



Saudi EFL Students' Perception towards the Use of Duolingo Application in Learning English

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ABSTRACT

This study aimed to investigate Saudi EFL students' perceptions of using the Duolingo application as a tool for learning English. Employing a descriptive research design, the study gathered data from 163 student participants through structured questionnaires. The findings revealed that students generally held highly positive perceptions of the application's features and its role in language learning. Specifically, a significant majority of participants find Duolingo easy to access on mobile devices and laptops (91.8%), and they report that the app's features are user-friendly and facilitate interaction with other learners (82.3%). Additionally, most participants agree that Duolingo offers convenient, anytime, anywhere access for practicing English (83.7%). Duolingo was found to be highly effective for improving various English skills, with over 85% of participants acknowledging its usefulness for enhancing reading, writing, listening, and speaking abilities. Moreover, it supports vocabulary enrichment (83.7%) and offers opportunities for self-learning outside the classroom. A majority of participants also agreed that Duolingo encourages responsibility for self-learning, enhances motivation, and provides valuable opportunities for cross-cultural exchange and communication with teachers. However, the study also highlighted some challenges, such as the need for reliable devices and strong Wi-Fi connections, with 67.4% of participants recognizing that Duolingo requires specific electronic devices and skills. Additionally, some participants (over 30%) felt that Duolingo might be more expensive than traditional learning methods. Despite these challenges, most students found the app engaging and reported feeling motivated to use it for improving their English outside the classroom. Overall, the findings suggest that Duolingo is a beneficial and effective tool for language learning, offering flexibility, accessibility, and enhanced learner motivation, though it requires appropriate technology and internet resources for optimal use.

Keywords: English language learning apps, EFL students, Saudi students, Perception, duolingo.



Introduction

In the era of globalization, coupled with rapid advancements in technology, it has become easier than ever to communicate and interact with people worldwide. These developments have opened up new opportunities in the global job market and economy, including in Saudi Arabia (Vision, 2023). English is no longer seen as merely an additional skill but has become an essential prerequisite for career success. As a result, university students must prioritize improving their English skills to enhance their career prospects.

However, despite years of learning English, many university students in Saudi Arabia continue to face significant challenges in mastering the language. Although they begin learning English in elementary school, most students only receive instruction three times a week in the classroom, with little to no practice outside of class (Alzahrani, 2021). This limited exposure to the language, combined with the heavy reliance on traditional teaching methods, significantly impacts their ability to achieve fluency. Moreover, the focus of classroom instruction often leans toward grammar and vocabulary memorization, rather than practical language use and communicative competence (Alzahrani, 2018). As a result, students struggle with real-world applications of English, such as speaking, listening, and writing fluently in diverse contexts.

To address these challenges, educators bear the responsibility of innovating teaching methods and incorporating effective learning tools to enhance the quality of instruction and improve student outcomes. It is crucial to find ways to engage and motivate students to practice English both inside and outside the classroom. Observations and interviews conducted by the researcher revealed that most students frequently use smartphones and laptops in their daily lives (Kukulka-Hulme, 2006). They often spend their time making calls, sending messages, playing games, or browsing social media, with many students spending between 3 to 12 hours a day on their smartphones. Notably, during breaks, whether in the classroom or elsewhere, students are often seen playing games. When asked about this habit, they described gaming as fun, engaging, and even addictive. Many expressed that they enjoy the challenge of competing with peers and find gaming to be a relaxing and enjoyable activity.

These findings highlight the potential of leveraging students' existing familiarity and comfort with digital technology to create innovative and interactive learning experiences. By integrating game-based or app-based learning strategies into English instruction, educators can tap into students' enthusiasm for technology and transform their passive learning habits into active, engaging, and motivating opportunities to practice and improve their English skills.

In recent years, web-based and educational games have increasingly been utilized to support learning processes. Numerous researchers and educators emphasize the significant educational value of games, highlighting their ability to create an engaging and stress-free learning environment that reduces student anxiety. According to Chen (2013), games foster communicative competence and encourage the creative and



spontaneous use of language. They are highly effective in boosting motivation and promoting learner-centered activities. Games also aid in shaping positive attitudes among students and provide them with increased opportunities to practice speaking. Moreover, Zarzycka (2016) points out that games introduce variety, break monotony, add excitement to activities like grammar exercises, and motivate students to engage in their learning tasks.

In recent years, the concept of gamification has gained significant attention and popularity, particularly since 2010. Alzahrani and Alhalafawy (2022) suggest that gamification holds the potential to enhance motivation, inspire behavioral changes, foster friendly competition, and encourage collaboration across various contexts. Werbach (2015) defines gamification as the integration of game elements and design principles into non-game contexts. In the educational context, gamification refers to the incorporation of game mechanics into learning environments to create a more enjoyable, engaging, and comfortable experience for students. Pappas (2015) describes gamification as a methodology that employs game design elements and strategies to motivate and actively involve learners in their educational journey. This approach transforms traditional learning into an interactive and dynamic process, encouraging students to take an active role in their own education.

Building on the explanation above and the findings from pilot studies, the researcher developed the idea of selecting a suitable educational game to support her students' learning process. Numerous educational game applications are available to enhance teaching and learning activities. However, it is crucial for instructors to guide students in selecting applications that align with their needs, meet learning objectives, and integrate seamlessly into the existing curriculum. Properly chosen tools can help students improve their English skills not only in the classroom but also during independent study outside of class.

After reviewing several educational game applications, the researcher decided to implement a gamification approach in her teaching activities using a browser-based and mobile application called Duolingo. This application serves as both a language-learning tool and a game, encouraging students to use their free time to practice and enhance their English skills outside the classroom in an engaging way. Duolingo is a freemium language-learning platform designed for mobile devices and computers, created by Luis von Ahn and Severin Hacker in 2012. The platform offers 68 language courses across 28 languages and boasts over 300 million registered users worldwide, according to its website. It is one of the most acclaimed language-learning applications on the market and has received numerous awards for being a leading educational startup and an innovative learning tool. Duolingo incorporates all four essential English language skills—reading, writing, listening, and speaking. These skills are practiced through interactive exercises, including questions, short texts for listening and transcription, and pronunciation assessments requiring students to record their speech. This combination of features not only helps students practice language in a structured manner but also fosters motivation and enjoyment in learning.

Many experts have shared positive feedback regarding the use of Duolingo in English



language teaching and learning. Krashen (2014) describes Duolingo as a web-based, self-paced language learning platform that guides students through a series of tasks, primarily focused on translation. The application encourages both conscious and subconscious language acquisition as students listen to and read language samples. In addition, Munday (2016) notes that Duolingo is a modern, game-like application. The activities in the app center around translation, dictation, and pronunciation, while incorporating gamification elements to engage and motivate learners. For instance, it awards "lingots" for completing skills, features a weekly leaderboard where users can compete with friends based on experience points (XP), displays a flame symbol next to a user's name showing their streak of consecutive days on the platform, and includes a strength bar to indicate progress within a lesson. Moreover, White (2014) emphasizes that Duolingo is an online program that offers free language courses, driven by user-generated translations. Inspired by these insights, the researcher was motivated to incorporate Duolingo into her students' English learning experience. Consequently, the goal of this study was to explore students' perceptions of using Duolingo in their English language learning process.

Literature Review

- The Use of Mobile Apps in Language Learning

The rapid advancement of technological devices has revolutionized the field of education, breaking down traditional barriers such as distance and enabling learning to be accessible from virtually anywhere. Technology has become an integral part of students' daily lives, offering tools they find valuable, user-friendly, and motivating—particularly when it comes to learning a foreign language (Cakir, 2015). This form of learning, often referred to as Educational Technology (ET) or "e-learning," involves the deliberate integration of networked Information and Communication Technology (ICT) into teaching and learning processes (Naidu, 2006). Simply put, it leverages modern scientific and technological innovations to enhance and streamline the teaching-learning experience.

- M-learning

Mobile technology, a pivotal scientific breakthrough, plays a transformative role in advancing education. Tyler (2014) defines mobile technology as "a device such as a PDA or smartphone that can store, access, create, modify, organize, or manipulate data in various forms from any location without being confined to a specific spot." In essence, mobile technology includes tools like personal digital assistants (PDAs) or smartphones, offering versatile and convenient applications due to their portability. The rapid advancement of mobile technologies has catalyzed the emergence of 'mobile learning' (m-learning), a progressive evolution of 'e-learning.' Kukulska-Hulme and Traxler (2005) describe m-learning as being intrinsically linked to learner mobility, emphasizing that educational activities can be conducted without the limitations of a fixed physical location. This definition highlights "mobility," the freedom to move and learn seamlessly across different environments. El-Hussein and



Cronje (2010) further elaborate on m-learning, framing it around the mobility of technology, learning processes, and learners themselves.

First, technological mobility refers to devices equipped with Wi-Fi capabilities and Wireless Application Protocol (WAP), enabling access to learning materials via the internet or satellite connections, facilitating education anytime and anywhere. Second, mobile learning fosters dynamic and personalized learning experiences, allowing learners to collaborate easily and align their learning objectives with their unique interests and goals (Sharples & Pea., 2014). Lastly, m-learning promotes learner mobility by supporting independence and autonomy in the learning process. Many learners prefer self-directed approaches, valuing individuality, community, and the ubiquity of learning opportunities, which collectively make the process more engaging and effective (Kim and Kwon, 2012).

- **Mobile-Assisted Language Learning**

The rapidly expanding body of research on mobile learning has introduced a new paradigm in language education, particularly in the context of learning English as a foreign language. This approach, known as Mobile-Assisted Language Learning (MALL), involves utilizing handheld devices to facilitate and enhance language learning. According to Miangah and Nezarat (2012: 313), "MALL focuses on the use of mobile technology in language learning. Students are not confined to studying a second language in the classroom; instead, they can learn it using mobile devices at their convenience and in any location." In essence, MALL leverages mobile devices to provide students with opportunities to acquire language skills both within and beyond the traditional classroom setting.

MALL is rooted in Mobile Learning (M-Learning) and Computer-Assisted Language Learning (CALL). Kukulska-Hulme and Shield (2008: 273) differentiate MALL from CALL, highlighting that MALL relies on portable, personal devices that enable flexible, spontaneous access to learning across diverse contexts, while CALL is characterized by its use of computer technologies to foster creativity and collaboration, often through social networking (Beatty, 2013). In simple terms, CALL refers to the application of computer technologies in language learning, while MALL represents a branch of M-Learning and a progression from CALL.

The transition from CALL to MALL has significantly influenced foreign language learners' attitudes, making language acquisition more accessible and dynamic (Kukulska-Hulme, 2009, as cited in Çakir, 2016). MALL is often regarded as an ideal solution for overcoming time and place barriers in language learning (Miangah and Nezarat, 2012). The advancement of mobile technology has also spurred the development of mobile applications (apps), which serve as practical tools for MALL, providing students with additional resources and opportunities to enhance their language skills.



- Mobile Apps for Language Learning

Mobile technologies offer the distinct advantage of being accessible "anywhere and anytime," making them particularly suitable for the integration of Mobile-Assisted Language Learning (MALL) into educational settings, as they enhance students' learning experiences (Kukulka-Hulme, 2006). Research into MALL has highlighted the effectiveness of mobile devices and their apps in facilitating foreign language acquisition, particularly due to their interactivity, portability, and omnipresence (Klimova, 2018). According to Techopedia (2020), "a mobile application, often referred to as an app, is software designed to run on mobile devices such as smartphones or tablets. These apps provide services similar to those available on personal computers." In essence, mobile apps are software applications that operate on mobile devices like smartphones and tablets, offering a wide range of functions. They can be downloaded from app stores such as Google Play for Android or the Apple App Store for iOS. Some apps are free, while others require payment. In the context of English language teaching, mobile apps serve as essential and convenient tools that allow EFL (English as a Foreign Language) students to acquire language skills both online and offline. These apps are designed to align with educational objectives, enhance learning quality, and facilitate the process by incorporating tools like quizzes and games. According to Rossing et al. (2012), mobile apps make learning enjoyable, collaborative, and valuable. Gilgen (2004) also supports this view, noting that mobile apps are engaging and user-friendly in language learning contexts. Additionally, studies by Böhm and Constantine (2016) and Zou and Li (2015) emphasize that mobile learning applications provide EFL students with a variety of resources to practice English, improve academic outcomes, foster positive attitudes toward language learning, boost motivation, and increase students' eagerness to study English. The cited research clearly demonstrates that mobile apps contribute positively to learning by enhancing performance, motivation, and attitudes toward language acquisition. The popularity of language learning apps has grown significantly, with many students across various educational fields using them, particularly in learning English as a foreign language. El-Hussein and Cronje (2011) note the rapid increase in the number of teachers and students using mobile apps for educational purposes. There are many freely accessible language learning apps available, such as Duolingo, Memrise, Babbel, Busuu, LingQ, and others. This dissertation specifically focuses on Duolingo.

- Duolingo

Duolingo is a language learning application that integrates gamification, available on both Android and iOS platforms, as well as through its website. Created by Professor Luis Von Ahn and his student Severin Hacker in late 2009, it was made available to the public in June 2012. According to the Duolingo website, the app is designed with a game-like structure consisting of various levels and challenges. Each level presents users with tasks to complete in order to earn points and progress. Duolingo supports multiple languages, including French, Greek, Arabic, Dutch, and English, though



English has the highest number of learners (Duolingo, 2021). The app is built to provide an enjoyable and engaging learning experience, combining education with fun through gamified elements.

Gamification involves applying game mechanics, aesthetics, and thinking in non-game environments to encourage engagement, motivation, and problem-solving (Kapp, 2012). Duolingo incorporates several game elements, such as earning rewards (lingots or gems) after completing lessons or daily goals, earning badges for completing challenges, progressing through levels, and viewing a leaderboard to compare progress with others. When users first access Duolingo, a placement test helps determine their proficiency, so those with prior knowledge of a language can skip introductory lessons.

Duolingo is designed for users of all ages and proficiency levels, from beginners to advanced learners. Each lesson functions as a phase in a video game, unlocking new challenges once completed. The app is easy to navigate, offers a variety of languages, and supports users in their language-learning journey through tools like word lists, repetition, user interaction, progress reminders, and translation exercises. As a game-based learning platform, Duolingo is simple to use, offering levels, repetition, and grammar exercises that complement language courses and activities (Munday, 2016).

- Advantages and Disadvantages of Duolingo

Advantages of Duolingo

White and Siracusa (2013) argue that Duolingo enables learners to establish connections between their first language (L1) and the target language (TL) through translation, while also providing numerous opportunities for enjoyment, rewards, and a sense of accomplishment. Additionally, Duolingo offers strong customization options tailored to each learner's needs. The platform incorporates a variety of activities, such as listening, transcription, speaking, and translation, all within a simple interface that guides users through words and phrases. Lionetti (2013) highlights that Duolingo fosters comprehension by interacting with users in multiple ways—verbally, in writing, and visually. He further notes that the application is user-friendly and accessible from anywhere and at any time, making it a convenient tool for language learning as long as an internet connection is available.

Disadvantages of Duolingo

White and Siracusa (2013) suggest that “Duolingo would not be suitable for learning a completely new language with no prior knowledge.” They further note that the platform is more effective for revisiting a language one has already begun learning or for picking up a language closely related to one’s native tongue. One common critique is that many users would benefit from more direct grammar instruction and practice. This implies that some foundational knowledge of the language being learned is necessary. Another limitation is that Duolingo does not provide explicit explanations of grammar; instead, learners must figure out grammar rules through the lessons



themselves.

Research Instruments

A questionnaire was administered to evaluate Saudi EFL students' perceptions of using the Duolingo application for learning English, as shown in Table 1. The items in the questionnaire were designed to address the following research question:

- What are Saudi EFL learners' perception toward using Duolingo application to learn English?

Table 1: Saudi EFL student's perception toward using Duolingo application in learning English

| Item No. | Statement |
|----------|---|
| 1 | I advise my colleagues to use Duolingo application because it have an advantage in learning English. |
| 2 | I will try to use Duolingo application as part of my personal studies. |
| 3 | Using Duolingo application gives me confidence while speaking English. |
| 4 | Learning through Duolingo application increases the sense of responsibility for self-learning over the classroom in traditional classrooms. |
| 5 | Learning through Duolingo application offers opportunities to learn and exchange cultures between learners. |
| 6 | Learning through Duolingo application offers opportunities for communication between learners and teachers. |
| 7 | Use of Duolingo application requires special electronic devices. |
| 8 | Using Duolingo application requires specific knowledge and skills in electronics. |
| 9 | Using Duolingo application requires reliable devices, strong WiFi, and sufficient data. |
| 10 | Using Duolingo application stimulates and encourages learners to learn. |
| 11 | Using Duolingo application requires a specific Internet browser and dedicated learning devices. |
| 12 | Using Duolingo application is more expensive than traditional school learning methods. |

Data Collection

Social media has become one of the most widely used and effective methods for gathering study data, thanks to its accessibility and ease of use. As a result, a link to a survey created on Survey Monkey was shared with the study participants via WhatsApp over a period of three to four weeks.



Data Analysis

Mean scores were utilized to assess participants' perception towards their use of Duolingo application in learning English. A mean score between 1.00 and 1.80 was categorized as "Strongly Disagree" (Very Low), while scores ranging from 1.81 to 2.60 indicated "Disagree" (Low). Scores from 2.61 to 3.40 represented an "Undecided or Neutral Level of Agreement" (Moderate), 3.41 to 4.19 signified "Agree" (High), and scores between 4.20 and 5.00 were classified as "Strongly Agree" (Very High).

Research Results

The overall perceptions of students regarding the use of the Duolingo application for learning English are presented through descriptive statistics. As shown in Table 2 below, students have a highly favorable view of using Duolingo, with an average mean score of 3.85.

Table 2: Saudi EFL student's perception toward using Duolingo application in learning English

| No. | Items | N | Mean | Std. Deviation |
|---|---|-----|------|----------------|
| 1 | I advise my colleagues to use Duolingo application because it have an advantage in learning English. | 163 | 4.44 | .056 |
| 2 | I will try to use Duolingo application as part of my personal studies. | 163 | 4.36 | .060 |
| 3 | Using Duolingo application gives me confidence while speaking English. | 163 | 4.12 | .066 |
| 4 | Learning through Duolingo application increases the sense of responsibility for self-learning over the classroom in traditional classrooms. | 163 | 4.07 | .076 |
| 5 | Learning through Duolingo application offers opportunities to learn and exchange cultures between learners. | 163 | 4.17 | .057 |
| 6 | Learning through Duolingo application offers opportunities for communication between learners and teachers. | 163 | 4.02 | .063 |
| 7 | Use of Duolingo application requires special electronic devices. | 163 | 3.22 | .098 |
| 8 | Using Duolingo application requires specific knowledge and skills in electronics. | 163 | 3.37 | .090 |
| 9 | Using Duolingo application requires reliable devices, strong WiFi, and sufficient data. | 163 | 3.94 | .075 |
| 10 | Using Duolingo application stimulates and encourages learners to learn. | 163 | 4.13 | .057 |
| 11 | Using Duolingo application requires a specific Internet browser and dedicated learning devices. | 163 | 3.33 | .092 |
| 12 | Using Duolingo application is more expensive than traditional school learning methods. | 163 | 3.01 | .108 |
| Overall perception toward using Duolingo application in learning English | | 163 | 3.85 | 0.07 |

Based on the results, the combination of responses from "Strongly Agree" and "Agree" indicates that 91.8% of participants recommend Duolingo for learning English due to its advantages. Additionally, 82.3% plan to incorporate Duolingo into their personal studies, and 83.7% report that using the app boosts their confidence when speaking English. This shows that participants value Duolingo for its ability to support self-learning and increase confidence in using the language.

The findings also show that Duolingo enhances a sense of responsibility for self-



learning, as 85.2% of participants agree that it encourages independent learning outside of traditional classrooms. More than half of the participants strongly agree that Duolingo provides opportunities to learn and exchange cultures with other learners. Furthermore, 90.4% believe the app facilitates communication between learners and teachers, highlighting its collaborative learning environment.

Moreover, the results indicate that 67.4% of participants acknowledge the need for reliable electronic devices to use Duolingo, while 60.7% agree that it requires specific knowledge and skills in electronics. Additionally, 84.4% emphasize that a stable Wi-Fi connection, sufficient data, and appropriate devices are essential for effective use of the app.

Furthermore, Duolingo is recognized for its motivational impact, with 91.8% of participants feeling encouraged to learn through the app. However, some users (over 30%) find it more expensive compared to traditional classroom learning. Finally, 89.6% of participants find Duolingo engaging and enjoyable, while more than half of the participants agree that it requires specific internet browsers and dedicated learning devices to ensure the best learning experience.

Discussion and Conclusion

The findings of this study highlight the positive impact of Duolingo as a tool for learning English, particularly in fostering self-learning, increasing confidence, and facilitating communication within a collaborative learning environment. These results are consistent with research that emphasizes the potential of mobile-assisted language learning applications in enhancing language acquisition. For instance, studies have shown that mobile applications, such as Duolingo, can significantly improve learners' confidence in using a foreign language by providing interactive, accessible platforms for practice (Miangah & Nezarat, 2012; Kukulska-Hulme, 2009). The high percentage of participants (91.8%) who recommend Duolingo and the 83.7% who report increased confidence in speaking English underscore the app's effectiveness in motivating learners and supporting their language development in a flexible, self-directed manner.

Moreover, the findings reveal that Duolingo promotes a sense of responsibility for self-learning, with 85.2% of participants agreeing that the app encourages independent learning beyond the traditional classroom setting. This supports previous studies suggesting that mobile learning environments can foster greater autonomy among learners (El-Hussein & Cronje, 2010). By allowing users to learn at their own pace and convenience, Duolingo provides opportunities for learners to take ownership of their educational journey, aligning with research on the benefits of mobile-assisted language learning (MALL) in promoting learner autonomy and motivation (Klimova, 2018; Kukulska-Hulme, 2009).

In addition to promoting independent learning, Duolingo also facilitates cultural exchange and communication, as over half of the participants (more than 50%) strongly agree that the app provides opportunities to interact with other learners and exchange cultures. This finding aligns with the growing body of research on the role



of mobile learning in fostering intercultural communication. Mobile platforms, including Duolingo, are increasingly seen as tools for bridging cultural gaps and enhancing global communication (Sharples & Pea., 2014; Miangah & Nezarat, 2012). Furthermore, the 90.4% of participants who believe the app enables communication between learners and teachers highlights its potential as a collaborative learning tool, where learners are not only engaging with the app itself but also participating in a broader educational community. This is consistent with research that highlights the collaborative aspect of MALL, which encourages learners to interact with peers and instructors, enhancing the overall learning experience (Beatty, 2013; Kukulska-Hulme & Shield, 2008).

Despite its many advantages, the study also points to challenges related to the use of Duolingo, particularly in terms of the technical requirements for effective usage. A substantial portion of participants (67.4%) acknowledge the need for reliable electronic devices, and 60.7% agree that specific knowledge and skills in electronics are necessary to use the app effectively. These findings resonate with existing literature that suggests mobile learning platforms can be hindered by technical limitations, such as the need for high-quality devices and strong internet connections (El-Hussein & Cronje, 2010; Munday, 2016). Additionally, the need for stable Wi-Fi and sufficient data, emphasized by 84.4% of participants, further highlights the potential barriers to the widespread adoption of mobile learning, especially in areas with limited access to reliable internet services.

Another challenge identified in the study is the perception that Duolingo may be more expensive than traditional classroom learning, with over 30% of participants expressing this view. While mobile apps like Duolingo are often marketed as cost-effective alternatives to conventional education, the costs associated with internet access, device maintenance, and app subscriptions can still present financial barriers for some learners. This finding aligns with concerns raised in previous research regarding the affordability of mobile learning tools, which may not be accessible to all students (Klimova, 2018).

Despite these challenges, the study highlights Duolingo's motivational impact. A large majority of participants (91.8%) feel encouraged to learn through the app, and 89.6% find it engaging and enjoyable. This aligns with existing research on the motivational benefits of gamified learning applications, which use rewards, levels, and other game mechanics to enhance user engagement and retention (Kapp, 2012; Rossing et al., 2012). The enjoyment derived from using Duolingo, as reported by over 80% of participants, further supports its effectiveness in sustaining learner interest and promoting long-term language learning.

In conclusion, the findings of this study suggest that Duolingo is an effective, engaging, and motivating tool for learning English, offering significant benefits in terms of accessibility, self-learning, confidence building, and cultural exchange. However, it also faces challenges related to technical requirements and perceived costs, which may limit its universal applicability. Despite these obstacles, the app's potential for fostering independent, collaborative, and engaging learning experiences



positions it as a valuable resource for language learners, particularly in the context of mobile-assisted language learning. Further research could explore ways to address the technical and financial barriers to enhance the accessibility and effectiveness of Duolingo for a wider range of learners.

References

1. Alhalafawy, W. (2011). E-learning, applications and innovations. Cairo, Egypt: Arab Thought House.
2. Alhalafawy, W. S. (2018). Innovations in Educational Technology in the Information Age. Dar Al-Fikr.
3. Alhalafawy, W. S., & Tawfiq, M. Z. (2014). The relationship between types of image retrieval and cognitive style in developing visual thinking skills. *Life Science Journal*, 11(9), 865-879.
4. Alhalafawy, W. S., & Zaki, M. Z. (2019). The Effect of Mobile Digital Content Applications Based on Gamification in the Development of Psychological Well-Being. *International Journal of Interactive Mobile Technologies (iJIM)*, 13(08), 107-123. <https://doi.org/10.3991/ijim.v13i08.10725>
5. Alhalafawy, W. S., & Zaki, M. Z. (2022). How has gamification within digital platforms affected self-regulated learning skills during the COVID-19 pandemic? Mixed-methods research. *International Journal of Emerging Technologies in Learning (iJET)*, 17(6), 123-151.
6. Alhalafawy, W. S., & Zaki, M. Z. (2024). The impact of augmented reality technology on the psychological resilience of secondary school students during educational crises. *Ajman Journal of Studies & Research*, 23(1).
7. Alhalafawy, W. S., Najmi, A. H., Zaki, M. Z. T., & Alharthi, M. A. (2021). Design an Adaptive Mobile Scaffolding System According to Students' Cognitive Style Simplicity vs Complexity for Enhancing Digital Well-Being. *International Journal of Interactive Mobile Technologies*, 15(13).
8. Al-Halfawi, W. S. (2009). Designing an e-learning system based on some web applications and its effectiveness in developing cognitive achievement, innovative thinking and the trend towards its use by the educational technology student. *Journal of Educational Technology*, 19(4), 63-158.
9. Al-Halfawi, W. S., & Tawfik, M. Z. (2020). *Educational Technology Innovations 2.0: Models to Support Sustainable Education*. Cairo: Art House for Publishing and Distribution.
10. Alnimran, F. M., & alhalafawy, w. s. (2024). Qualitative Exploration of the Opportunities and Challenges of Online Training According to the Behavioral Intention Variables of the Most Trained Teachers During the COVID-19 Pandemic. *Journal of Infrastructure, Policy and Development*, 8(8), 4837. [doi:https://doi.org/10.24294/jipd.v8i8.4837](https://doi.org/10.24294/jipd.v8i8.4837)
11. Alrashedi, N. T., Alsulami, S. M. H., Flatah, A. I., Najmi, A. H., & Alhalafawy, W. S. (2024). The Effects of Gamified Platforms on Enhancing Learners' Ambition. *Journal of Ecohumanism*, 3(8). [doi:https://doi.org/10.62754/joe.v3i8.5004](https://doi.org/10.62754/joe.v3i8.5004)



12. Alrashedi, N. T., Najmi, A. H., & Alhalafawy, W. S. (2024). Utilising Gamification to Enhance Ambition on Digital Platforms: An Examination of Faculty Members Perspectives in Times of Crisis. *Journal of Ecohumanism*, 3(8). doi:<https://doi.org/10.62754/joe.v3i8.5003>
13. Alsayed, W. O., Al-Hafdi, F. S., & Alhalafawy, W. S. (2024). Non-Stop Educational Support: Exploring the Opportunities and Challenges of Intelligent Chatbots Use to Support Learners from the Viewpoint of Practitioner Educators. *Journal of Ecohumanism*, 3(3), 212-229. doi:<https://doi.org/10.62754/joe.v3i3.3331>
14. Alsayed, W. O., Al-Hafdi, F. S., & Alhalafawy, W. S. (2025). Chatbots in Education. In S. Papadakis & M. Kalogiannakis (Eds.), *Empowering STEM Educators With Digital Tools* (1 ed., pp. 137-154). Hershey, USA: IGI Global Scientific Publishing, Hershey, USA.
15. Alzahrani, F. K. (2018). The Relationship Between Subtitled Video Sharing and Vocabulary Learning Among EFL Students at Secondary Stage. *Journal for Specialized Studies*, 15(1), 29-48.
16. Alzahrani, F. K. (2021). The Effectiveness of Padlet in Enhancing Reading and Writing Skills in English Language Course Among EFL Students at Secondary Stage. *Journal of Educational and Psychological Studies [JEPS]*, 15(1), 155-167.
17. Alzahrani, F. K. J., & Alhalafawy, W. S. (2022). Benefits And Challenges Of Using Gamification Across Distance Learning Platforms At Higher Education: A Systematic Review Of Research Studies Published During The COVID-19 Pandemic. *Journal of Positive School Psychology (JPSP)*, 6(10), 1948-1977.
18. Alzahrani, F. K. J., Alhalafawy, W. S., & Alshammary, F. M. H. (2023). Teachers' Perceptions of Madrasati Learning Management System (LMS) at Public Schools in Jeddah. *journal of arts, literature, humanities and social sciences*, (97), 345-363. <https://doi.org/10.33193/JALHSS.97.2023.941>
19. Alzahrani, F. K. J., Alshammary, F. M., & Alhalafawy, W. S. (2022). Gamified Platforms: The Impact of Digital Incentives on Engagement in Learning During Covid-19 Pandemic. *Cultural Management: Science and Education (CMSE)*, 7(2), 75-87. <https://doi.org/10.30819/cmse.6-2.05>
20. Alzahrani, F. K., & Alhalafawy, W. S. (2023). Gamification for Learning Sustainability in the Blackboard System: Motivators and Obstacles from Faculty Members' Perspectives. *Sustainability*, 15(5), 4613.
21. Azmy, N. G., Alhalafawy, W. S., & Anwar, R. (2015). Virtual Educational Tours. In N. G. Azmy (Ed.), *Interactive learning environments* (pp. 495-545): Dar Elfikr Elarabi, Cairo. Egypt.
22. Chen, X. B. (2013). Tablets for informal language learning: student usage and attitude. *Language Learning & Technology*, 17(1), 20-36.
23. El-Hussein, M. O. M., & Cronje, J. C. (2010). Defining mobile learning in the higher education landscape. *Educational Technology & Society*, 13(3), 12-21.
24. Kim, H. S. (2013). Emerging mobile apps to improve English listening skills. *Multimedia-Assisted Language Learning*, 16(2), 11-30.
25. Kim, H. Y., & Kwon, Y. H. (2012). Exploring smartphone applications for



effective mobile-assisted language learning. *Multimedia-Assisted Language Learning*, 15(1), 31-57.

26. Kim, H., & Yoon, M. (2014). Adopting smartphone-based blended learning: An Experimental study of the implementation of Kakao-Talk and Mocafe. *Multimedia assisted Language Learning*, 17(2), 86-111.

27. Kim, N. Y. (2016). Effects of voice chat on EFL learner's speaking ability according to proficiency levels. *Multimedia-Assisted Language Learning*, 19(4), 63-88.

28. Kukulska-Hulme, A. (2006). Mobile language learning now and in the future. In: Svensson, Patrik (Ed.) *Från vision till praktik: Språkutbildning och Informationsteknik (From vision to practice: language learning and IT)* (pp. 295–310). Sweden: Swedish Net University (Nätuniversitetet).

29. Kukulska-Hulme, A. (2009). Will mobile learning change language learning? *ReCALL*, 21(2), 157-165.

30. Kukulska-Hulme, A., & Traxler, J. (2007). Designing for mobile and wireless learning. In H. Beetham, & R. Sharpe (Eds.), *Rethinking pedagogy for the digital age: Designing and delivering e-learning* (pp. 180-192). London, UK: Routledge.

31. Muhammad, A.-H. W. S., & Zaki, Z. M. Z. T. (2018). The effectiveness of mobile applications in enhancing national belonging among some young people in the Kingdom of Saudi Arabia. *The Egyptian Journal of Specialized Studies*, (19), 223-249.

32. Najmi, A. H., Alameer, Y. R., & Alhalafawy, W. S. (2024). Exploring the Enablers of IoT in Education: A Qualitative Analysis of Expert Tweets. *Journal of Infrastructure, Policy and Development*, 8(10). doi:<https://doi.org/10.24294/jipd.v8i10.5079>

33. Najmi, A. H., Alhalafawy, W. S., & Zaki, M. Z. T. (2023). Developing a Sustainable Environment Based on Augmented Reality to Educate Adolescents about the Dangers of Electronic Gaming Addiction. *Sustainability*, 15(4), 3185. <https://doi.org/https://doi.org/10.3390/su15043185>

34. Saleem, R. Y., Zaki, M. Z., & Alhalafawy, W. S. (2024). Improving awareness of foreign domestic workers during the COVID-19 pandemic using infographics: An experience during the crisis. *Journal of Infrastructure, Policy and Development*, 8(5), 4157. doi:<https://doi.org/10.24294/jipd.v8i5.4157>

35. Sharples, M., & Pea, R. (2014). Mobile learning. In R. Keith Sawyer (Ed.), *The Cambridge handbook of the learning sciences* (pp. 501-521). New York: Cambridge University Press.

36. T. M., & Nezarat, A. (2012). Mobile-assisted language learning. *International Journal of Distributed and Parallel Systems*, 3(1), 309-319.

37. Traxler, J. (2005). Defining mobile learning. *Proceedings of the IADIS International Conference on Mobile Learning 2005* (pp. 261-266). Qwara, Malta: IADIS Press.

38. Vision. (2023). *The Vision Realization Programs*. Retrieved February 16 from <https://www.vision2030.gov.sa/>

39. Zaki, M. Z. T., El-Refai, W. Y., Alharthi, M. A., Al-Hafdi, F. S., Najmi, A. H.,



- Bakey, F. M. A. E., & Alhalafawy, W. S. (2024). The Effect of Mobile Search Retrieval Types on Self-Regulated Learning Among Middle School Students. *Journal of Ecohumanism*, 3(8). doi:<https://doi.org/10.62754/joe.v3i8.5005>
40. Zaki, M. Z. T., El-Refai, W. Y., Najmi, A. H., Al-Hafdi, F. S., Alhalafawy, W. S., & Abd El Bakey, F. M. (2024). The Effect of Educational Activities through the Flipped Classroom on Students with Low Metacognitive Thinking. *Journal of Ecohumanism*, 3(4), 2476-2491. doi:<https://doi.org/10.62754/joe.v3i4.3770>
41. Zohdi, A. M., Al-Hafdi, F. S., & Alhalafawy, W. S. (2024). The Role of Digital Platforms in Studying the Holy Qur'an: A Case Study based on the Voices of Students from Diverse Cultures at the Prophet's Mosque. *Journal of Ecohumanism*, 3(7), 3050-3062. doi:10.62754/joe.v3i7.4440
42. Zou, B., & Li, J. (2015). Exploring mobile apps for English language teaching and learning. *Proceedings of the 2015 EUROCALL Conference* (pp. 564-568). Dublin: Research-publishing.net.
43. Zarzycka-Piskorz, E. (2016). Kahoot it or not? Can games be motivating in learning grammar?. *Teaching English with Technology*, 16(3), 17-36.
44. Werbach, K. (2015). *Gamification, Coursera Platform*: University of Pennsylvania. Last accessed February, 8, 2016.
45. Pappas, C. (2015). *Gamification vs game-based elearning: How to integrate them into your elearning course design*.
46. Krashen, S. (2014). Does Duolingo “trump” university-level language learning. *International Journal of Foreign Language Teaching*, 9(1), 13-15.
47. Munday, P. (2016). The case for using DUOLINGO as part of the language classroom experience (Duolingo como parte del curriculum de las clases de lengua extranjera).
48. White, K. (2014). Duolingo: All the buzz. *The linguistic*, 53(1).
49. Cakir, I. (2015). Opinions and attitudes of prospective teachers for the use of mobile phones in foreign language learning. *Contemporary Educational Technology*, 6(3), 239-255.
50. Naidu, S. (2006). *A Guidebook of Principles, Procedures, and Practices*. Commonwealth Educational Media Center for Asia. New Delhi, India: Director CEMCA.
51. Tyler, R. (2014). *Mobile tech-defining mobile technology for legal professionals*.
52. Nezarat, A., & Miangah, T. M. (2012). *An Intelligent Agent Based Model for Cross-Language Retrieval of Chunks using Linguistic Corpora*.
53. Beatty, K. (2013). *Teaching & researching: Computer-assisted language learning*. Routledge.
54. Klimova, B. (2018). Mobile phones and/or smartphones and their apps for teaching English as a foreign language. *Education and Information Technologies*, 23, 1091-1099.
55. Techopedia (2020). Available at: <https://www.techopedia.com/definition/2953/mobile-application-mobile-app>.



56. Rossing, J. P., Miller, W. M., Cecil, A. K., & Stamper, S. E. (2012). iLearning: The future of higher education? Student perceptions on learning with mobile tablets. *Journal of the Scholarship of Teaching and Learning*, 1-26.
57. Gilgen, R. G. (2004). Creating a mobile language learning environment. In PowerPoint presentation presented at the Educause Midwest Regional Conference, Chicago, IL. Retrieved June (Vol. 30, p. 2005).
58. Böhm, S., & Constantine, G. P. (2016). Impact of contextuality on mobile learning acceptance: An empirical study based on a language learning app. *Interactive Technology and Smart Education*, 13(2), 107-122.
59. Kapp, K. M. (2012). The gamification of learning and instruction: Game-based methods and strategies for training and education. Pfeiffer.
60. White, K., & Siracusa, F. (2013). Translating with Duolingo for Language Learning, *The FLTMAG*, Nov 8.
61. Lionetti, L. (2013). Duolingo In: <https://lclionetti.files.wordpress.com/2013/11/duolingo-e-learning-tool.pdf>.