

The Impact of Mobile-assisted Language Learning on Productive Skills and Motivation Among Learners of English as a Foreign Language

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Abstract

Mobile-assisted Language Learning (MALL) has shown strong potential to improve language learning. In Gulf countries, most research has focused on vocabulary, grammar, learner perceptions and receptive skills. Still, there is less evidence about its impact on speaking and writing for English for Specific Purposes (ESP) learners. Building productive communication skills is especially important in technical higher education, where students need to communicate well in both academic and professional settings. This study examined how MALL-integrated instruction affects productive language development and explored the motivations of Saudi ESP learners to use MALL. The research involved 60 male students in an English Communication course at a Saudi technical college. Thirty students received MALL-integrated instruction, while the other thirty had traditional ESP instruction over eight weeks. Data came from speaking and writing assessments, a motivation questionnaire, learner journals and classroom observations. The results showed that students who used MALL made greater progress in speaking and writing. They also reported positive motivation toward MALL and higher intrinsic motivation was linked to better language performance. Qualitative results showed more engagement, greater confidence in speaking and writing, more independent learning and better use of feedback. While the study is limited by its single-institution setting, all-male sample and short duration, it suggests that well-designed MALL can help develop productive language skills in Saudi ESP contexts. Future studies should examine how Artificial Intelligence (AI)-supported mobile learning might further improve learner autonomy, self-regulation and communication skills.

Keywords: English for Specific Purposes, Learner Motivation, Mobile-assisted Language Learning, Speaking Skills, Writing Skills.

Introduction

English is the principal language of instruction, professional communication and global engagement (1); Saudi higher education, particularly in technical and engineering programmes, accordingly requires English for defined academic and occupational purposes (2). Many Saudi undergraduates nevertheless enter with limited productive English, especially in speaking and writing (3, 4) and even those at intermediate CEFR levels (B1-B2) often struggle to produce texts meeting academic and workplace expectations (5). At Yanbu Industrial College (YIC), where instruction is entirely in English and ESP courses are compulsory (6), students report persistent difficulty in technical discussions, laboratory and progress reports, presentations and industrial-training communication (7) — needs that are occupational as much as academic and that make productive skills a primary ESP objective in Saudi

technical colleges (7, 8). MALL has been advanced as one response: mobile devices let learners access resources anywhere, supporting personalised practice (9, 10), with instant feedback and progress tracking beyond timetabled classes (11, 12). Empirical work reports measurable gains and user experience (13); stronger speaking from project-based learning (14); improved motivation and self-efficacy (15); and vocabulary and agency gains from AI-supported tools (16, 17). Saudi studies report vocabulary growth through collaborative MALL (18), improved speaking (19) and improved paragraph writing through peer review (20), though reviews note that most research addresses vocabulary, attitudes, or receptive skills, uses short, single-group designs and finds effectiveness dependent on pedagogical integration rather than technology (21-23), with Saudi evidence still concentrated on vocabulary

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and attitudes and speaking and writing rarely measured directly (7, 18, 23).

Three gaps follow. First, productive skills remain under-examined relative to receptive skills, particularly through rated rather than self-reported performance. Second, motivation and language performance are seldom examined together, leaving unclear which motivational orientations relate to productive gains. Third, almost no study addresses intermediate ESP learners in technical higher education, whose communicative demands are discipline-specific and workplace-oriented. The present study addresses these gaps in a Saudi technical college setting.

The study aimed to examine the relationship between MALL-integrated instruction and productive language development among Saudi ESP learners and to describe their motivational orientations. The objectives were to:

- (a) compare speaking and writing gains between MALL-integrated and conventional instruction over eight weeks;
- (b) determine learners' intrinsic and extrinsic motivation postintervention;
- (c) examine associations between motivation and productive performance; and
- (d) describe how learners perceived MALL as a support for productive development.

The research questions were:

RQ1: To what extent is MALL integration associated with differences in learners' productive skills (speaking and writing) relative to conventional instruction?

RQ2: What levels of intrinsic and extrinsic motivation do learners report toward MALL following the intervention?

RQ3: How do learners perceive MALL as a support for their productive language development?

The novelty of the study lies in three features: it measures rated speaking and writing performance, rather than perceptions or receptive outcomes among intermediate ESP learners in a Saudi technical college, a combination earlier MALL research has largely bypassed; it combines a comparison-group design with motivation data, reflective journals and classroom observation so that gains, motivations and learner experience can be interpreted together; and it distinguishes intrinsic from extrinsic motivation in relation to performance, yielding evidence about the

conditions under which mobile tools support production rather than about availability alone.

Defining Mobile-assisted Language Learning

In this study, MALL is defined as language learning mediated by personal, handheld, internet-enabled devices, exploiting the portability, availability and personalisation these afford to extend practice beyond class (9, 10), distinguished here from four adjacent terms. Technology-Enhanced Language Learning (TELL) is the broadest term, covering any digital technology in language education, of which MALL is a device-and-mobility-defined subset. Computer-Assisted Language Learning (CALL) denotes learning mediated by desktop or laptop computers in a fixed location, whereas MALL differs in the brevity and situational embedding of practice. Mobile learning (m-learning) covers mobile-device learning in any discipline; MALL is its language-specific application, shaped by input, output, interaction and feedback. Blended learning combines face-to-face and online components in a planned ratio; MALL becomes part of such a design when integrated with classroom instruction, as here, though it may also occur informally. Here, MALL denotes smartphone-mediated speaking and writing practice on learners' own devices, integrated with classroom ESP instruction.

Theoretical Considerations

This study draws on three perspectives. The first, Communicative Language Teaching (CLT), emphasizes meaningful, learnercentred communication, which mobile-assisted activities support by letting learners use language in real-world situations outside class (19). The second is Swain's Output Hypothesis: producing language helps learners notice knowledge gaps and improve, so tasks that encourage production with quick feedback aid learning (24, 25), supported by the Noticing Hypothesis, whereby learners improve by recognising performance-target gaps during feedback (26). The third is the Pedagogical Framework for Mobile-Assisted Language Learning (PF-4M), which identifies authenticity, personalisation, autonomy and context as central to effective mobile learning design (27). Together, these perspectives guide the study's exploration of how MALL builds language skills and sustains ESP engagement, consistent with recommendations that mobile learning be purposeful, learner-

centred and integrated into instruction rather than replacing classroom activities (28).

Novelty and Significance of the Study

Beyond its novelty, the study is significant for practice and policy, providing context-specific evidence on how mobile technologies can support productive language development where graduates' employability depends on speaking and writing English professionally. The findings offer practical guidance for ESP teachers, curriculum planners and policymakers and clarify the relationships among mobile-mediated practice, motivational orientation and rated language performance.

Methodology

Research Design

This study used a quasi-experimental mixed-methods design to examine how Mobile-Assisted Language Learning (MALL) relates to learners' speaking and writing skills, motivation and perceptions of the intervention. The mixed-methods approach was chosen because combining quantitative performance data with qualitative learner insights provides a fuller understanding than either method alone (29, 30).

The study adopted a pre-test/post-test non-equivalent comparison-group design: an experimental group received MALL-integrated ESP instruction and a comparison group received conventional ESP instruction over the same eight-week period. Random assignment was not feasible because students were enrolled in intact class sections within the institutional timetable; the assignment procedure is described under Participants and sampling below. This use of intact classes risked confounding from pre-existing group characteristics or classroom dynamics. To mitigate this and strengthen internal validity, baseline equivalence was established through pre-test comparisons on both outcome measures, both groups followed the same syllabus and learning outcomes and the same instructor delivered and standardized instruction and evaluation across groups, though instructor bias remains a potential confound. The study followed a pragmatic research approach combining quantitative and qualitative methods, appropriate for measuring learning outcomes while also understanding learners' experiences and views of mobile-assisted language learning.

Research Settings

The study was conducted at Yanbu English Language Institute, a constituent of the Royal Commission for Jubail and Yanbu, Saudi Arabia. English is the medium of instruction across engineering and technical specialization programs, requiring students to develop discipline-specific communicative competence alongside general English proficiency. The setting was considered particularly appropriate because productive language skills are essential for students' academic success and future professional communication in engineering and industrial environments (31).

Participants and Sampling

The participants included 60 male students enrolled in the English Communication (ENG 101) course during their first year of specialization studies. All had completed the Preparatory Year Program and were classified at the B1-B2 proficiency level per institutional placement procedures aligned with the CEFR. The sample reflected the total number of eligible students in the two intact course sections during the study period. A purposive sampling strategy ensured participant homogeneity and intervention feasibility. Inclusion required that participants: (a) be enrolled in ENG 101, (b) have completed the Preparatory Year Program, (c) demonstrate B1-B2 proficiency per institutional placement and (d) possess regular access to a smartphone and internet connectivity; students who did not meet these criteria were excluded. The final sample consisted of two intact class sections: an experimental group of 30 students who received MALL-integrated ESP instruction and a comparison group of 30 students who received conventional ESP instruction. Both groups were taught by the same instructor and followed the same curriculum objectives throughout.

Participants were not randomly assigned to conditions, individually or by cluster. Random assignment of individual students was not permitted by the institution, since students were already enrolled in intact class sections fixed by the central timetable and could not be reallocated for research purposes. The two intact sections were allocated to the experimental and comparison conditions by the researcher before baseline testing and therefore without knowledge of any student's pre-test performance. The design is consequently a non-equivalent comparison-group

quasi-experiment rather than a randomised controlled trial. Because the absence of randomisation leaves open the possibility that the groups differed before the intervention, baseline equivalence was tested empirically on both outcome measures before any post-test comparison was interpreted and the results are reported at the start of the Results section. All participants in both groups were drawn from the same cohort, programme year and CEFR placement band (B1-B2) and both sections were taught by the same instructor, followed the same syllabus and were assessed with the same instruments and rubrics.

With respect to proficiency, all participants were classified by the institutional placement procedure at the composite B1-B2 band of the CEFR. That procedure records this band as a single classification; it does not assign learners individually to B1 or B2 and it does not retain a continuous placement score. No individual proficiency measure was therefore available for any participant in either group, so whether MALL affected lower- and higher-proficiency learners differently could not be tested. This is a constraint of the available records rather than an analytic choice and it is acknowledged in the Limitations section. Testing the differential effect of MALL across proficiency levels requires a design in which an individually assigned CEFR level, or a continuous proficiency score, is collected at baseline; this is identified as a priority for future research.

Intervention Materials and Procedures

Two mobile applications were employed as the primary intervention tools, both used on learners' own personal smartphones; no institutional devices, tablets, or desktop computers were issued and regular smartphone and internet access was an inclusion criterion. Mondly supported speaking development through structured speaking activities, pronunciation practice, speech-recognition feedback and simulated conversational tasks. Write and Improve by Cambridge supported writing development through guided writing activities, automated feedback and iterative revision. These applications were selected for their direct alignment with the study's focus on productive language development, providing structured speaking practice and feedback-supported writing revision.

The language tasks on the two platforms were therefore of four broad types: controlled pronunciation and repetition practice; simulated dialogic and conversational tasks; guided written production in response to set prompts; and revision of written drafts in response to automated feedback.

The intervention ran for eight weeks in three phases. Phase 1 involved baseline speaking and writing assessments and participant orientation to the two applications. Phase 2 comprised the intervention itself, during which experimental-group students participated in structured mobile-assisted speaking and writing activities integrated into their timetabled ESP instruction and completed approximately 30 minutes of daily self-directed practice on the mobile applications outside class. Phase 3 involved post-intervention speaking and writing assessments for both groups, followed by the motivation questionnaire for the experimental group. Teacher involvement was continuous: the same instructor delivered the timetabled ESP instruction to both groups, introduced and modelled the mobile tasks in class for the experimental group, set the weekly mobile activities and linked them to the ESP syllabus, reviewed the weekly reflective journals and led classroom follow-up discussions in which learners reported their application use and reflected on the assigned activities. These procedures also served as the fidelity check for the intervention, encouraging adherence to the planned daily practice schedule, though independent out-of-class practice was assessed primarily through participant self-report rather than application usage logs. The present report does not include a session-by-session breakdown of the weekly task sequence.

The comparison group received conventional ESP instruction over the same eight-week period, delivered by the same instructor and covering the same syllabus content, learning outcomes and assessment specifications. Instruction was classroom-based and textbook-supported, comprising teacher-led presentation, in-class speaking activities and written assignments submitted on paper or through the institutional learning management system with teacher-provided feedback. No structured mobile application practice or additional out-of-class self-directed practice was assigned to this group.

Regarding the authenticity of the communicative situations encountered, the mobile activities were embedded within an ESP course whose content and assessment target the discipline-specific academic and workplace communication required in engineering and industrial settings and the in-class tasks that framed the mobile practice drew on that course content. The two applications themselves, however, deliver general-purpose English content rather than domain-specific material, so the professional genres of the students' field, such as laboratory and progress reports, technical briefings, safety instructions and workplace correspondence, were addressed through the ESP classroom component and the teacher-set framing tasks rather than through the applications' own materials. The intervention therefore provided partial rather than comprehensive exposure to authentic professional genres, treated as a limitation and design implication below.

Research Instruments

Five instruments were used to collect data. The first was a 20-item motivation questionnaire, adapted and modified to focus on productive language learning (32), using a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). It was administered to the experimental group only and showed satisfactory reliability for the full scale (Cronbach's $\alpha = 0.855$), the intrinsic subscale ($\alpha = 0.839$) and the extrinsic subscale ($\alpha = 0.872$).

The second instrument was a speaking assessment evaluating productive oral competence, operationalised through four analytic criteria: fluency, accuracy, pronunciation and coherence (33), each rated on a five-point scale for a total speaking score out of 20. The assessment thus measured rated productive oral performance on the assessed tasks rather than general oral proficiency and did not separately assess lexical range, grammatical complexity, or interactional competence: lexical and grammatical control were captured within accuracy and the organisation and connectedness of extended turns within coherence. It was administered individually under supervised conditions, with the pre-test and post-test using different but parallel prompts of the same task type and rubric.

The third instrument was a writing assessment evaluating productive written competence. It was

not genre-specific; both administrations used the same general ESP extended-response task format, requiring one continuous written response to a course-related communicative situation. The surviving assessment records do not preserve the verbatim prompts or a fixed named genre, so none is retrospectively assigned here. Pre-test and post-test used different but parallel prompts to reduce practice effects, with the same task format, administration conditions and analytic rubric. No fixed word limit or separately timed duration was recorded; each response was completed individually in one regular timetabled class session, under supervision and without reference materials. Writing was rated independently by two trained raters on organization, vocabulary range, grammatical accuracy and communicative clarity (34), each criterion scored 1 to 5 for a maximum total of 20, with the same scoring procedure applied at both testing points and in both groups. The fourth instrument consisted of weekly reflective journals completed by experimental-group participants, eliciting their experiences, perceptions, challenges and reflections on using mobile applications for productive language learning. The fifth was a structured classroom observation checklist documenting learner engagement with speaking and writing activities, peer interaction, use of feedback features and learner independence during classroom sessions. Two trained raters independently scored all speaking and writing assessments. Pearson correlations between the raters' scores were high for speaking ($r = 0.878$) and writing ($r = 0.857$).

Data Collection Procedures

Data collection was conducted over eight weeks. Pre-test assessments of speaking and writing performance were administered before the intervention. Throughout the intervention, experimental-group participants completed weekly reflective journals and participated in classroom observations. Following the intervention, post-test assessments were administered to both groups and the motivation questionnaire was then administered to the experimental group. All quantitative and qualitative data were collected and stored electronically for analysis.

Data Analysis

Quantitative data were analyzed using descriptive and inferential statistics. Means and standard deviations summarized participant performance. Independent-samples t-tests established baseline equivalence between groups. Mixed-design analyses of variance (ANOVAs) examined differences between groups across time, with effect sizes reported as partial eta squared (η^2). Pearson correlation analyses examined associations between motivation scores and productive language outcomes. Statistical significance was set at $\alpha = 0.05$. Before inferential analyses, parametric assumptions were evaluated: inspection of skewness, kurtosis, histograms and Q-Q plots indicated acceptable normality; boxplots and standardized z-scores identified no extreme outliers; and Levene's test confirmed satisfactory homogeneity of variance for all relevant comparisons.

Qualitative data from reflective journals and classroom observations were analyzed using a six-phase thematic analysis procedure (35). All 240 journal entries were included; coding was conducted across the entire dataset and thematic saturation was achieved, as no substantively new themes emerged during later analysis. Classroom observations were used to corroborate and contextualize emerging themes and quantitative and qualitative findings were integrated through methodological triangulation.

Ethical Considerations

This study received ethical approval from the Academic and Research Oversight Committee of the English Language Department, Yanbu English Language Institute (YELI), Royal Commission for Jubail and Yanbu (IRB Approval No. IRB/25/23; Approval Date: September 9, 2025) and was conducted in accordance with the Declaration of Helsinki (2017). Written informed consent was obtained from all participants before data collection; participation was voluntary, with participants informed of their right to withdraw at any time without penalty or academic consequences. Participant confidentiality and

privacy were maintained and all data were anonymized before analysis.

Trustworthiness and Rigor

Several measures ensured methodological rigor. For the quantitative component, instrument reliability was established through Cronbach's alpha coefficients and inter-rater reliability procedures. For the qualitative component, credibility was enhanced through prolonged engagement, triangulation of reflective journals and classroom observations, examination of negative cases and inclusion of the complete journal dataset. Dependability and confirmability were strengthened through systematic coding and inter-coder agreement, which reached a substantial level (Cohen's $\kappa = 0.83$). Integrating quantitative and qualitative findings further enhanced the study's trustworthiness by providing multiple sources of evidence for interpretation.

Results

Productive Language Performance

Baseline equivalence was examined before any post-test comparison was interpreted. At pre-test, the experimental and comparison groups obtained almost identical speaking scores (experimental $M = 10.30$, $SD = 1.53$; comparison $M = 10.30$, $SD = 2.14$) and closely similar writing scores (experimental $M = 10.07$, $SD = 1.86$; comparison $M = 10.37$, $SD = 2.08$). Independent-samples t-tests confirmed that the two groups were statistically equivalent before the intervention, with no significant difference in speaking, $t(58) = 0.00$, $p = 1.000$, or writing, $t(58) = -0.59$, $p = 0.557$ and negligible effect sizes in both cases. Levene's test indicated homogeneity of variance for both baseline comparisons. The groups can therefore be regarded as comparable on both outcome measures before the treatment was introduced, which supports the interpretation of subsequent differences as intervention related. Full descriptive statistics for both time points are presented in Table 1. Both groups improved from pre-test to post-test, but the experimental group demonstrated greater gains in speaking and writing than the comparison group.

Table 1: Descriptive Statistics for Pre-test and Post-test Speaking and Writing Scores by Group (N = 60)

Group	Skill	Test	M	SD	Min	Max
Experimental	Speaking	Pre-test	10.30	1.53	8	13
		Post-test	15.30	1.70	12	18
	Writing	Pre-test	10.07	1.86	7	15
		Post-test	15.13	1.81	12	19
Comparison	Speaking	Pre-test	10.30	2.14	7	14
		Post-test	12.30	1.58	8	15
	Writing	Pre-test	10.37	2.08	6	15
		Post-test	12.47	2.05	7	16

Note: M = mean, SD = standard deviation, Min = Minimum, Max = Maximum.

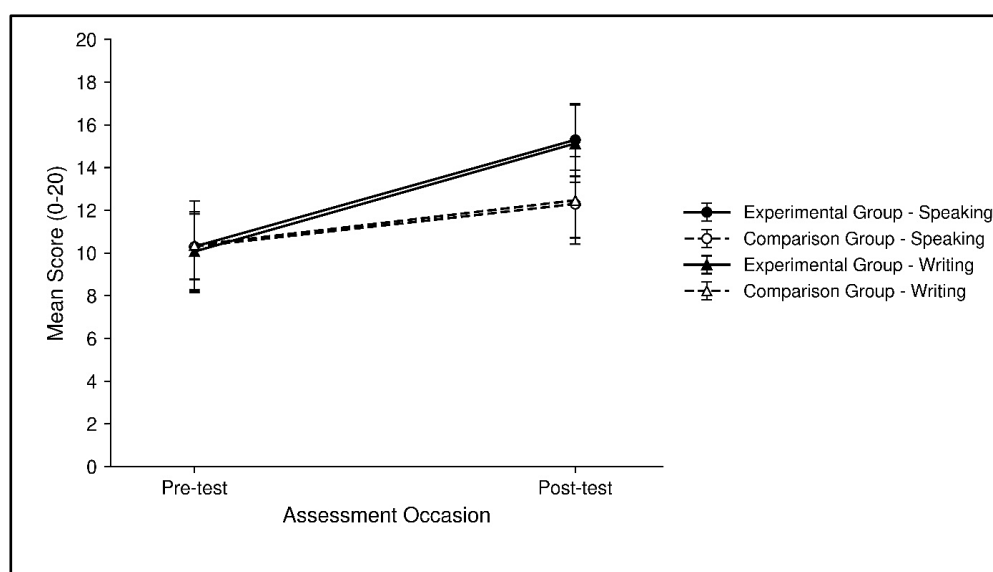


Figure 1: Mean Pre-test and Post-test Speaking and Writing Scores for the Experimental and Comparison Groups. Error bars represent ± 1 SD

Figure 1 presents the mean pre-test and post-test speaking and writing scores for both groups. The figure illustrates the larger gains among learners who received MALL-integrated instruction. Mixed-design analyses of variance (ANOVAs) were conducted to test the observed differences, as shown in Table 2. Significant Group $\times$ Time interaction effects were found for speaking, $F(1, 58) = 20.61$, $p < 0.001$, $\eta p^2 = 0.262$ and writing, $F(1, 58) = 19.31$, $p < 0.001$, $\eta p^2 = 0.250$. Thus, learners

receiving MALL-integrated instruction improved significantly more than those receiving conventional instruction, with large effect sizes for both outcomes. Qualitative evidence supported these results. Reflective journals frequently described improved speaking confidence and writing performance, while classroom observations documented task completion, collaborative interaction and feedback-based revision.

Table 2: Mixed-Design ANOVA Results for Speaking and Writing Performance

Skill	Effect	F	df	p-value	ηp^2
Speaking	Group	23.42	1, 58	< 0.001	0.288
	Time	112.18	1, 58	< 0.001	0.659
	Group $\times$ Time	20.61	1, 58	< 0.001	0.262
Writing	Group	10.01	1, 58	0.002	0.147
	Time	112.68	1, 58	< 0.001	0.660
	Group $\times$ Time	19.31	1, 58	< 0.001	0.250

Note: df = Degrees of Freedom, F = F-ratio (test statistic), ηp^2 = partial eta squared.

Table 3: Descriptive Statistics for Motivation Questionnaire Scores (n = 30)

Subscale	M	SD
Intrinsic Motivation	3.40	0.27
Extrinsic Motivation	3.94	0.27
Overall Motivation	3.67	0.19

Note: M = Mean, SD = Standard Deviation.

Motivational Orientations toward MALL

Post-intervention motivation was measured in the experimental group. As shown in Table 3, participants reported positive motivation toward MALL; extrinsic motivation was higher than intrinsic motivation and overall motivation was high. The questionnaire was administered only after the intervention and only to the experimental group because it assessed responses to the MALL experience. Pearson product-moment correlations for the experimental group are presented in Table

4. Intrinsic motivation was positively associated with speaking ($r = 0.429, p = 0.018$), writing ($r = 0.478, p = 0.008$) and overall productive performance ($r = 0.535, p = 0.002$). Extrinsic motivation was not significantly associated with speaking ($r = 0.051, p = 0.789$), writing ($r = -0.061, p = 0.751$), or overall productive performance ($r = -0.008, p = 0.968$). Overall motivation had small, nonsignificant associations with speaking ($r = 0.344, p = 0.062$) and writing ($r = 0.302, p = 0.105$), but was significantly associated with total productive performance ($r = 0.380, p = 0.039$).

Table 4: Pearson Correlations Between Motivation and Productive Skill Performance (Experimental Group, n = 30)

Motivation Measure	Speaking	Writing	Productive Total
Intrinsic Motivation	0.429*	0.478**	0.535**
Extrinsic Motivation	0.051	-0.061	-0.008
Overall Motivation	0.344	0.302	0.380*

Note: * $p < 0.05$, ** $p < 0.01$.

Learner Perceptions of MALL

Weekly reflective journals and classroom observations were used to examine learners' experiences. The thematic analysis of 240 journal entries generated seven themes summarized in Table 5. Engagement and enjoyment were reported most frequently, followed by perceived improvements in speaking and writing. Learners commonly described the applications as motivating, easy to use and supportive of

independent practice. One participant stated, "Using the mobile applications every day made speaking practice easier and increased my confidence during classroom discussions." Another reported, "The immediate feedback helped me recognize my writing mistakes and improve them before submitting my work." Participants also described greater speaking confidence, closer attention to writing accuracy and appreciation of immediate feedback.

Table 5: Frequency Distribution and Interpretation of Reflective Journal Themes (N = 240)

Theme	Frequency (f)	Percentage (%)	Interpretation
Engagement and Enjoyment	72	30.0	Learners reported high levels of interest, enjoyment and active participation during mobile-assisted learning activities.
Speaking Improvement	58	24.2	Learners perceived noticeable improvement in speaking confidence, fluency and oral communication.
Writing Improvement	49	20.4	Participants reported greater attention to writing accuracy, organization and revision.
Usefulness and Convenience	31	12.9	Mobile applications were viewed as flexible, accessible and supportive of learning beyond the classroom.
Feedback and Self-correction	16	6.7	Learners valued immediate feedback and opportunities to revise and improve their language performance.

Challenges and Difficulties	9	3.8	A small number of learners experienced technical issues, internet connectivity problems, or initial difficulty using some application features.
Peer Interaction and Support	5	2.0	Some learners highlighted collaborative learning and peer encouragement during mobile-assisted activities.
Total	240	100.0	Not applicable

Note: f = Frequency.

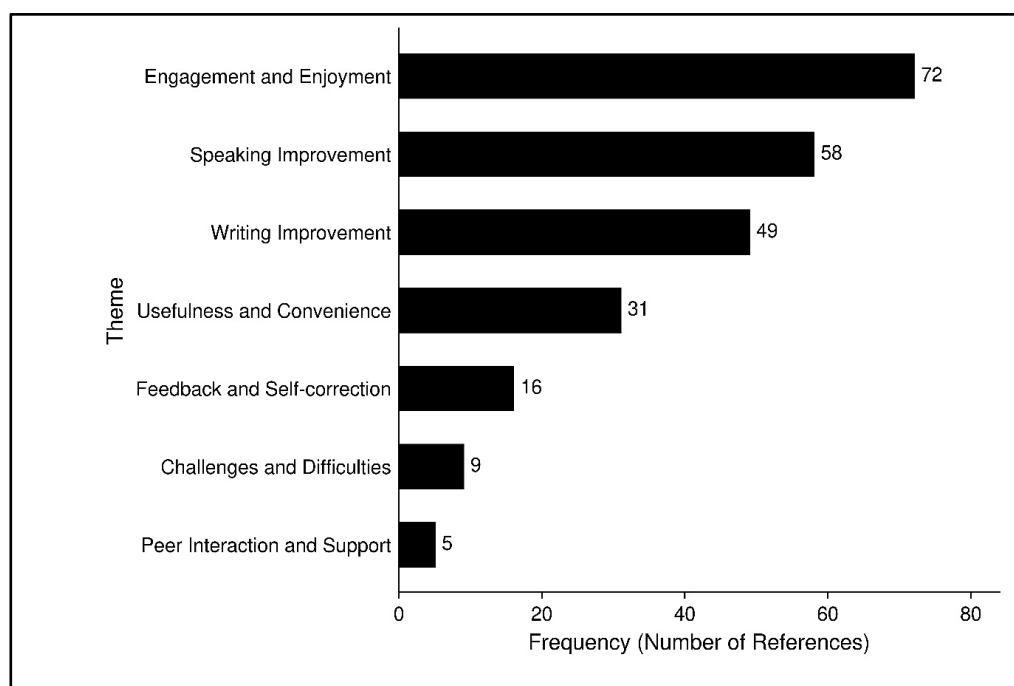


Figure 2: Frequency Distribution of Reflective Journal Themes (N = 240)

Figure 2 shows the frequency of themes identified across the 240 journal entries. Positive comments predominated, although a few learners reported internet problems, unfamiliar app features and occasional technical difficulties. Such comments became less frequent as learners gained familiarity with the applications.

Classroom engagement was examined across 12 observation sessions. Mean ratings are reported in Table 6. Task engagement received the highest rating and high scores were observed for participation, interaction and independent

learning. Figure 3 presents mean ratings across the principal observation categories. Classroom observations suggested greater learner independence and more effective use of feedback as the intervention progressed: learners initially depended more on the teacher but later worked more independently, collaborated with peers and used application feedback more effectively. Journal entries similarly showed fewer reports of technical problems and more comments about confidence, enjoyment and language improvement.

Table 6: Mean Classroom Observation Ratings Across 12 Sessions (n = 30)

Observation Category	M	SD
Task Engagement	4.43	0.59
Participation and Interaction	4.20	0.65
Overall Engagement	4.22	0.54
Independence and Initiative	4.13	0.60
Use of Feedback Features	4.10	0.63

Note: M = mean, SD = Standard Deviation.

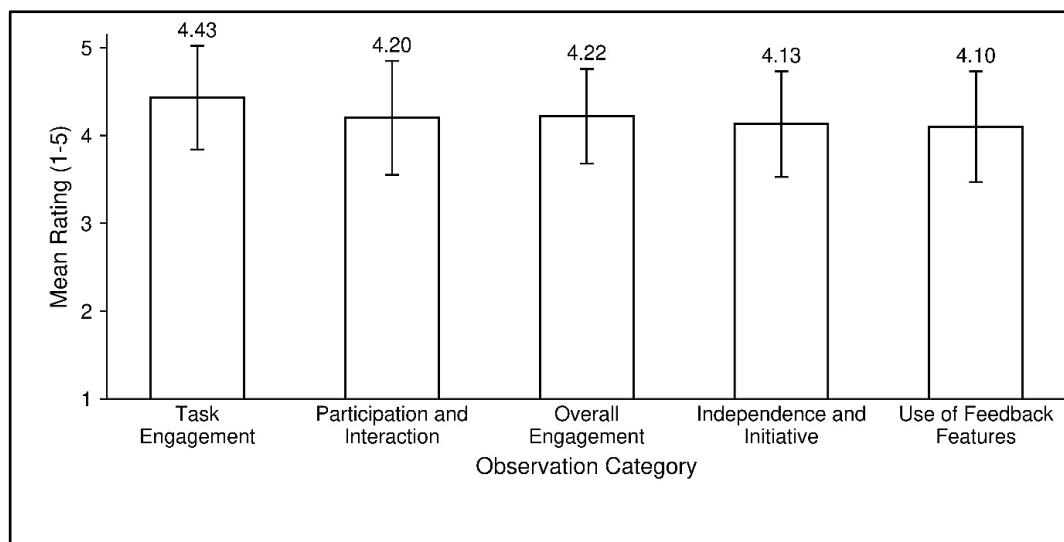


Figure 3: Mean Classroom Observation Ratings by Observation Category (Experimental Group, $n = 30$). Error bars represent ± 1 SD

Discussion

Productive Language Performance

The significant Group $\times$ Time interactions show that the experimental group achieved greater speaking and writing gains than the comparison group. These findings accord with research indicating that mobile-assisted environments can support language development through repeated practice, immediate feedback and sustained productive-language engagement (36, 37). Similar improvements in motivation and language achievement have been reported among Saudi preparatory-year learners using MALL (38). The results also support pedagogically driven, rather than technology-led, curriculum integration (39) and are consistent with Communicative Language Teaching and the Output Hypothesis, which emphasize active language production in second-language development.

Situating these effects against previous work shows both convergence and divergence. The direction and magnitude of the gains are consistent with Burston's meta-analysis of two decades of MALL research, which reported a positive but moderate aggregate effect on learning outcomes (36) and with the speaking gains reported for mobile-assisted project-based learning in a comparable EFL setting (14). They also align with Saudi evidence of improved speaking through mobile practice (19) and improved paragraph writing through mobile-mediated peer review (20) and with the motivational and receptive gains reported among Saudi preparatory-year learners

(38). The present findings extend that Saudi work in one specific respect: those studies addressed a single productive skill, an attitudinal outcome, or receptive skills, whereas the present study measured rated speaking and writing within the same design and comparison-group structure. Discrepancies are equally informative. Studies of stand-alone commercial applications used without instructional integration have reported markedly smaller or inconsistent gains (13) and reviews of the field have concluded that outcomes depend on pedagogical integration rather than on the technology itself (22, 23). A plausible contextual explanation for the larger effects observed here is that the mobile tasks were not free-standing but were set, modelled and followed up in class by the same instructor who delivered the ESP syllabus and were completed by learners with a clear occupational reason to improve their productive English. Two further contextual differences should be noted when comparing effect sizes: the present sample comprised intermediate ESP learners in a technical college rather than general EFL learners and the outcomes were rated performances rather than the vocabulary or self-report measures that dominate the comparison literature (7, 18).

The journal and observation findings help explain the performance gains by documenting confidence, task completion, collaboration and feedback-based revision. This pattern supports evidence that learner-centered practices and appropriate pedagogical support improve language outcomes (40) and that combining conventional and digital

instruction can enhance speaking proficiency beyond conventional learning management systems (41).

Nevertheless, the experimental group completed additional structured mobile activities outside regular instruction and therefore received more learning exposure than the comparison group. Improvements may consequently reflect the combined effects of MALL, additional practice, engagement and Hawthorne or novelty effects. Baseline equivalence and controlled classroom procedures strengthen internal validity, but the design does not isolate the effect of mobile technology. Future studies should use active control groups receiving equivalent non-mobile practice, extend intervention duration and collect repeated motivation and engagement measures.

Motivational Orientations toward MALL

Although learners reported high overall and extrinsic motivation, only intrinsic motivation was consistently related to speaking, writing and overall productive performance. This finding is consistent with Self-Determination Theory, which associates autonomous motivation more strongly with learning quality and performance than externally regulated motivation (42). Learners who participated because of interest, enjoyment and perceived value tended to achieve better outcomes, suggesting that access to mobile technology alone may be insufficient without meaningful engagement. The absence of significant relationships between extrinsic motivation and performance similarly indicates that external incentives alone may not sustain language development in English for Specific Purposes contexts.

The pattern in which intrinsic but not extrinsic motivation was associated with performance is consistent with Self-Determination Theory (42) and with studies reporting motivational benefits of mobile and computer-assisted instruction (15), but it qualifies the frequent claim that MALL raises motivation in general. Studies reporting global motivational gains have typically used undifferentiated motivation scales (19, 43), whereas separating the two orientations here shows that the higher of the two, extrinsic motivation, bore no relationship to speaking or writing outcomes. A contextual explanation is that extrinsic motivation in this setting is tied to course

credit and graduation requirements that operate irrespective of the delivery mode, so it is unlikely to discriminate between learners within a single course. The finding is consistent with reviews concluding that access to mobile technology is not itself sufficient for learning gains (22, 23).

These results must not be interpreted as evidence that MALL increased motivation. Motivation was measured only after the intervention and only in the experimental group, without a pre-intervention or comparison-group measure. The findings therefore represent post-intervention perceptions and associations. Positive responses may also partly reflect short-term enthusiasm for unfamiliar technology.

Learner Perceptions and Implementation

The qualitative findings complement the performance and motivation results by showing that learners generally experienced MALL as engaging, useful and manageable. Frequent perceptions of speaking and writing improvement aligned with the quantitative gains, while the observation data documented increasing independence, peer interaction and effective use of feedback. The agreement among journals, observations and performance data strengthens the interpretation that MALL can support productive-language development among Saudi ESP learners (23).

The reported internet, application-familiarity and technical difficulties mirror challenges identified in reviews of smartphone-assisted language learning (44). Their decline over time suggests that orientation and continued use may reduce some implementation barriers. The overall findings also accord with Saudi higher education evidence that carefully designed technology-enhanced English curricula can promote engagement and communication-oriented outcomes when supported by sound pedagogical planning (45). Successful implementation therefore depends on both learner engagement and educators' readiness to integrate digital tools appropriately, as emphasized in recent language-education research (46).

Conclusion

This study examined the relationship between Mobile-Assisted Language Learning (MALL) and productive language development among Saudi English for Specific Purposes (ESP) learners using

a quasi-experimental mixed-methods design. The findings indicate that MALL-integrated instruction was associated with greater improvements in speaking and writing than conventional instruction. Learners also reported positive motivational orientations toward MALL, while reflective journals and classroom observations demonstrated high levels of engagement, perceived usefulness and satisfaction throughout the intervention.

The study contributes to the growing body of research on technology-enhanced language learning by providing context-specific evidence from a Saudi technical higher education setting and by focusing on productive language skills rather than receptive outcomes alone. By integrating performance measures with motivational and qualitative data, the findings offer a comprehensive understanding of how mobile-assisted learning can support productive language development in ESP contexts. The results suggest that well-designed MALL activities, combined with meaningful feedback and sustained learner engagement, can serve as an effective complement to conventional ESP instruction.

Implications and Contributions

This study contributes to the growing body of evidence supporting the pedagogically meaningful integration of Mobile-Assisted Language Learning (MALL) in English for Specific Purposes (ESP) education. By demonstrating improvements in speaking and writing performance alongside positive learner engagement and motivation, the findings extend current MALL research beyond receptive language skills within a Saudi technical higher education context. The study also contributes methodologically by integrating objective performance measures with learner motivation, reflective journals and classroom observations through a mixed-methods design. From a practical perspective, the findings provide guidance for ESP instructors, curriculum developers and higher education institutions seeking to incorporate mobile technologies into language instruction. Carefully designed mobile-assisted activities, supported by meaningful feedback and learner-centered pedagogical practices, may enhance productive language development while promoting learner autonomy and sustained engagement in technology-enhanced language learning environments.

Limitations

Several limitations qualify these findings. The study was conducted with male ESP students from a single Saudi technical college over an eight-week intervention period, which restricts generalizability to female learners, other institutions, other disciplines and longer timeframes. Participants were not randomly assigned to conditions; intact class sections were used and although baseline equivalence was established on both outcome measures and instruction, syllabus and assessment were held constant, unmeasured group-level differences cannot be excluded. The experimental group also received additional out-of-class practice, so the observed gains reflect the combined effect of mobile mediation and increased exposure rather than the effect of mobile technology in isolation. Motivational orientations were measured only once, after the intervention and only in the experimental group, so no claim can be made that MALL changed motivation. Because institutional placement recorded proficiency only as a composite B1-B2 band, with no individually assigned CEFR level and no continuous placement score, the study contains no measure by which lower- and higher-proficiency learners could be distinguished; whether MALL benefited the two differently therefore could not be tested. A further limitation concerns the assessment instruments: the study records identify the speaking and writing assessments as parallel task formats but do not preserve the verbatim prompts, a fixed named writing genre, a word limit, or a separately timed duration. Consequently, comparability rests on their shared task format, rubric, supervised classroom administration and use of one timetabled class session. Out-of-class practice was recorded through self-report rather than application usage logs. Finally, the two applications provided general-purpose rather than discipline-specific content, so exposure to authentic professional genres depended on the classroom component of the course. The mixed-methods design and the triangulation of quantitative and qualitative data nevertheless strengthen the credibility of the results.

Future research

Future research should address these limitations directly. Priorities include the use of an active control group that receives an equivalent volume

of non-mobile practice, so that the effect of mobile mediation can be separated from the effect of additional exposure; longer interventions with delayed post-tests to establish whether gains are retained; repeated measurement of motivation before, during and after the intervention and in both groups; and larger samples with continuous proficiency measures, which would permit a properly powered test of whether MALL benefits lower- and higher-proficiency learners differently. Further work should also examine mobile applications that deliver discipline-specific professional genres, include female learners and multiple institutions, use application usage logs rather than self-report to record out-of-class practice and investigate the integration of artificial intelligence with mobile learning to support learner autonomy, self-regulation and communication skills across ESP disciplines.

Abbreviations

AI: Artificial Intelligence, CEFR: Common European Framework of Reference for Languages, CLT: Communicative Language Teaching, EFL: English as a Foreign Language, ESP: English for Specific Purposes, IRB: Institutional Review Board, MALL: Mobile-assisted Language Learning, PF-4M: Pedagogical Framework for Mobile-assisted Language Learning.

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Author Contributions

Saeed Saleh Alkahtani (sole author) was responsible for all aspects of this work, in line with the CRediT authorship taxonomy: Conceptualization, Methodology, Investigation, Formal analysis, Data curation, Writing – original draft, Writing – review & editing, Supervision and Project administration.

Conflict of Interest

The author declares no conflict of interest.

Data Availability

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request. Data are not publicly available due to ethical and confidentiality considerations associated with participant information.

Declaration of Artificial Intelligence (AI) Assistance

The author acknowledges the use of artificial intelligence (AI)-assisted tools, including ChatGPT (OpenAI) and Grammarly, during the preparation of this manuscript. These tools were used solely to support language refinement, editing, formatting and manuscript organization. No AI tool was used for data generation, data collection, data analysis, interpretation of findings, statistical analysis, or the formulation of research conclusions. All intellectual content, methodological decisions, analysis, interpretations and conclusions were developed and verified by the author. The author accepts full responsibility for the accuracy, originality and integrity of the manuscript.

Ethics Approval

This study was conducted in accordance with institutional ethical guidelines governing research involving human participants. Ethical approval was obtained from the relevant institutional review board prior to data collection (IRB Approval Number: IRB/25/23; Date: September 09, 2025). Participation was voluntary, informed consent was obtained from all participants and confidentiality and anonymity were maintained throughout the study.

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