


# Perceptions of Self-Learners of English Toward Mobile Language Learning: Technology Acceptance Model and Constructivist Learning Theory Perspectives

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## ABSTRACT

This mixed-method research was conducted to examine the perceptions of self-learners of English as a foreign language (EFL) toward mobile learning (m-learning) apps. It integrated several constructs from the technology acceptance model (TAM) and constructivist learning theory (CLT) to provide a detailed picture of the learners' perceptions. The study also examined variations in learner perceptions based on their gender and age. A total of 292 participants took part in this research, and data were triangulated from quantitative and qualitative instruments. The findings revealed positive perceptions among the learners toward English m-learning apps as well as a strong and positive relationship between the learners' TAM-based and CLT-based perceptions. Although gender did not significantly affect the learners' perceptions, age did exert some influence on both behavioral intention and actual use of the apps. The study concludes with several pedagogical implications and recommendations for future research.

## KEYWORDS

Constructivist Learning Theory, Independent Language Learning, Learner Perceptions, Mobile Language Learning, Self-Learners of English, Technology Acceptance Model

## INTRODUCTION

In today's globalized world, technological innovations have emerged as promising tools that offer learners new ways to learn foreign languages effectively. Mobile learning (m-learning) integrates mobile technology and digital learning and refers to learning a language using portable electronic devices such as smartphones and tablets, which are available anytime and anywhere (Kukulskahulme & Shield, 2008; Sandberg et al., 2011). In this mode of learning, individuals use specifically designed mobile applications (i.e., apps) to learn a language or advance their existing language skills (Duman et al., 2015). M-learning seems to have become an integral component of modern language

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education (Elaish et al., 2023; Yuan et al., 2023). This is often attributed to its ability to empower learners to take control of their learning and seek out opportunities for language practice (Botero et al., 2019; Kohnke, 2023).

Nevertheless, the success of m-learning depends primarily on learners' perceptions and acceptance of this learning mode, which can be influenced by various factors, such as cultural background, previous learning experiences, and individual characteristics and preferences (Botero et al., 2018; Cheng, 2015; Hao et al., 2017). A review of previous research on the use of m-learning reveals that the majority of studies have focused on these tools' implementation by teachers or researchers in formal educational settings, mainly higher education institutions (e.g., Abu-Ayfah, 2020; Almekhlafy & Alzubi, 2016; Aloraini & Cardoso, 2022; Chang et al., 2012; Hsu & Lin, 2022; Jeong, 2022; Peng et al., 2023). A few studies have also investigated the perceptions of K-12 students toward m-learning platforms (e.g., Aziz et al., 2018; Gharehblagh & Nasri, 2020). However, to my knowledge, only a very small number of studies (e.g., Godwin-Jones, 2019; Reinhardt & Thorne, 2020) have attempted to examine the perceptions of self-learners of English as a foreign language (EFL) toward m-learning apps, and there is a lack of such research in the Arab world. In the context of this study, the term "self-learners" refers to individuals who learn English independently—i.e., without receiving any formal language instruction (Aljasir, 2022). They take the initiative to learn English on their own, including setting goals and monitoring their progress. Nonetheless, the m-learning literature is dominated by classroom-based studies while overlooking learners' own use of this learning mode, their preferences in selecting apps, and the language skills they are keen to develop (Ganapathy et al., 2016; Ma, 2017). As Stockwell (2007) suggested, research on m-learning in classroom settings will yield different findings when learners are allowed to make their own choices about the use of m-learning outside the classroom. This is probably because in informal settings, learners have the freedom to select the tasks and activities that they find engaging and that cater to their preferred style and pace of learning (Kukulaska-Hulme, 2012).

This study seeks to address the existing gap in the literature by providing useful insights into the perceptions of self-learners of EFL toward m-learning apps. In this context, the learner exercises great control over the learning process, goal setting, and the determination of the path taken to gain desired knowledge (Eshach, 2007; Marsick & Watkins, 2002). Understanding self-learners' perceptions can aid in the development of interactive content and engaging features tailored to learners' needs and preferences. This, in turn, can facilitate self-directed learning and empower individuals to take charge of their learning journeys (Botero et al., 2019; Lai et al., 2016) within the limitations of m-learning app capabilities. This research is guided by two prominent theoretical frameworks: the technology acceptance model (TAM) and the constructivist learning theory (CLT). The TAM was proposed by Davis (1985) and adapted by subsequent works of Venkatesh and Davis (1996, 2000) to assess the success of technology implementation and to examine the factors that impact its adoption. A number of researchers have also proposed the integration of different models to enrich the TAM (e.g., Abdullah & Ward, 2016; Hsu & Lin, 2022; Peng et al., 2023; Voicu & Muntean, 2023; Wu & Chen, 2017; Yoon & Kim, 2007). A close examination of previous research on m-learning reveals that this mode of learning generally aligns with the main constructivist concepts by facilitating learner-centeredness, offering opportunities for active engagement and knowledge construction, and creating authentic language contexts (see Viberg & Gronlund, 2013; Qiu, 2019; Zou & Yan, 2014). Constructivism is rooted in the works of Piaget (1973), who developed the cognitive constructivism view of learning, and Vygotsky (1978), who developed the social constructivism view. It is defined as "an approach to learning that holds that people actively construct or make their own knowledge and that reality is determined by the experiences of the learner" (Elliott et al., 2000, p. 256). The CLT emphasizes the active role of learners in constructing their own understanding and knowledge of the world. That is, it emphasizes the importance of learner-centeredness and engaging content in facilitating meaningful learning experiences (Qiu, 2019). Therefore, the present study draws on several constructs of the CLT to

provide a richer, more detailed picture of learners' perceptions of m-learning. To my knowledge, no study has attempted to enrich the TAM findings by incorporating explanations from the CLT perspective. The investigation is guided by the following research questions:

1. In light of the TAM, what perceptions do self-learners of English have of m-learning apps?
2. In light of the CLT, what perceptions do self-learners of English have of m-learning apps?
3. What is the relationship between the learners' TAM-based and CLT-based perceptions?
4. Are there differences in the learners' perceptions based on their gender and age?

To address these questions, a mixed-method design was employed, triangulating data from quantitative and qualitative sources. The findings are discussed in light of the available theoretical and research literature, and a number of pedagogical implications and recommendations for future research are suggested.

## LITERATURE REVIEW

The TAM is a well-established theoretical framework that can aid in understanding how technology integration can enhance language-learning experiences (Chen, 2014; Peng et al., 2023). As explained in several seminal works on the TAM (e.g., Davis, 1989; Venkatesh & Davis, 1996; Venkatesh & Davis, 2000), this model encompasses the following constructs:

1. **Perceived usefulness:** This refers to “the degree to which a person believes that using a particular system would enhance his or her job performance” (Davis, 1989, p. 320). If individuals find a certain technology useful, they are more likely to adopt it. In the domain of language learning, perceived usefulness pertains to learners' belief that utilizing technology will enrich their learning experience and develop their language proficiency. Davis (1989) proposed that the perceived usefulness of a technology could be assessed according to the following characteristics: enabling the user to accomplish tasks more quickly, improving job performance, increasing productivity, enhancing one's effectiveness on the job, making it easier to do the job, and having usefulness in the job.
2. **Perceived ease of use:** This pertains to “the degree to which a person believes that using a particular system would be free of effort” (Davis, 1989, p. 320). Individuals are more likely to adopt a certain technology if they find it easy to learn and use. In the context of language learning, this entails examining the extent to which learners find technology user-friendly and convenient for language learning. The characteristics proposed by Davis (1989) to evaluate the perceived ease of use of a technology are: easy to learn, controllable, clear, understandable, flexible to interact with, easy to become skillful at using, and easy to use.
3. **Behavioral intention:** The TAM suggests that when individuals intend to use a technology based on their perceptions of its usefulness and ease of use, they are more inclined to employ it in practice. In language learning, this component examines learners' willingness to continue using a certain technology in their learning journey.
4. **Actual use:** This is the ultimate outcome of the TAM, and it assesses individuals' actual employment of a technology. In language learning, it examines learners' incorporation of technology into their learning and the alignment between their intentions and actual behaviors.

The TAM suggests that perceived usefulness and perceived ease of use influence individuals' attitudes toward using a technology, which, in turn, impacts their intention to use it (see Davis, 1989; Venkatesh & Davis, 1996; Venkatesh & Davis, 2000). Users' intention to use a technology, along with several external factors, leads to its actual employment (see also Wu & Chen, 2017). The TAM and

its extended versions have been widely utilized in research and practical applications (e.g., Almaiah et al., 2016; Almaiah et al., 2019; Chang et al., 2012; Huang et al., 2007) to examine and enhance the adoption of technological tools, such as websites, software, and mobile apps.

As explained above, learners with positive perceptions of m-learning tend to view m-learning apps as tools that empower them to construct knowledge from their own experiences (see Botero et al., 2019; Jeong, 2022; Ma, 2017). These perceptions harmonize with the following CLT constructs:

1. **Learner-centeredness:** The CLT recognizes the individuality of learners and the diverse methods through which they build their understanding; consequently, it grants them greater autonomy and control over the learning process. M-learning apps that enable personalized learning and provide choices of materials can lead to positive perceptions among learners, as they feel a strong sense of ownership over their learning.
2. **Active engagement:** The CLT posits that learning is most effective when learners actively interact with the material and make sense of it through their personal experiences. They assume an active role in the learning process rather than passively receiving knowledge. Thus, when learners view m-learning apps as opportunities for language exploration and experimentation, they tend to develop positive perceptions of them.
3. **Knowledge construction:** The CLT advocates the importance of learners' preexisting knowledge and experiences in shaping the acquisition of new information. M-learning apps that enable learners to incorporate new information into their preexisting knowledge can foster positive perceptions.
4. **Authentic contexts:** The CLT believes that knowledge is most effectively acquired when it is situated within meaningful and authentic contexts that involve real-world applications. Language learners are likely to develop favorable perceptions of m-learning apps when they can see the practical value of their language skills.

Therefore, as Cavus and Ibrahim (2009) and Nami (2020) pointed out, by facilitating anytime and anyplace access to a variety of self-directed learning materials, m-learning lends itself well to the CLT (for a more detailed explanation of the CLT, see Fox, 2001; Oliver, 2000; Tam, 2000). A common theme prevalent among the existing body of research on English m-learning has been the exploration of the pedagogical benefits of integrating mobile technology into formal language education. The studies by Chang et al. (2012), Hsu and Lin (2022), and Peng et al. (2023) (reviewed below) are grounded in a common theoretical framework, expanding upon the TAM through the incorporation of external variables to investigate how learners of English perceive and engage with m-learning. Chang et al. (2012) extended the TAM with perceived convenience to explore the variables that impacted English learners' acceptance of and attitudes toward m-learning. A medium sample size of 158 Taiwanese college students participated in the study. The findings indicated that perceived usefulness, perceived ease of use, and perceived convenience influenced the learners' attitudes toward and acceptance of m-learning. Additionally, perceived usefulness and attitudes toward m-learning usage significantly influenced the learners' behavioral intentions. These findings have led the researchers to emphasize the effectiveness of the extended TAM in predicting and explaining learners' acceptance of m-learning. In a large-scale quantitative study, Hsu and Lin (2022) extended the TAM by incorporating intrinsic motivation and psychological constructs from action control theory. Data were collected from 557 Taiwanese college students of English using a survey questionnaire. The findings showed, among other things, that intrinsic motivation was a predictor of behavioral intention through perceived usefulness and perceived ease of use, and that perceived ease of use had a moderate influence on behavioral intention through perceived usefulness. A similar larger-scale quantitative study was carried out by Peng et al. (2023), who combined the TAM and stimulus organism response model to assess usage cognition and attitudes toward English m-learning. Data were collected from 1432 Chinese university students using a survey questionnaire adopted from several well-established

scales. The findings revealed that perceived convenience positively influenced perceived usefulness, perceived ease of use, and attitudes toward m-learning. Additionally, significant positive correlations were obtained among perceived usefulness, perceived ease of use, behavioral intention, and learner attitudes toward m-learning.

In contrast to a predefined theoretical framework, the research studies examined below adopt a more flexible approach, presenting diverse insights into the intricate realm of EFL university students' perceptions of m-learning. In a comprehensive mixed-methods study, Dashtestani (2016) examined EFL students' use of mobile devices and their attitudes toward them, shedding light on the dynamics of m-learning in language education. A total of 345 participants were selected from 10 language institutes in Iran. The results showed that the learners held positive attitudes toward m-learning and using mobile devices for learning English. The benefits of m-learning included device portability, ubiquitous access to learning materials, and the integration of multimedia. The study also reported several disadvantages of this technology and, hence, concluded by suggesting guidelines for the effective incorporation of m-learning in teaching English in Iran and similar contexts.

Jeong (2022) conducted a smaller-scale, mixed-methods study to investigate the influence of mobile-assisted language learning (MALL) on the performance of students of English at a university in South Korea. Similar to Dashtestani's (2016) findings, the students expressed positive attitudes toward MALL, reporting that utilizing mobile apps enhanced their motivation and made their learning more engaging and sustainable. The main advantages of employing MALL were device portability, flexibility, and convenient access to educational materials, as well as enhanced interactivity, autonomy, and self-efficacy in learning. Diverging somewhat from the previous studies, the research conducted by Aziz et al. (2018) explored the popularity of using mobile devices for learning English among secondary school students in Pakistan. The researchers found that the students had a great inclination to use mobile phones to learn English. They reported that it facilitated their learning, fostered their independence, and helped improve their listening and communication skills.

Interestingly, research conducted in the Saudi context specifically highlights the role of social media in EFL m-learning. A common theme emerging from such research is the potential role of social media in fostering active participation and engagement in language learning. For example, Almekhlafy and Alzubi (2016) examined the efficacy of the messaging app WhatsApp in providing learners of English with environments conducive to using English. Four English L1 speakers and 40 L2 English students studying in the preparatory year at a public university in Saudi Arabia participated in the study, which involved sharing various activities, ideas, and information via WhatsApp. The findings revealed that the students enjoyed their exposure to English via WhatsApp, where they could engage in meaningful communication with native speakers. They also expressed positive views regarding using mobile devices to enhance their language-learning experiences. A larger-scale quantitative study was carried out by Abu-Ayfah (2020), to investigate college students' perceptions of another messaging app, Telegram, for learning English. The results showed that the majority of the students perceived Telegram as a useful tool for learning English, particularly vocabulary. Building upon the foundation of previous research, Aloraini and Cardoso (2022) aimed to delve deeper into the same subject matter, targeting the same demographics by investigating the attitudes of Saudi learners of English toward the educational benefits of four popular social media apps: WhatsApp, Snapchat, Instagram, and Twitter. The findings revealed significant differences between beginner and advanced students regarding their beliefs about the effectiveness of the four apps. However, these differences did not extend to their selection of apps for learning or their attitudes toward using them beyond the classroom.

To sum up, previous research demonstrates the importance of coupling m-learning content with the unique needs and interests of learners, emphasizing the necessity for interactivity and engagement to ensure effectiveness of EFL m-learning. However, the influences of gender and age in this context have received limited examination. Addressing these research gaps, the current study seeks to explore gender and age as variables that could potentially impact self-learners' perceptions of m-learning apps.

## METHOD

This study employed a mixed-methods approach, incorporating quantitative and qualitative data collection and analyses. This approach was selected to leverage the strengths of each method while mitigating its individual limitations (Johnson & Christensen, 2019). The two theoretical frameworks guiding this research, the TAM and CLT, were used to inform the development of the research instruments and the interpretation of the findings.

### Participants

This research employed purposive sampling as its primary selection method, where specific characteristics of the target population were identified and individuals possessing these characteristics were located (Johnson & Christensen, 2019). The study focused on Saudi adults aged 25–40 who were not engaged in any formal English learning and were self-learning English through mobile apps. All the participants were L1 Arabic speakers who had studied English for six years during their intermediate and secondary education. Both male and female learners were invited to participate to investigate the potential gender-related impacts on their perceptions. The remaining demographic characteristics of the participants are presented in Table 1. The researcher aimed to include a reasonably large sample, exceeding 200 participants, to prevent skewness or kurtosis values from underestimating data variance (Tabachnic & Fidell, 2013). Therefore, recruitment stopped when the total number of participants reached 300. After reviewing the questionnaire responses for missing data, responses from eight participants were excluded, resulting in a final sample size of 292.

### Instruments and Data Collection Procedures

Three types of instruments were employed to collect the data needed for this research: (a) the Mobile English Learning Perceptions Questionnaire (MELPQ), (b) weekly reflective journals, and (c) in-depth semi-structured interviews. The quantitative data were collected using the 20-item MELPQ, which was developed by the researcher to assess EFL learners' perceptions of m-learning apps based on several key constructs of the TAM and CLT. It consisted of three sections. The first collected demographic information, mainly gender, age, English proficiency level, and the frequency of using m-learning apps. The second section was an 8-item scale that assessed the

Table 1. Participants' demographic information

Variable	Value	Frequency	Percentage
Gender	Male	120	41.10
	Female	172	58.90
Age	25–30	123	42.12
	31–35	114	39.04
	36–40	55	18.84
English Proficiency Level	Beginner / Elementary	101	34.59
	Intermediate / Upper Intermediate	84	28.77
	Advanced / Proficient	107	36.64
Frequency of App Usage	Daily	119	40.75
	A few times a week	108	36.99
	A few times a month	65	22.26

learners' perceptions in light of four major constructs of the TAM: perceived usefulness, perceived ease of use, behavioral intention, and actual use. Each was evaluated using two statements on the scale. The last section was an 8-item scale that drew on four relevant constructs of the CLT: learner-centeredness, active engagement, knowledge construction, and authentic contexts. Each was also measured by two items on the scale. A 5-point Likert-type scale was used, with responses ranging from 1 (strongly disagree) to 5 (strongly agree). A "neutral" option was also included to allow respondents to indicate when they were unable to respond to a specific statement. To ensure comprehension and accurate responses, the questionnaire was translated into the participants' native language, Arabic. The English and Arabic versions of the MELPQ were reviewed by three experts (each holding a PhD in applied linguistics, and each with over 15 years' experience of English language teaching), and insightful feedback was received recommending the rewording of four phrases in the Arabic version to accurately convey the intended meaning. Subsequently, back translation into English was performed to ensure precision, and both the English and Arabic versions of the MELPQ were deemed equivalent. The same experts were also requested to assess the content validity of the MELPQ (see Heppner et al., 2015; Johnson & Christensen, 2019), and they contended that the questionnaire items were relevant to the corresponding constructs of the TAM and CLT and that they adequately represented them.

Before commencing the main study, a preliminary small-scale study was conducted to pilot-test the MELPQ. A total of 50 participants, who closely resembled the target population, were invited to participate in this initial phase (see Dörnyei & Taguchi, 2009). The MELPQ was administered to the same group of participants on two separate occasions, with a two-week interval between them. To assess test-retest reliability, Pearson product-moment correlation coefficients ( $r$ ) were computed by comparing the participants' responses to the two administrations of the MELPQ. The results revealed that Pearson's coefficients ranged from a minimum of 0.807 for item 5 to a maximum of 0.937 for item 13. Following Cohen's (2013) guidelines, an  $r$  value falling between 0.50 and 1.0 signifies a large correlation between the items. Importantly, all coefficients were statistically significant at the 0.01 level, affirming the MELPQ's high test-retest reliability. To evaluate the MELPQ's internal consistency, Cronbach's alpha coefficient was calculated, yielding values of 0.967 for the TAM-based scale and 0.971 for the CLT-based scale. As these values exceeded 0.7, it was concluded that the MELPQ exhibited high internal consistency reliability (see Harrison et al., 2020; Pallant, 2020).

Data collection for the main study commenced in October 2022 and was initiated by using personal connections to identify and reach out to individuals possessing the required characteristics. These identified participants were provided with an informed consent form and were assured of their ability to withdraw from the study at any point, with a guarantee that their personal information would remain confidential and would be utilized for research purposes only. Data collection for the questionnaire occurred over a three-month period.

Forty-two participants were requested to maintain weekly reflective journals throughout the study period. These journals served as a qualitative instrument for capturing in-depth insights into their personal experiences, challenges, and evolving perceptions regarding m-learning apps. The sample consisted of 18 males and 24 females aged between 24 and 40 years. Prompts and guidelines were provided to facilitate journal entries, and the participants were given the choice of writing their entries in either Arabic or English.

Within two weeks of receiving the reflective journals, the same 42 participants were requested to participate in semi-structured interviews. They consisted of 10 questions designed in accordance with the TAM and CLT constructs. All interviews were conducted in Arabic to ensure response accuracy, either in person or via video conferencing platforms, based on the participants' preferences. They were audio-recorded and lasted between 30 and 45 minutes. This stage of the research spanned an additional three months.

## Data Analysis

The quantitative data obtained from the MELPQ were entered into IBM SPSS Statistics (version 29) for analysis. Since the sample size exceeded 50 participants, the Kolmogorov-Smirnov test was employed to scrutinize the distribution of the data. The results are displayed in Table 2.

Notably, all values were statistically significant ( $p < 0.05$ ), indicating a non-normal distribution of the data. Therefore, non-parametric statistical tests were employed instead of parametric ones.

The qualitative data in this research comprised 361 journal entries, varying in length from 43 to 72 words. Additionally, the interviews were transcribed, and the qualitative data extracted from the journals and interviews were translated into English and subjected to thematic analysis. The process started with a comprehensive review of the data, followed by the generation of initial codes and the grouping of related codes to identify overarching themes. The themes were subsequently named, refined, and applied to the data. The findings were then organized in a matrix to facilitate an in-depth examination of the themes and their relationships (Merriam & Tisdell, 2016). As initial observations emerged, both the quantitative and qualitative findings were triangulated to support and interpret each other.

## RESULTS AND DISCUSSION

### Research Question 1

To assess the learners' perceptions of m-learning apps in light of the four TAM constructs investigated in this study, descriptive statistics were computed for the MELPQ items 5–12. The results are presented in Table 3.

As mentioned in the "Method" section, the learners' perceptions of English m-learning apps were assessed using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The consistent

Table 2. Kolmogorov-Smirnov test results for data distribution

Construct	Statistical Value	Degree of Freedom	P-Value
Perceived Usefulness	0.205	292	< 0.001
Perceived Ease of Use	0.192	292	< 0.001
Behavioral Intention	0.188	292	< 0.001
Actual Use	0.188	292	< 0.001
Learner-centeredness	0.187	292	< 0.001
Active Engagement	0.204	292	< 0.001
Knowledge Construction	0.213	292	< 0.001
Authentic Contexts	0.185	292	< 0.001

Table 3. Descriptive statistics of the participants' scores on the TAM constructs

Construct	Mean	Std. Deviation	Median	Interquartile Range	Skewness	Std. Error	Kurtosis	Std. Error
Perceived Usefulness	3.66	0.963	4.00	2	-0.532	0.143	-0.196	0.284
Perceived Ease of Use	3.68	0.959	4.00	2	-0.503	0.143	-0.278	0.284
Behavioral Intention	3.66	0.920	4.00	2	-0.427	0.143	-0.444	0.284
Actual Use	3.68	0.973	4.00	2	-0.429	0.143	-0.461	0.284

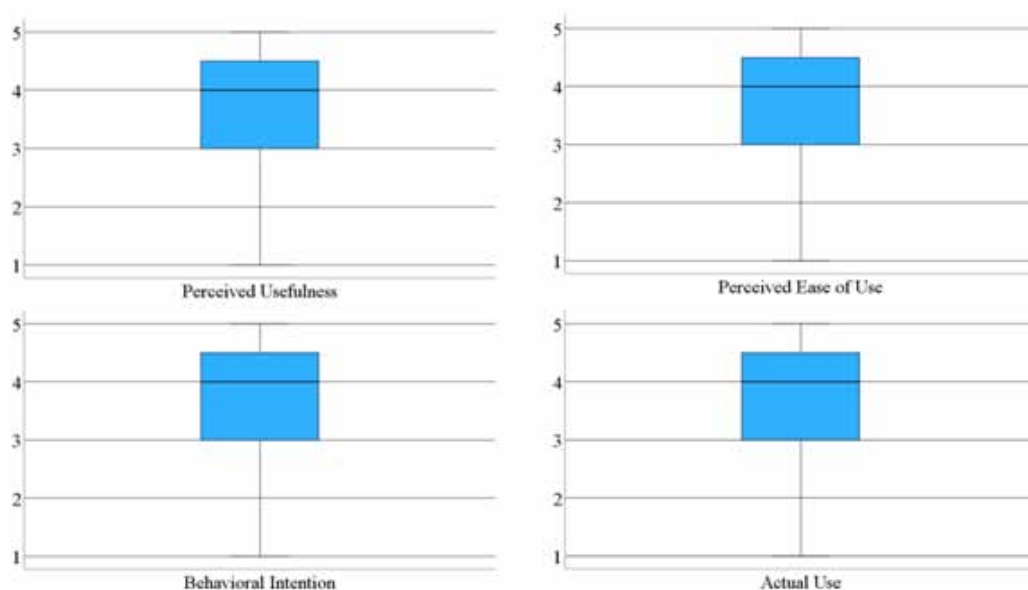


median scores of 4.00 across the four constructs suggest positive perceptions of m-learning apps among the learners. They indicate that the learners perceived the apps as useful and easy to use, expressed an intention to continue using them, and were, in fact, using them actively. Figure 1 depicts the learners' perceptions in light of the TAM.

The participants expressed their belief in the usefulness of m-learning apps, demonstrating recognition of the practical advantages of these apps in enhancing their language skills (MELPQ item 5) and acknowledging the benefits of using them to learn English for their personal and professional development (item 6). The responses also indicated a belief in the ease of using m-learning apps, implying that they had found these apps easy to navigate (item 7) and user-friendly in terms of design and features (item 8). Furthermore, the learners exhibited positive behavioral intentions to continue using m-learning apps, signifying a willingness to regularly use them for learning English (item 9) and to employ them as the primary method for improving their English language skills (item 10). Finally, the results indicated that these positive perceptions translated into actual use, with participants regularly incorporating mobile apps into their English learning routines (item 11) and consistently using them to practice their English language skills (item 12). These findings underscore the potential of m-learning apps to effectively support EFL learning, aligning with the TAM and highlighting the acceptance of the apps and of their utility in language-learning contexts. The findings also corroborate the conclusions drawn in prior research investigating learners' perceptions toward utilizing mobile apps for English language learning (e.g., Aziz et al., 2018; Chang et al., 2012; Dashtestani, 2016; Hsu & Lin, 2022; Jeong, 2022; Peng et al., 2023). The majority of participants in these studies not only believed in the utility of these technological tools but also recognized the practical advantages they offered in terms of enhancing language skills and overall proficiency.

The qualitative data gathered from the reflective journals and interviews were used to gain a deeper and more nuanced understanding of the MELPQ results. In 75.35% of the journal entries, the learners expressed positive TAM-relevant perceptions of m-learning apps, as illustrated in the following excerpts.

Figure 1. Participants' scores on the TAM constructs



*I have started using Anki for my English learning, and it is now a crucial part of my routine. The flashcards are easy to adapt, and I can learn words at my own speed. It is a simple, effective app, and I have noticed that I remember well what I have learned.*

*I have been using Rosetta Stone to learn English, and I am happy with how easy it is to use. It is great that I can practice on my phone, so I can use it wherever I want. I am planning to continue using it because it helps me become better at English.*

Similarly, 73.81% of the interviewees reported favorable TAM-relevant perceptions of m-learning apps, as illustrated in the responses below.

*Yes, I plan to continue using mobile English learning apps. I like them because they help me learn well, have lots of different things to learn, and let me set goals and track my progress. I also like apps like Tandem and HelloTalk because they help me talk to people who speak English, which is really helpful.*

*I usually find learning English with mobile apps straightforward, but I have faced problems like glitches and connection issues several times. Staying motivated can also be tough sometimes. Still, apps like Rosetta Stone and Memrise are fun to use because they are easy to navigate and have interactive features.*

Triangulating data from the various instruments employed in this study enabled the researcher to gain deeper insights into the learners' perceptions of the benefits and challenges of using m-learning apps within the context of the TAM, as shown in Table 4. Notably, the benefits and challenges identified here line up with those reported by learners in diverse EFL contexts (e.g., Dashtestani, 2016; Hsu & Lin, 2022; Jeong, 2022; Xodabande & Hashemi, 2023).

## Research Question 2

The learners' perceptions of m-learning apps based on four key constructs of the CLT were examined by computing descriptive statistics for the MELPQ items 13–20. The results are displayed in Table 5.

The median scores of 4.00 across these constructs reflect positive perceptions among the learners toward m-learning apps. They suggest that the learners viewed the apps as fostering a learner-centered, engaging, knowledge-constructing, and authentic learning environment. Figure 2 depicts the learners' perceptions in light of the CLT.

The participants believed that m-learning apps offered a learner-centered approach, allowing them to set their own goals and progress at their own pace (MELPQ item 13) and catering to their specific needs and preferences (item 14). In addition, the learners believed that m-learning apps facilitated active engagement, enabling them to participate in the learning process (item 15) and to actively engage with the material (item 16). Furthermore, the learners recognized the apps' role in facilitating knowledge construction, enabling them to connect their existing knowledge and cultural understanding with the English language (item 17) and helping them construct a deeper understanding of the language (item 18). Lastly, the participants maintained that m-learning apps provided authentic contexts, including authentic materials, real-world scenarios (item 19), and opportunities to practice language skills in real-life contexts (item 20). These findings provide evidence for the correspondence of the learners' perceptions of m-learning apps with the CLT constructs examined in this study. The findings also provide further validation for earlier investigations in the field of mobile language-learning apps (e.g., Aziz et al., 2018; Bilgin & Tokel, 2018; Jeong, 2022), where the participants believed that m-learning apps supported learner-centered approaches by offering autonomy and catering to individual preferences. They also recognized the apps' effectiveness in

Table 4. Participants' perceptions of m-learning apps in light of the TAM

Perceived Usefulness	
Benefits	Challenges
1. Rich content 2. Multimedia elements 3. Feedback and progress tracking	1. Content quality (not all m-learning apps offer high-quality content) 2. Distractions
Perceived Ease of Use	
Benefits	Challenges
1. Portability 2. Accessibility (anywhere and anytime access) 3. Offline access 4. User-friendly interfaces	1. Technical issues 2. Digital literacy 3. Language barrier (especially for beginners) 4. Data and battery usage 5. Limited screen size
Behavioral Intention	
Benefits	Challenges
1. Flexibility 2. Social features 3. Motivation 4. Cost efficiency	1. Competing priorities 2. Perceived progress (if learners do not see noticeable improvement, they may reduce their app usage)
Actual Use	
Benefits	Challenges
1. Convenience (learners can adapt their use of m-learning apps to their schedules) 2. Continuous learning	1. Lack of discipline 2. Overwhelming options 3. Sustainability

Table 5. Descriptive statistics of the participants' scores on the CLT constructs

Construct	Mean	Std. Deviation	Median	Interquartile Range	Skewness	Std. Error	Kurtosis	Std. Error
Learner-centeredness	3.68	0.929	4.00	2	-0.378	0.143	-0.543	0.284
Active Engagement	3.62	0.945	4.00	1	-0.475	0.143	-0.294	0.284
Knowledge Construction	3.67	0.914	4.00	1	-0.473	0.143	-0.248	0.284
Authentic Contexts	3.68	0.940	4.00	2	-0.537	0.143	-0.184	0.284

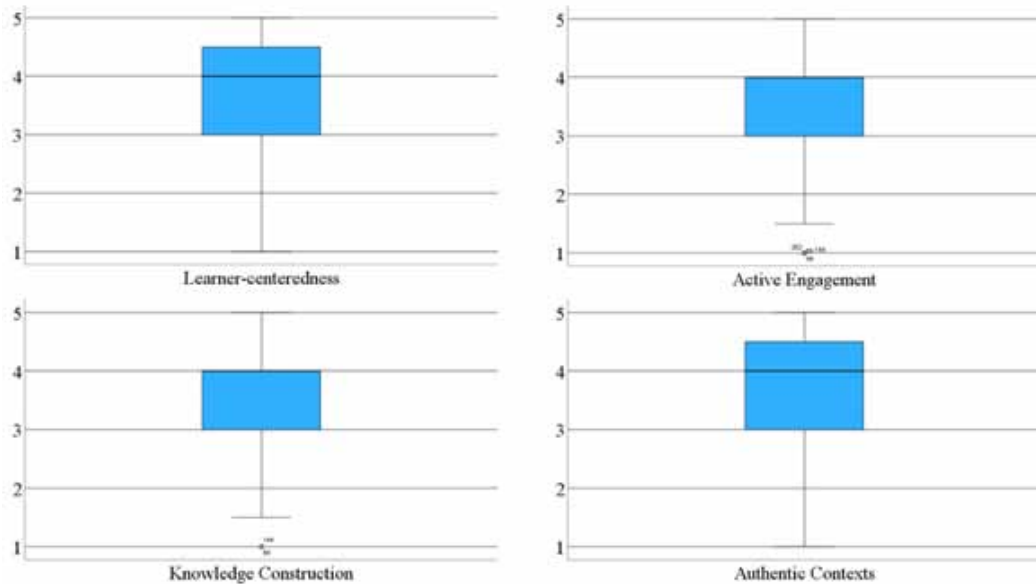
promoting active engagement in English learning, and they appreciated how these apps facilitated knowledge construction and provided authentic contexts for language skill practice.

Similarly, in 77.01% of the journal entries, the learners expressed positive CLT-relevant perceptions of m-learning apps, as illustrated in the following excerpts.

*Babbel has turned learning English into an exciting journey. The app provides interactive lessons, quizzes, and fun games that keep me involved and enthusiastic about learning. I am not just sitting back and listening—I am actively taking part in my own learning.*

*VoA Learning English includes genuine materials like stories, news reports, videos, and audio content. It places me in real contexts, making my language practice feel real and relevant. I have learned so much from these real-world resources.*

Figure 2. Participants' scores on the CLT constructs



76.19% of the interviewees also reported favorable CLT-relevant perceptions of m-learning apps, as illustrated in the responses below.

*I absolutely believe that mobile apps cater to personal learning needs. For example, Memrise lets me pick up my language and adjust the difficulty like a personal tutor. It covers vocabulary, grammar, and conversation. So, yes, I would say the content and activities are personalized and make learning more effective and engaging for me.*

*Mobile apps are excellent at building on what I already know. Anki adapts by showing me difficult words more often than easy ones, linking what I know with what I need to learn. This makes learning smoother and more effective.*

Combining data allowed the researcher to delve deeper into the learners' perspectives on the benefits and challenges of utilizing m-learning apps in light of the CLT framework, as depicted in Table 6. Notably, the benefits and challenges identified here are consistent with those recounted by learners in various EFL settings (e.g., Aziz et al., 2018; Jeong, 2022; Tsai, 2023; Wang & Jou, 2023).

### Research Question 3

The relationship between the learners' TAM-based and CLT-based perceptions was assessed using Spearman's rho correlation coefficient. The results are presented in Table 7.

Remarkably, all correlations were large (i.e., above 0.5 as per Cohen, 2013), positive, and significant at the 0.01 level, indicating a strong relationship between the examined constructs. This suggests that when learners perceive m-learning apps as useful and easy to use, and when they regularly use them with a strong intention to continue incorporating them into their learning, they also tend to view these apps as facilitating a learner-centered approach to language learning, encouraging active engagement and knowledge construction

**Table 6. Participants' perceptions of m-learning apps in light of the CLT**

Learner-Centeredness	
Benefits	Challenges
1. Autonomy 2. Personalized learning 3. Self-assessment	1. Self-discipline 2. Lack of guidance
Active Engagement	
Benefits	Challenges
1. Interactive content 2. Social features 3. Immediate feedback	1. Overstimulation 2. Lack of human interaction
Knowledge Construction	
Benefits	Challenges
1. Tailored resources 2. Cognitive engagement 3. Resource diversity	1. Limited depth 2. Difficulty with complex topics
Authentic Contexts	
Benefits	Challenges
1. Real-world materials 2. Cultural awareness	1. Language variation 2. Comprehension difficulty

**Table 7. Correlations between learners' TAM-based and CLT-based perceptions**

Construct	Learner-Centeredness	Active Engagement	Knowledge Construction	Authentic Contexts
Perceived Usefulness	0.891**	0.879**	0.889**	0.892**
Perceived Ease of Use	0.908**	0.903**	0.885**	0.920**
Behavioral Intention	0.900**	0.901**	0.900**	0.893**
Actual Use	0.917**	0.898**	0.866**	0.902**

within authentic contexts. This synchronization between the TAM and CLT suggests that the learners not only accepted the technology but also engaged with it in a way consistent with constructivist learning principles.

As mentioned earlier in this paper, previous research on the use of technological innovations in EFL learning has sought to enhance the TAM by integrating elements from various models (e.g., Abdullah & Ward, 2016; Hsu & Lin, 2022; Peng et al., 2023; Voicu & Muntean, 2023; Wu & Chen, 2017; Yoon & Kim, 2007). However, to my knowledge, this study represents the first incorporation of the TAM and CLT constructs, making direct comparisons with prior research unfeasible. Analyzing qualitative data from the learners' reflective journals, particularly entries in which they freely expressed their perceptions, yielded valuable insights, as demonstrated by the following excerpts.

*I explored the Memrise language-learning app on my smartphone, and I appreciate the way this app is designed. It is not too complicated, and the lessons are quite engaging. I found real-life situations*

*in the app helpful for practicing English. Overall, it reinforced my belief that using my smartphone for language learning is a smart choice.*

*Using Duolingo has been incredibly helpful in my English-learning journey. I love how I can set daily goals and choose from various lessons, which makes me feel in control of my learning, and I am seeing real progress.*

These excerpts highlight the close harmony between the learners’ TAM-based and CLT-based perceptions of m-learning apps.

#### Research Question 4

The Mann-Whitney U test was performed to compare the scores of male and female learners on the MELPQ. The results, as displayed in Table 8, indicate that there were no significant differences between the scores.

This finding indicates that gender did not play a significant role in shaping the learners’ perceptions, as both males and females reported similar perceptions of m-learning apps. These findings support previous research (e.g., Hilalo & Wichadee, 2017; Tan et al., 2012), in which male and female learners did not differ in their usage, attitudes, and learning performance when using mobile phones for language learning. A thorough analysis of the qualitative data collected in this study reveals a striking agreement in the perspectives and preferences of both male and female participants regarding m-learning apps. This indicates that these apps may have been thoughtfully crafted to meet the learning needs of both genders, establishing common ground that accommodates both equally.

The Kruksal-Wallis test was conducted to examine differences in learners’ perceptions based on their age. The results are shown in Table 9.

Notably, statistically significant differences ( $p < 0.05$ ) were obtained among the three age groups with regard to behavioral intention and actual use of m-learning apps, with younger learners exhibiting more favorable perceptions than older ones. This suggests that age had a slight influence on learners’ perceptions of m-learning apps. Younger individuals appeared more inclined to express a positive intent to engage with and actually use m-learning apps, possibly reflecting their greater familiarity and comfort with technology compared to their older counterparts. These findings cannot be directly compared to prior research on language m-learning due to a noteworthy difference in participant demographics. The majority of previous studies focused on a uniform age group, such as college or secondary school students; therefore, age-based comparisons were not undertaken, as explained in

Table 8. Summary of Mann-Whitney U test results for perceptions toward m-learning apps based on gender

Construct	Males		Females		U-Value	Z-Value	P-Value
	Median	N	Median	N			
Perceived Usefulness	4.00	120	4.00	172	10142.500	-0.256	0.798
Perceived Ease of Use	4.00	120	4.00	172	9767.000	-0.795	0.427
Behavioral Intention	3.75	120	4.00	172	9645.500	-0.969	0.333
Actual Use	4.00	120	4.00	172	9743.000	-0.830	0.407
Learner-centeredness	4.00	120	4.00	172	10117.500	-0.291	0.771
Active Engagement	4.00	120	4.00	172	9705.500	-0.886	0.376
Knowledge Construction	4.00	120	4.00	172	9672.000	-0.939	0.348
Authentic Contexts	4.00	120	4.00	172	9715.000	-0.868	0.386

Table 9. Summary of Kruskal-Wallis test results for perceptions toward m-learning apps based on age

Construct	Group	N	Kruskal-Wallis (H)	Degree of Freedom	Chi-Square (X <sup>2</sup> )	P-Value	Mean Rank
Perceived Usefulness	25–30	123	15.632	2	5.429	0.066	162.24
	31–35	114					147.43
	36–40	55					109.38
Perceived Ease of Use	25–30	123	11.685	2	5.419	0.067	159.66
	31–35	114					148.04
	36–40	55					113.89
Behavioral Intention	25–30	123	14.360	2	7.669	0.022	161.00
	31–35	114					148.34
	36–40	55					110.27
Actual Use	25–30	123	16.463	2	7.628	0.022	161.84
	31–35	114					148.70
	36–40	55					107.64
Learner-centeredness	25–30	123	12.523	2	5.740	0.057	160.63
	31–35	114					147.34
	36–40	55					113.16
Active Engagement	25–30	123	12.472	2	3.613	0.164	157.02
	31–35	114					152.08
	36–40	55					111.40
Knowledge Construction	25–30	123	12.066	2	1.590	0.452	162.39
	31–35	114					143.83
	36–40	55					116.50
Authentic Contexts	25–30	123	8.567	2	4.600	0.100	156.67
	31–35	114					149.37
	36–40	55					117.81

the “Literature Review” section. Nonetheless, a thorough analysis of the qualitative data obtained in this research appeared to suggest that younger users tended to be more positive about these apps than older ones, as illustrated below.

*Using LingQ today was great—I found it simple to use and it made learning English enjoyable. I am motivated to continue using it regularly because it helps me get better at English in a fun way, making my learning journey exciting and engaging. (participant in the 25–30 group)*

*Today, I had a positive experience using Rosetta Stone. It is user-friendly and makes learning English feel easier and more enjoyable. I am excited to keep using it to improve my English language skills step by step. (participant in the 31–35 group)*

*I tried two different apps last week but found them a bit confusing and not as engaging as I had hoped. I am unsure if I will stick to using them as they did not fully capture my interest or make learning English as enjoyable as I had expected. (participant in the 36–40 group)*

## CONCLUSION

The results from the first research question indicated that the learners held positive perceptions regarding the use of m-learning apps to improve their English language skills. They not only recognized these tools' usefulness and ease of use but also displayed a clear intention to continue using these apps as their primary method for improving their English language skills. Most importantly, the learners followed through on this intention by regularly incorporating m-learning apps into their language-learning routines. The insights provided in this study offer a comprehensive understanding of learners' perceptions of m-learning apps and the benefits and challenges associated with them. Recognizing these benefits and addressing the challenges identified can inform the development and implementation of more effective m-learning apps to further enhance language-learning experiences.

The findings from the second research question unveiled positive perceptions among the learners when evaluating m-learning apps through the lens of the CLT. They expressed beliefs in the potential of m-learning apps to offer learner-centered, engaging, knowledge-constructive, and authentic language-learning experiences. These findings strengthen the case for the utility and effectiveness of m-learning apps in language learning. App developers should take note of this alignment and prioritize app personalization, interactivity, and real-world contexts.

Furthermore, the results from the third research question revealed a strong and positive relationship between the learners' perceptions of m-learning apps based on the TAM and CLT constructs. This attunement between the TAM and CLT not only underscores learners' acceptance of technology but also highlights their active engagement with it in a manner consistent with constructivist learning principles. While previous research has explored the integration of elements from various models to enhance the TAM in the context of EFL learning, this study represents a novel approach by incorporating the TAM and CLT constructs. The absence of direct comparisons with existing studies underscores the uniqueness and innovation of this research. These findings offer valuable insights for both educators and app developers, emphasizing the importance of designing m-learning apps that not only focus on usability and usefulness but also line up with the pedagogical principles of the CLT.

Finally, the findings from the fourth research question demonstrated that, although gender did not significantly affect the learners' perceptions of m-learning apps, age did exert some influence on both behavioral intention and actual use of these apps. These findings offer useful insights for educators and app developers as they highlight the need to consider age-related factors to enhance learners' experiences, such as creating user interfaces and types of content that are intuitive and engaging for older learners.

Based on the findings of this mixed-methods exploratory study, the author suggests several recommendations for future research in the field. First, there is a need to conduct longitudinal studies to examine how learners' perceptions of m-learning apps evolve over time. This can provide insights into the sustainability of positive perceptions and the factors that influence changes in perceptions. Additionally, exploring the perceptions of self-learners from diverse cultural backgrounds toward m-learning apps can provide insights into the cultural influences on app preferences and usage. Finally, future research may examine the design and pedagogical approaches embedded in m-learning apps, with a focus on the TAM and CLT constructs, in order to foster the creation of more learner-centered and engaging apps, leading to increased acceptance and adoption among users.

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## **CONFLICT OF INTEREST**

The author of this publication declares there is no conflict of interest.

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## APPENDIX A

### The Mobile English Learning Perceptions Questionnaire (MELPQ)

Dear Participant,

Thank you for agreeing to take part in this research. Your feedback is invaluable to us. Before we begin, we would like to gather some basic demographic information to better understand the background of our respondents. Please take a moment to provide the following details.

1. Gender
  1. Male
  2. Female
2. Age
  1. 25–30
  2. 31–35
  3. 36–40
3. Current English proficiency level
  1. Beginner / Elementary
  2. Intermediate / Upper Intermediate
  3. Advanced / Proficient
4. Frequency of using mobile English learning apps
  1. Daily
  2. A few times a week
  3. A few times a month

Now, we would like to understand your perceptions of using mobile apps for learning English. Please read each statement and indicate your level of agreement or disagreement. There are no right or wrong answers; we value your honest input.

5. Using mobile English learning apps enhances my language skills.
  1. Strongly disagree
  2. Disagree
  3. Neutral
  4. Agree
  5. Strongly agree
6. Learning English with mobile apps is advantageous for my personal and professional development.
  1. Strongly disagree
  2. Disagree
  3. Neutral
  4. Agree
  5. Strongly agree
7. I find it easy to use and navigate mobile English learning apps.
  1. Strongly disagree
  2. Disagree
  3. Neutral
  4. Agree
  5. Strongly agree
8. Mobile English learning apps are user-friendly (i.e., the design and features are easy to understand).
  1. Strongly disagree
  2. Disagree

3. Neutral
  4. Agree
  5. Strongly agree
9. I intend to regularly use mobile apps for learning English.
1. Strongly disagree
  2. Disagree
  3. Neutral
  4. Agree
  5. Strongly agree
10. I intend to use mobile apps as a primary method of improving my English language skills.
1. Strongly disagree
  2. Disagree
  3. Neutral
  4. Agree
  5. Strongly agree
11. I find myself consistently using mobile apps as part of my English learning routine.
1. Strongly disagree
  2. Disagree
  3. Neutral
  4. Agree
  5. Strongly agree
12. I regularly use mobile apps to practice my English language skills.
1. Strongly disagree
  2. Disagree
  3. Neutral
  4. Agree
  5. Strongly agree
13. Mobile English learning apps allow me to set my own goals and progress at my own pace.
1. Strongly disagree
  2. Disagree
  3. Neutral
  4. Agree
  5. Strongly agree
14. Mobile English learning apps are designed to cater to the specific needs and preferences of individual learners.
1. Strongly disagree
  2. Disagree
  3. Neutral
  4. Agree
  5. Strongly agree
15. I actively participate in the English learning process when using mobile apps.
1. Strongly disagree
  2. Disagree
  3. Neutral
  4. Agree
  5. Strongly agree
16. Mobile English learning apps allow me to actively engage with the material.
1. Strongly disagree
  2. Disagree
  3. Neutral

4. Agree
  5. Strongly agree
17. Mobile English learning apps enable me to connect my existing knowledge and cultural understanding with the English language.
1. Strongly disagree
  2. Disagree
  3. Neutral
  4. Agree
  5. Strongly agree
18. Mobile English learning apps help me construct a deeper understanding of the language.
1. Strongly disagree
  2. Disagree
  3. Neutral
  4. Agree
  5. Strongly agree
19. Mobile English learning apps incorporate authentic materials and real-world scenarios.
1. Strongly disagree
  2. Disagree
  3. Neutral
  4. Agree
  5. Strongly agree
20. Mobile English learning apps provide me with opportunities to practice language skills in real-life contexts.
1. Strongly disagree
  2. Disagree
  3. Neutral
  4. Agree
  5. Strongly agree

Thank you for completing this questionnaire.

## APPENDIX B

### Interview Protocol

1. Could you please tell me about your current experience with using mobile apps for learning English?  
Do you use any specific apps regularly?
2. How helpful do you believe mobile apps are for learning English compared to traditional methods?  
Can you give specific examples of how it has been useful to you?
3. How easy or difficult do you find it to use mobile English learning apps? Are there any particular challenges you have encountered in using them?
4. Would you say you have a strong intention to continue using mobile English learning apps in the future? What factors influence your decision to use or not use these apps?
5. Could you describe the frequency and duration of your actual usage of mobile English learning apps? What type of content or activities do you engage with most often?
6. In your opinion, do mobile apps cater to your individual learning needs and preferences? How personalized do you feel the content and activities are on these apps?



7. How engaged do you typically feel when using mobile English learning apps? Can you provide examples of activities or features that encourage your active participation?
8. Can you describe how mobile apps assist you in building new knowledge and language skills based on what you already know or have previously learned?
9. Mobile apps often aim to provide authentic language experiences. Can you share any experiences where you felt that the content or activities on these apps closely resembled real-life language use situations?
10. Is there anything else you would like to add regarding your experiences with mobile English learning apps?

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