group's score increased from 3.0 to 4.5, while the control group slightly increased from 3.1 to 3.8.

c. Vocabulary, coherence, and relevance: the experimental group recorded the highest average increase of 1.2 points per category. In comparison, the LMS Only group achieved a maximum average change of 0.6 points in all the categories.

d. Overall scores: the total score for the experimental group gradually increased from 25.0 to 37.0, while within the control group, it changed from 25.1 to 30.8.

Table 2. Pre-test and post-test scores

Group	Pr	In	Fl	Vo	Co	Tt	Res	Re	Ts
Experimental (BL)	3.0/4.5	3.2/4.6	3.5/4.8	3.4/4.7	3.3/4.6	3.1/4.5	3.2/4.6	3.3/4.7	25.0/37.0
Control (LMS-only)	3.1/3.8	3.3/3.9	3.4/4.0	3.2/3.9	3.4/3.8	3.2/3.7	3.3/3.8	3.2/3.9	25.1/30.8

Note: Pr (pronunciation), In (intonation), Fl (fluency), Vo (vocabulary), Co (coherence), Tt (turn-taking), Res (responsiveness), Re (relevance), Ts (total score).

These results illustrate the benefits gained from expanding the boundaries of traditional learning and incorporating AI-enabled language applications and VR simulations into the process. These resources enable learners to have diverse, interactive, and unique ways of speaking practice. Figure 1 compares the pre-test and post-test speaking proficiency scores of the experimental group (BL) and the control group (LMS-only). The categories tested included pronunciation, intonation, fluency, vocabulary, coherence, turn-taking, responsiveness, and relevance.

The findings indicate that this study's BL approach was more effective in improving the EFL learners' speaking skills than the LMS-only method. In particular, the experimental group's improvement in fluency, which increased from 3.5 to 4.8, and pronunciation, which rose from 3.0 to 4.5, was much more significant than that of the LMS-only group. These results align with Graham and Halverson study [33], which, alongside other researchers, demonstrated that BL has a high value in fostering active engagement and improving language proficiency using different modes of resources. Additionally, the results support the research conducted by Žnideršič et al. [34], which explored the implementation of gamification with VR and its effect on learners' timing and fluency competencies.

The increase in the self-discipline and engagement levels of the participants from the experimental group highlights the advantages of BL. Following the intervention, goal orientation shifted toward intrinsic motivation (increasing from 3.4 to 4.0), and task value rose from 4.2 to 4.5. These outcomes are consistent with the findings of Wong et al. [35] who demonstrated that BL environments enhance self-motivation by promoting learner autonomy and increasing task relevance. These results are also substantiated by the self-determination theory [24], which argues that learners who are provided with digital aids in learning materials and activities through BL are enabled to satisfy their psychological needs for autonomy, competence, and relatedness, which motivates them to engage with the materials more [36].
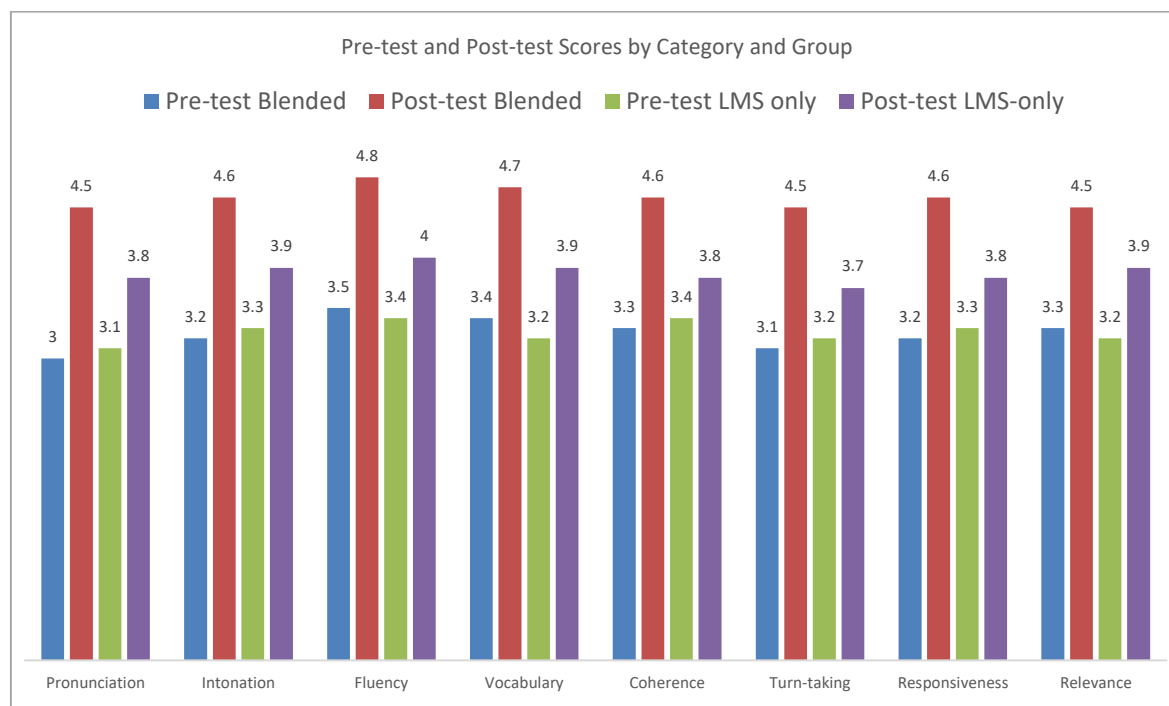
Figure 1. Comparison between the pre-test and post-test speaking proficiency scores

3.1. Motivation and engagement analysis

Table 3 summarizes the means for scores of motivation and engagement questionnaires administered pre- and post-intervention, with mean scores specified by each dimension of motivation and engagement. The experimental group continues to outperform the listed criteria, as seen in Table 3, alongside a growing trend in the motivation and engagement dimensions.

a. Intrinsic goal orientation: the scores increased from 3.4 to 4.0, suggesting that the blended approach enhanced the learners' internal motivation.

b. Task value and cognitive engagement: as with most categories, these also had the most growth (4.2 to 4.5 and 3.7 to 4.4, respectively), showing the importance and the intervention level that they were able to receive.

c. Test anxiety: witnessed a reduction from 3.9 to 3.5, which indicates that the frequent practice and feedback in the blended model played a part in helping the learners reduce their fear of assessments.

Table 3. Means for scores of motivations and engagement

Category	Pre-test average score	Post-test average score
Intrinsic goal orientation	3.4	4.0
Extrinsic goal orientation	3.8	4.2
Task value	4.2	4.5
Control of learning beliefs	3.6	4.1
Self-efficacy for learning and performance	3.5	4.3
Test anxiety	3.9	3.5
Behavioral engagement	3.3	4.0
Emotional engagement	3.1	3.8
Cognitive engagement	3.7	4.4
Social engagement	3.2	4.1

BL strategies helped create a low-stakes, personalized, interactive, and real-time environment where the students could use the feedback to enhance their speaking confidence and skills, aiding their motivation. These results help evaluate the effectiveness of the BL approach in enhancing learners' confidence in their English-speaking abilities. Figure 2 summarizes how the mean scores for pre-test and post-test confidence surveys are distributed across the 10 items.
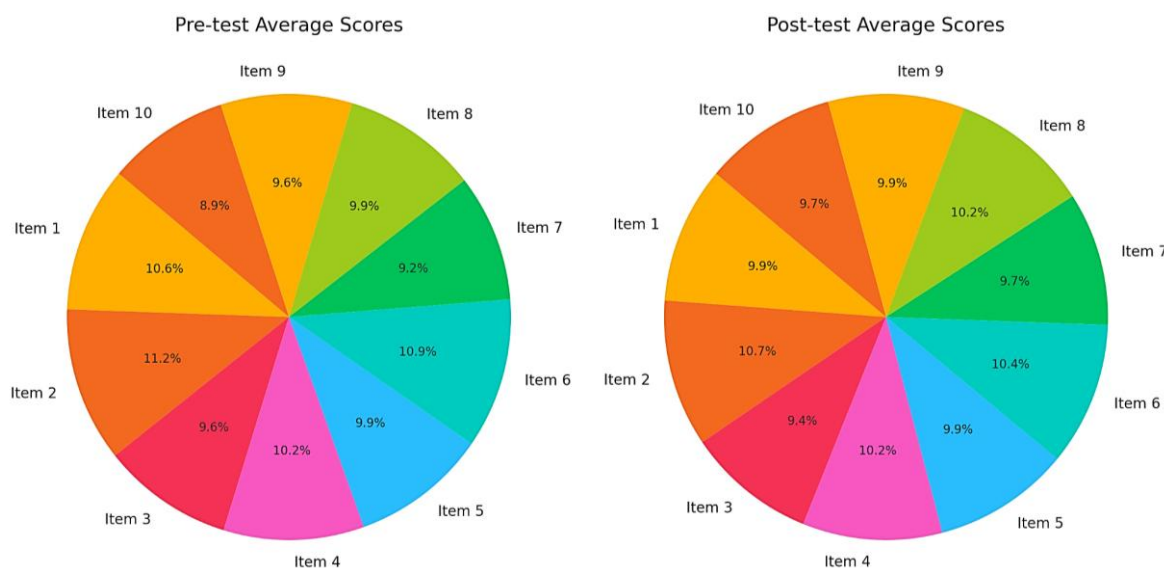
Figure 2. Mean scores for both the pre-test and post-test confidence surveys

The findings concerning self-discipline and engagement are consistent with cognitive load theory, which states that learning is more effective when irrelevant cognitive load is minimized [23]. Learners using AI-driven language learning applications and VR language learning simulations in BL settings could be immersed and receive feedback when needed. This likely reduced cognitive load, improving concentration during the language acquisition process. As Taguchi [17] argues, immersion in virtual environments is one of the most essential conditions for acquiring pragmatic competencies.

In addition, the experimental groups' reduction in test anxiety, from 3.9 to 3.5, coincides with Almansour and Alfahad [28] observation about the role of constant practice and feedback in reducing language anxiety. Such reduction is particularly crucial in oral instruction, where anxiety affects performance. Through BL, learners can practice their speaking skills in an interactive, low-stakes environment without fear of negative evaluation.

The increase in proficiency in speaking, mainly fluency and pronunciation, results from the engaging and active nature of BL. The considerable increase in fluency and pronunciation accuracy stemmed from the learner's immersion in authentic conversation through VR and their use of AI-powered language apps designed to provide individualized pronunciation drills. Such results confirm those found by Hsu [37], who noting the advantages of VR in language learning, reported its use for significantly improved speaking accuracy and fluency among students through real-life communication contexts.

From a theory perspective, Vygotsky's ZPD explains how students can be assisted in reaching their full potential. Through the "scaffold" provided by the BL environment, these students could engage in speaking activities that would have otherwise been impossible [38]. Face-to-face interaction and digital tools provided the learners within the ZPD with guided practice and responsible feedback that helped them advance within their zone [38].

3.2. Comparison with previous research

The results of this investigation are also consistent with research cited earlier regarding the effectiveness of BL [17], [18], [20], which is concerned with enhancing language acquisition through flexibility, situational relevance, and interactivity. Nevertheless, whereas study by Smirani and Yamani [29] investigated primarily vocabulary and grammar mastery, this research takes a step further by distinguishing the contribution made by BL with respect to developing English speaking skills; more specifically, regarding pronunciation and fluency.

AI-based applications and VR simulations took learners into real-life speaking experiences, going beyond what was possible with a traditional-only approach of LMS. This work, therefore, has practical implications as it informs teacher educators on how to approach the combination of digital tools with the conventional way of teaching to reduce speaking anxiety and enhance students' confidence. In theory, it deepens the understanding of BL's motivation and engagement suppression functions while presenting the area of its application using the ZPD [21], [22] and cognitive load theory [23] as a starting point. These methodological contributions contribute to the theory as they comprehensively evaluate BL's impact while

employing standardized speaking tests, detailed digital usage logs, and robust statistical analyses. Such contributions explain why BL can transform EFL teaching by offering a replicable, learner-based model that prepares EFL students for real-life communication scenarios.

The measly improvement from a fluency score of 3.4 to 4.0 in the LMS-only group highlights how inadequate traditional LMS platforms are in fostering speaking skills. Linuwih *et al.* [10] along with more recent studies [39], [40] explained how the primary function of LMS platforms is to provide content and conduct evaluations instead of promoting interactivity and discourse. The traditional LMS environment is inadequate for the context and dynamism that language learners, especially in speaking proficiency, need to reach [39], [41]. This study not only reinforced the findings noted by Lechintan-Siefer [8] but also added to them by demonstrating the BL community's effectiveness through role-playing-facilitated online speaking communities. These tasks are meant to foster learning, which language learners acquire through activities like these teachers so fondly call "experiential learning."

3.3. The use of digital artifacts in language learning instruction

The use of digital tool utilization, as seen in Figure 3, further validates the use of BL models for the following reasons: AI language applications have exhibited a moderate level of usability with an engagement score of 3.8. These applications are perceived as extensions of Test of English as a Foreign Language (TOEFL) preparation modules, designed primarily to improve a few overarching linguistic abilities like vocabulary and grammar. VR simulations rated highly engaging (4.5) combined with immersion in discussions enhance fluency and timing. When integrated into a blended setting, these tools offer students a variety of useful ways to learn skills, unlike the LMS-only methods, which are monotonous and lack interaction on the learner's side.
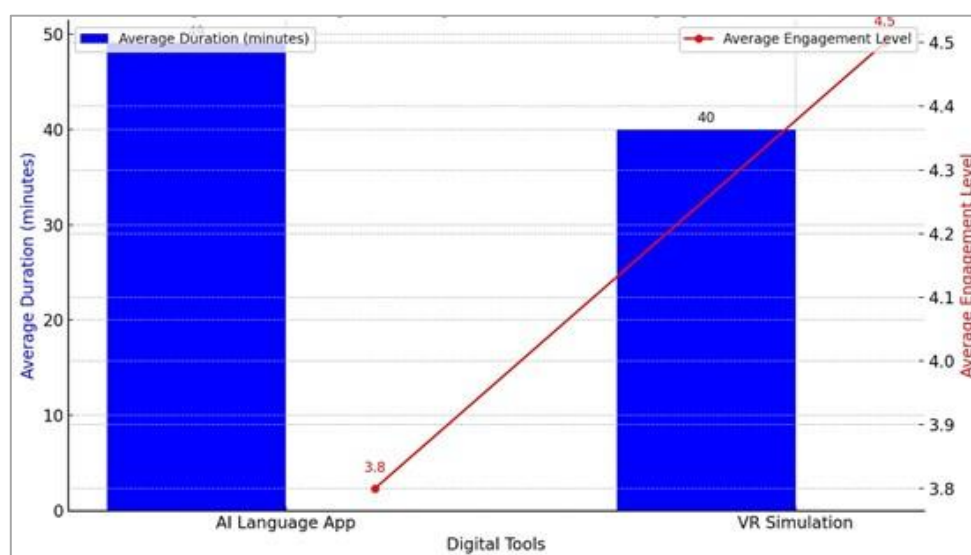

Figure 3. Digital tools usage: average duration and engagement level

3.4. Realistic implication and future research

The results indicate that speaking practice at a distance and using iPads have the potential to become more readily available. By combining them with BL and transcending geographical limitations, imagine a global world with practical and innovative means of education. Nonetheless, carrying out BL is expensive, owing to the required sophisticated hardware and the limitations faced by this study, such as the high cost of VR simulations and operating with a small sample. These aspects confirm the urgent need for further studies to assess its effectiveness and applicability for different learners, contexts, needs, and geographical areas. Furthermore, later research should also investigate how more profound AI and adaptive technologies can be embedded to provide tailored educational trajectories to learners.

According to research, BL approaches encompass both the online and offline spectrum, which is advantageous for EFL learners, especially regarding their speaking skills, motivation, and engagement levels [42]–[46]. By tackling widespread issues such as speaking anxiety, BL fills the void left by traditional means and focuses on only using LMS approaches [47]. This solution is comparatively better for gaining trustworthy oral communication skills, which are helpful in real-world situations [48].

The results of this research have significantly impacted the practitioners of EFL. First, they call for reflection on incorporating speaking skills using digital technologies. Teachers should incorporate AI-based applications and VR simulations that cater to the needs of the students and provide personalized listening and speaking opportunities. Second, this research emphasizes the necessity of training teachers to use BL strategies effectively. As Martin *et al.* [49] points out, professional training is important to fully unleash the teaching potential of digital instruments in teaching language.

This modern approach should be given much more consideration in future research, as it has yet to be studied in the EFL context. There is still a need to study the effectiveness of BL on foreign language acquisition and its relevance to the needs of different learners and educational institutions. It is crucial to fill these gaps so teachers and educational policy-makers can take adequate and practical steps for 21st-century learners.

4. CONCLUSION

The research evidences the strong impact that the combination of traditional face-to-face teaching with digital tools has on the speaking improvement of EFL learners. The investigation focused on fluency, pronunciation, and conversational skills. It compared a BL approach to an LMS-only method and found substantial differences in learner outcomes. The results varied clearly and precisely that the experimental group, which had to go through BL, outperformed the LMS-only control group in many interesting aspects such as fluency, increasing from 3.5 to 4.8, and pronunciation, increasing from 3.0 to 4.5, whereas the LMS group received less improvement in fluency from 3.4 to 4.0 and in pronunciation from 3.1 to 3.8. Key digital tools, in this respect, included AI-driven language applications and VR simulations. While AI applications provided personalized feedback and targeted exercises, VR created much more life-like, immersive speaking scenarios. These tools supported traditional instruction by offering a range of engaging learning activities that enhanced learners' motivation, engagement, and confidence. Follow-up surveys taken after intervention revealed intrinsic motivation increased from 3.4 to 4.0, extrinsic motivation from 3.8 to 4.2; self-efficacy for learning and performance increased from 3.5 to 4.3.

The results of this research lend themselves to a call for the increased utilization of BL within EFL curricula in the future. Digitized tools are to be integrated in a more optimized way with regard to different learner profiles and educational contexts, which would entail further research into that matter. Policymakers should make investments—both into infrastructure and teacher training—in order to be able to use technologies effectively. Although these findings are encouraging, the limitations of this study include small sample size and a relatively short duration of 12 weeks, which may raise questions about long-term generalizability and impact. Further studies will expand such aspects by considering larger samples, longer periods, and more objective measures for engagement and proficiency.

AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

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C : **C**onceptualization	I : **I**nvestigation	Vi : **Vi**sualization
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So : **So**ftware	D : **D**ata Curation	P : **P**roject administration
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CONFLICT OF INTEREST STATEMENT
Authors state no conflict of interest.

INFORMED CONSENT
We have obtained informed consent from all individuals included in this study.

DATA AVAILABILITY
The data that support the findings of this study are openly available in "A Comprehensive Review of Traditional and Digital Blending Methods for Enhancing EFL Speaking Skills Beyond LMS Platforms Dataset" at https://doi.org/10.6084/m9.figshare.28518377.

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