

EMPOWERING LANGUAGE LEARNING FOR SUSTAINABLE DEVELOPMENT: MOBILE-ASSISTED APPROACHES IN ENHANCING PRODUCTIVE AND RECEPTIVE SKILLS IN HIGHER EDUCATION

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Abstract

In the rapidly evolving landscape of higher education, language proficiency is integral for equipping students with the competencies necessary for sustainable development. This study explores the transformative potential of Mobile-Assisted Language Learning (MALL) in enhancing both productive (speaking and writing) and receptive (listening and reading) language skills among university students. As digital technologies continue to reshape pedagogical frameworks, MALL provides flexible, accessible, and interactive learning modalities tailored to diverse learner needs. This research examines the integration of mobile applications within foreign language curricula and evaluates their efficacy in fostering language acquisition within sustainable learning environments. By utilizing mobile learning platforms, students engage in continuous, autonomous learning, thereby enhancing self-efficacy and communication skills for real-world applications. The findings underscore MALL's capacity to support individualized language development, foster collaborative engagement, and facilitate social interaction, all of which contribute to global employability and professional adaptability. This study advocates for the systematic integration of MALL into higher education curricula, emphasizing its role in cultivating sustainable, adaptive, and future-ready language learners equipped for success in an increasingly interconnected world.

Keywords: Mobile-Assisted Language Learning (MALL), Productive Skills, Receptive Skills, Digital Technology

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Introduction

In the rapidly evolving world of the 21st century, language proficiency has emerged as a cornerstone of global communication and professional success. As the demand for multilingual capabilities increases across diverse sectors, the need for effective language education strategies becomes ever more critical. In the context of higher education, the integration of English as a Foreign Language (EFL) learning with the principles of Education for Sustainable Development (ESD) presents a transformative opportunity to foster not only linguistic competence but also holistic skills that are vital in an interconnected and diverse world.

This study is born out of the growing realization that traditional language learning methods, while essential, may no longer suffice in preparing students for the complex, fast-paced global environment. Educational systems must evolve to meet the needs of a digital generation. ESD in language learning is no longer a distant ideal, but a pressing necessity. The purpose of this study is to investigate the effectiveness of ESD approaches, particularly in the realm of foreign language education, at the higher education level. This study specifically explores the integration of Mobile-assisted Language Learning (MALL) as an innovative strategy that embodies the core values of sustainability—flexibility, accessibility, and lifelong learning—while simultaneously improving both receptive and productive language skills in students.

The objective of this study is to examine how Mobile-assisted Language Learning (MALL) can enhance language acquisition through sustainable educational practices. It aims to identify the key benefits and challenges of integrating mobile technology into foreign language curricula and assess its impact on student engagement, self-directed learning, and overall language proficiency in higher education. Furthermore, this research seeks to provide practical recommendations for educators on effectively incorporating MALL into sustainable learning environments.

The primary issue under examination is the gap between traditional, classroom-based foreign language teaching methods and the rapidly advancing technology-driven learning environments. As education transitions into the digital age, students are increasingly relying on mobile technologies to supplement their learning. However, there is limited empirical study exploring how these technological tools can be effectively harnessed within the framework of ESD in higher education to enhance language learning outcomes.

The significance of this study lies in its potential to bridge this gap, offering valuable insights into how mobile technology can serve as a vehicle for sustainable language education. By incorporating mobile-assisted strategies into the curriculum, universities can provide students with more flexible and engaging learning experiences. Furthermore, this study seeks to contribute to the ongoing discourse on how ESD principles can be practically applied

in foreign language education, fostering a new generation of learners who are linguistically proficient and equipped with the skills necessary for sustainable development in a globalized world.

This study not only aligns with the global movement towards more inclusive, sustainable education systems but also addresses the pressing need for educational methodologies that can keep pace with technological advancements and the evolving demands of higher education. By examining the intersection of language learning and sustainability, this study aims to provide both theoretical and practical contributions to the field of education, while offering an innovative framework for integrating Mobile-assisted Language Learning into future pedagogical practices.

Literature Review

The integration of Mobile-assisted Language Learning (MALL) in higher education has gained attention for its ability to enhance receptive and productive language skills. As technology shapes education, MALL has become a key tool for fostering sustainable learning. This literature review highlights recent developments in MALL, focusing on its impact on language skills, its role in sustainable education, and its application in higher education. Additionally, this review incorporates recent research on MALL, examining its effectiveness, challenges, and emerging trends in digital language learning.

Mobile-Assisted Language Learning (MALL) in Higher Education

Mobile-assisted Language Learning (MALL) refers to the use of mobile devices, such as smartphones and tablets, to support language learning outside traditional classroom settings (Stockwell, 2018). MALL has been identified as a transformative pedagogical approach, offering learners increased access to language learning resources, flexibility in learning schedules, and personalized learning experiences. According to Lai and Zhao (2022), the accessibility and convenience of mobile technology have made it a popular tool in higher education, where learners can engage with language learning apps, podcasts, and video materials, thus extending the learning experience beyond the confines of the classroom.

In the context of higher education, MALL offers students the opportunity to practice language skills at their own pace and in real-world contexts. Study indicates that mobile devices can promote autonomy, increase learner motivation, and facilitate self-directed learning (Reinders, 2021). Furthermore, mobile-assisted tools often foster collaborative learning environments, encouraging peer interactions through social media platforms or language exchange apps, which enhances the overall learning experience.

Mobile-Assisted Language Learning (MALL)

The Mobile-assisted Language Learning (MALL) utilizes mobile devices like smartphones and tablets to support and enhance language acquisition through a variety of interactive tools and applications. Its flexibility, accessibility, and portability make mobile devices ideal for language learners, enabling continuous learning beyond the classroom and in real-world contexts. MALL provides opportunities for personalized, learner-centered practice, allowing students to improve their language skills at any time and place. It incorporates a range of interactive learning tools such as language learning apps, dictionaries, games, and social media platforms, which engage learners in active language use. These tools often include vocabulary games, pronunciation exercises, and real-time interactions with native speakers, improving both comprehension and production. Many MALL applications also use task-based learning, where learners complete tasks requiring the use of the target language, further enhancing language proficiency. Apps like Duolingo and Babbel personalize the learning experience by adapting tasks to the learner's proficiency level, while platforms like HelloTalk and Tandem enable real-time communication with native speakers, bridging the gap between classroom learning and practical language use. Additionally, MALL integrates multimedia tools, including audio, video, and visuals, to engage learners through multiple sensory channels, improving both receptive and productive language skills.

Challenges of Mobile-Assisted Language Learning

Despite the numerous benefits of Mobile-assisted Language Learning (MALL), several challenges must be addressed. Technological limitations, such as limited access to reliable internet connections or inadequate device capabilities, can hinder the effectiveness of MALL, as learners may not have access to the necessary tools to fully engage with advanced language learning applications (Stockwell, 2018). Additionally, mobile devices can be a source of distraction, as learners may be tempted to switch to social media or other non-educational apps (Reinders, 2021). To combat this, learners need to remain disciplined and motivated, and some apps may include features that help minimize distractions during study sessions (Lai & Zhao, 2022). Lastly, while MALL offers convenience and engagement, it may not support deep, conceptual learning as effectively as traditional classroom settings. Complex grammatical concepts or cultural nuances, for instance, may be more difficult to teach through mobile platforms, as they often require in-person interaction and more extensive practice to fully grasp (Chapelle, 2021).

Effective MALL Applications and Examples

1. Duolingo: Duolingo is a widely-used MALL platform that offers a gamified learning experience to help learners improve vocabulary, grammar, and pronunciation. Suitable for all proficiency levels, it offers

a wide range of languages to choose from. Sample Usage: A student preparing for an English proficiency exam can use Duolingo's daily exercises to practice vocabulary and sentence structures in an engaging format.

2. Tandem: Tandem connects learners with native speakers globally, facilitating language exchange through text, audio, and video calls. This real-time interaction helps learners practice speaking and listening while gaining authentic cultural insights. Sample Usage: A business professional learning Spanish can use Tandem to have weekly conversations with a native Spanish speaker, improving fluency and pronunciation.

3. HelloTalk: Similar to Tandem, HelloTalk allows learners to connect with native speakers for language exchange, supporting practice across all four language skills (reading, writing, speaking, and listening) through text, voice messages, and voice calls. Sample Usage: A university student studying French can exchange text and voice messages with a native speaker, receiving instant corrections and feedback on grammar and pronunciation.

4. Babbel: Babbel focuses on practical language use in real-life scenarios, making it ideal for learners looking to apply their language skills in everyday contexts. Its interactive lessons adapt to the learner's progress and needs, ensuring an engaging experience. Sample Usage: A traveler planning a trip to Italy can use Babbel's lessons on ordering food and asking for directions to confidently communicate with locals. Mobile-assisted Language Learning (MALL) has revolutionized the

way language is learned, providing learners with flexible, interactive, and personalized opportunities to enhance both receptive and productive language skills. While challenges remain in terms of technology access and learner discipline, the advantages of MALL in promoting language proficiency and engagement are undeniable. As mobile devices continue to evolve, the future of MALL holds great promise for language learners worldwide, offering a dynamic and sustainable approach to language acquisition.

Sustainable Learning and the Role of MALL

Sustainable learning focuses on creating accessible, flexible learning environments that meet the evolving needs of students, with an emphasis on lifelong learning and continuous development (OECD, 2020). MALL plays a crucial role in promoting sustainable learning by offering flexible, learner-centered language acquisition opportunities. Chapelle (2021) notes that the mobility and convenience of mobile devices align with sustainability in education, as they enable learners to engage in language learning anytime, anywhere. This flexibility makes learning more accessible and encourages learners to take ownership of their educational journey, a core principle of sustainable development in education.

In higher education, MALL contributes to inclusive and adaptive learning environments by accommodating diverse learning styles. Mobile tools cater to various needs, supporting visual, auditory, and kinesthetic learners (Liu et al., 2022). This personalized approach to

language learning fosters sustainable educational practices by allowing students to engage with content in ways that best suit their preferences. MALL in higher education should be clearly stated as a transformative approach that differs significantly from its application in primary and secondary education. At the university level, MALL is tailored to support autonomous and self-directed learning, enabling students to take full responsibility for their language development. Unlike in lower education levels, where structured guidance and teacher-led instruction are dominant, MALL in higher education emphasizes flexibility, research-based learning, and real-world application of language skills. One key difference is the integration of academic and professional communication skills into mobile-assisted learning. University students use MALL platforms not just for basic language acquisition but also for specialized learning, such as academic writing, presentation skills, and industry-specific vocabulary (Reinders, 2021). For instance, higher education learners may engage in research-based language tasks, participate in online discussions, or create digital portfolios showcasing their linguistic progress, which is not typically emphasized in earlier education stages. Additionally, MALL in higher education encourages collaboration beyond classroom boundaries, allowing students to interact with international peers and engage in interdisciplinary discussions. Platforms such as Tandem and HelloTalk enable learners to practice their target language with native speakers across different fields of study,

enhancing both linguistic competence and cultural awareness (Chapelle, 2021). This contrasts with primary and secondary education, where MALL is often confined to structured classroom activities and gamified language learning experiences. Another fundamental distinction is the reliance on critical thinking and problem-solving skills in higher education MALL applications. Mobile-assisted learning at this level integrates real-world problem-solving scenarios, such as case studies and simulations, requiring students to apply their language skills in analytical contexts. In contrast, younger learners generally focus on basic comprehension, vocabulary building, and sentence structure through interactive exercises (Stockwell, 2018). Moreover, the use of advanced technological tools such as AI-driven language tutors, adaptive learning algorithms, and real-time feedback mechanisms plays a more significant role in higher education compared to other levels. University students benefit from AI-powered platforms like Grammarly and ELSA Speak, which provide sophisticated feedback on writing and pronunciation, aligning with the academic rigor required at this stage (Lai & Zhao, 2022). In summary, while MALL enhances language learning at all educational levels, its role in higher education is distinct due to its emphasis on autonomy, professional communication, global collaboration, critical thinking, and the integration of advanced technologies. The adaptability of MALL at this level ensures that students not only gain language proficiency but also

develop the competencies required for academic success and future career opportunities.

The literature highlights MALL's potential to enhance both receptive and productive language skills, as mobile devices provide students with interactive and authentic learning experiences that develop key linguistic competencies. By offering flexibility, accessibility, and personalized learning opportunities, MALL becomes an essential tool for promoting lifelong learning and preparing students for a globalized world.

Enhancing Receptive and Productive Skills through MALL

Receptive and productive language skills are essential components of foreign language proficiency. Receptive skills, including listening and reading, are vital for understanding and processing information, while productive skills—speaking and writing—are necessary for effective communication. Research on MALL's impact on these skills indicates that mobile applications are highly effective in enhancing both receptive and productive abilities.

For receptive skills, MALL enables learners to interact with authentic content, such as news articles, podcasts, and videos, which expose them to diverse language inputs (Chik, 2020). These tools allow learners to adjust their learning experiences to match their proficiency levels, offering the flexibility to practice listening and reading anytime and anywhere. This accessibility promotes sustained engagement, which is crucial for improving comprehension

skills (Sweeney & Stansfield, 2021). Regarding productive skills, mobile-assisted platforms provide features like voice recognition, real-time feedback, and writing prompts to help students enhance their speaking and writing abilities. Apps such as Duolingo and HelloTalk enable learners to practice speaking with native speakers, while writing apps offer targeted exercises and peer feedback to refine written expression (Godwin-Jones, 2021; Blin, 2021). These interactive tools create a supportive, user-friendly environment that encourages language production and skill improvement.

Productive and Receptive Skills in Language Learning

In the field of second language acquisition, productive and receptive skills are integral components that form the foundation for successful communication and comprehension. Productive skills, including speaking and writing, are essential for generating language output, whereas receptive skills, which encompass listening and reading, enable learners to understand and process incoming language input. Both skill sets are interdependent, and their development is critical in fostering proficient language users. This literature review explores the latest study on productive and receptive skills, their significance in language acquisition, and effective pedagogical approaches, focusing on recent studies published in high-impact journals (Q1) and their application in language learning environments.

Productive Skills: Speaking and Writing

Productive skills, including speaking and writing, are essential for learners to express their thoughts and ideas effectively in a foreign language. Speaking requires fluency, accuracy, and confidence, as it involves real-time communication. Writing, being more structured, allows learners to focus on grammar, vocabulary, and syntax. Both skills are vital for academic, professional, and social interactions in the target language.

Recent studies emphasize the role of technology in enhancing productive skills, particularly in higher education. Mobile-assisted tools, such as language exchange platforms and speech recognition software, offer interactive opportunities for learners to practice speaking and writing in authentic contexts. Godwin-Jones (2021) highlights platforms like HelloTalk and Tandem, which enable learners to engage with native speakers, improving speaking fluency and gaining feedback. These tools also promote intercultural communication, crucial for adapting to diverse language use in global settings. In academic contexts, writing requires clarity and coherence. Tools like Grammarly and ProWritingAid provide instant grammar and stylistic corrections, enhancing writing accuracy and fluency (Blin, 2021). Ducate & Lomicka (2022) argue that writing apps, such as Google Docs, foster peer review and collaboration, helping learners refine their work through social interaction and feedback. This peer engagement improves metacognitive awareness and writing proficiency. Task-Based Language Teaching (TBLT) also supports the

development of productive skills by encouraging learners to focus on meaningful communication rather than grammar form. Lai and Zhao (2022) note that TBLT, through real-world tasks such as debates or problem-solving activities, enhances speaking fluency, writing complexity, and overall language proficiency.

Receptive Skills: Listening and Reading

Receptive skills, encompassing listening and reading, are vital for language learners as they provide the foundation for language comprehension and enable learners to process and interpret language input. These skills are particularly important in academic and professional settings where the ability to understand lectures, read complex texts, and extract critical information is essential. Listening and reading skills complement productive skills by enhancing learners' capacity to process language, which in turn facilitates language output. Listening skills have gained increased attention with the rise of digital learning tools and multimedia resources. Chik (2020) emphasizes that interactive listening tools, such as podcasts, videos, and language learning apps, expose learners to authentic language use, improving their ability to understand natural speech patterns and vocabulary in context. The use of digital media allows learners to engage with a variety of accents, registers, and dialects, which prepares them for real-life communication in the target language. For instance, Duolingo and Rosetta Stone provide listening exercises that simulate real-life conversations, thereby strengthening the learners' ability to comprehend spoken

language in diverse contexts (Sweeney & Stansfield, 2021).

Another effective tool for enhancing listening skills is dictation software, which allows learners to listen to recordings and transcribe what they hear. According to Reinders (2021), dictation exercises help learners focus on accuracy and listening comprehension by requiring them to process spoken language at a higher level of attention. These exercises are especially effective in improving learners' ability to discern individual sounds and understand speech at natural speeds. Reading comprehension has traditionally been developed through extensive reading of texts, from academic papers to novels. However, a recent study shows that digital tools are now enhancing how learners approach reading. Sweeney and Stansfield (2021) suggest that interactive reading apps, such as Beelinguapp and Newsela, allow learners to read texts alongside translations or annotations, promoting better understanding and retention. These tools are particularly helpful for learners who are at different proficiency levels, as they allow for adaptive learning that suits the learner's current language ability. Collaborative reading has also been highlighted as an effective strategy to develop receptive skills. Liu, Cavanagh, & Hsu (2022) show that tools like Google Classroom enable students to engage in online discussions and annotations of reading materials, promoting critical thinking and a deeper understanding of texts. By interacting with peers, learners are encouraged to think critically about what they

read, leading to improved comprehension and retention.

Pedagogical Approaches for Enhancing Productive and Receptive Skills

The integration of Mobile-assisted Language Learning (MALL), Task-based Learning (TBL), and collaborative approaches have been proven to be effective in improving both receptive and productive skills. According to Chapelle (2021), MALL offers a flexible, accessible way for learners to develop these skills outside the classroom environment. By combining various digital tools with traditional language learning methods, educators can create a more dynamic and interactive learning experience that caters to the diverse needs of learners. In particular, mobile apps and collaborative platforms encourage learner autonomy, which is a critical aspect of sustainable language learning.

The use of interactive listening and reading materials alongside speaking and writing tasks creates a balanced language learning experience that encourages active engagement with both receptive and productive aspects of language. According to Lai and Zhao (2022), learners benefit most from a mixed approach that combines extensive practice in both receptive skills (such as listening to podcasts and reading texts) and productive skills (such as engaging in conversations or writing tasks), fostering a holistic language learning process. In conclusion, the development of both productive and receptive skills is crucial for language learners, particularly in higher education. With the

increasing reliance on digital tools and mobile technology, learners now have greater access to interactive and flexible platforms that facilitate language acquisition (Keadplang, 2024). Research highlights that mobile-assisted language learning, collaborative practices, and task-based approaches are effective strategies for enhancing both receptive and productive skills. As these teaching methods evolve, they contribute to creating a more engaging, sustainable, and effective language learning experience for students across the globe.

Discussion

The literature review underscores the transformative impact of Mobile-assisted Language Learning (MALL) in higher education, highlighting its role in enhancing both receptive (listening and reading) and productive (speaking and writing) language skills. Research by Stockwell (2018) and Reinders (2021) has emphasized that MALL promotes learner autonomy, enabling students to engage in self-directed and flexible learning environments. Studies also show that MALL fosters sustainable education by making language learning more accessible through mobile applications, adaptive learning platforms, and digital collaboration tools (Lai & Zhao, 2022). Furthermore, Chapelle (2021) highlights the importance of MALL in reducing learning barriers and supporting diverse learning styles, catering to visual, auditory, and kinesthetic learners through multimedia integration.

Despite these advantages, studies acknowledge several challenges. For example,

technological limitations such as unreliable internet connections and inadequate device capabilities can hinder learning efficiency (Stockwell, 2018). Additionally, learner discipline is a concern, as mobile devices can become a source of distraction (Reinders, 2021). Another challenge is that MALL may not fully support deep conceptual learning, especially for complex grammar structures or cultural nuances that require more structured instruction (Chapelle, 2021). Nevertheless, various studies suggest that strategic integration of MALL into the curriculum, combined with teacher training, can mitigate these limitations (Lai & Zhao, 2022).

Based on these findings, this study affirms that MALL serves as a bridge between theoretical learning and real-world language application, providing university students with opportunities to practice language in authentic contexts, which is critical for career readiness in a globalized workforce. However, to fully maximize the benefits of MALL, educational institutions must develop structured implementation strategies. This includes selecting the right digital tools that align with learning objectives, designing interactive activities, and ensuring platforms are user-friendly and accessible to all students.

Furthermore, teacher training plays a crucial role in optimizing MALL's effectiveness. Educators must be equipped with digital literacy skills to integrate mobile-assisted learning seamlessly into their teaching methodologies. As suggested by Chapelle (2021), professional development programs

should focus on pedagogical strategies, effective lesson planning with technology, and troubleshooting digital issues. This will ensure that teachers can create meaningful learning experiences beyond traditional methods.

Additionally, while MALL encourages independent learning, institutions should balance self-paced study with collaborative learning opportunities. Studies by Lai and Zhao (2022) and Reinders (2021) indicate that virtual discussion forums, peer feedback activities, and online group projects enhance student engagement and communication skills. These collaborative elements should be emphasized to foster teamwork and intercultural communication, preparing students for global interactions.

The broader implications of integrating MALL extend beyond language acquisition—it prepares students for the evolving digital economy. Industries increasingly seek professionals proficient in both communication and technology, making digital literacy a crucial competency. Moreover, MALL enhances global competitiveness by enabling students to engage with peers from diverse linguistic and cultural backgrounds, promoting a socially connected and inclusive learning environment.

Future Research Directions

While existing research provides valuable insights into MALL's benefits and challenges, further studies should explore its long-term impact on higher education. Future research could investigate how AI and AR technologies

enhance MALL's capabilities, offering more personalized learning experiences and real-time feedback mechanisms. Additionally, more empirical studies are needed to assess the scalability of MALL in various educational settings, particularly in low-resource environments where access to mobile technology remains limited.

Conclusions

The integration of Mobile-assisted Language Learning (MALL) in higher education marks a new frontier in digital education, offering flexible, accessible, and student-centered learning experiences. However, as MALL continues to evolve, its long-term sustainability must be carefully monitored and evaluated to ensure its effectiveness in fostering meaningful language acquisition and digital literacy. Educational institutions should conduct systematic assessments of MALL's impact on student learning outcomes, engagement levels, and skill development to refine and optimize its implementation. Future innovations, such as AI-driven language support and immersive augmented reality environments, could further enhance MALL's capacity to provide authentic, personalized learning experiences. Ultimately, embracing a data-driven approach to evaluating MALL's sustainability will enable educators to continuously improve and adapt this transformative learning model, ensuring that it meets the evolving needs of students in a rapidly changing global landscape.

Recommendations

Based on the findings of this study, the following recommendations are proposed to enhance the integration of Mobile-assisted Language Learning (MALL) into higher education curricula effectively:

1. Strategic Integration of MALL Tools into Curricula

Institutions should adopt a systematic framework for incorporating MALL into language courses. This includes selecting tools aligned with specific learning outcomes, designing activities that balance independent practice and collaborative engagement, and ensuring accessibility across diverse student demographics. Additionally, universities should consider pilot-testing mobile applications and gathering student feedback to refine their integration strategies. This approach ensures that MALL not only complements existing teaching methods but also addresses the diverse needs of learners in a scalable manner.

2. Comprehensive Teacher Training and Support

To optimize the potential of MALL, teacher training programs must focus on equipping educators with both technical proficiency and pedagogical strategies for digital tools. These programs should emphasize the use of analytics within MALL platforms to monitor student sustainability, adapt teaching approaches, and provide personalized feedback. Furthermore, institutions should establish continuous professional development workshops and support networks, enabling educators to share best practices, address challenges, and innovate in real time. Such efforts will ensure that educators are not only confident in using MALL but are also able to inspire and engage students effectively.

These recommendations aim to foster a robust learning environment where MALL catalyzes improved language proficiency, lifelong learning, and preparation for dynamic, global career landscapes.

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