ENHANCING READING COMPREHENSION FOR L2 LEARNERS OF ENGLISH: INSIGHTS FROM A COMPARISON OF MOBILE APPLICATIONS BASED ON CURRENT THEORETICAL STANDPOINTS

Luz Adriana Giraldo Berrio

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AFFIDAVIT

I, Luz Adriana Giraldo Berrio, hereby declare that this master's thesis has not been previously presented as a degree requirement, either in the same style or with variations, in this or any other university.

LUZ ADRIANA GIRALDO BERRIO

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Abstract

The purpose of this thesis was to determine the functionality of mobile applications to improve reading comprehension skills in L2 students university students belonging to a language institute in Colombia. This research was developed from the interpretative paradigm. The instruments that were used were: a multiple-choice survey, in a population of ninety-four students who take English as a foreign language at the university level also participated in the study. Additionally, documentary data to understand the functionality of mobile applications was collected from the Google Play app store, which describes the features of the apps in terms of functionality and purpose. A qualitative analysis was carried out through the categorization, labeling and coding of data recurrences. Among the main findings, they converged that the Duolingo, Wlingua and Beelinguapp applications, which were the most complete in terms of the teaching and learning process, and academic performance, were also the most recognized by the population, which should motivate the student to continue using the applications, and in a later period, evaluate how it has impacted the development of English. It should be considered that applications should continue to grow as a tool to learn English. However, these apps must evolve, allowing students to interact with other users, in chat rooms, online classes with student participation, and evaluations with native teachers, among others. In conclusion, paid or free applications do not guarantee learning; Payment only enables app content, but it will depend on the app user.

Keywords: critical reading, mobile applications, foreign language, learning.

Chapter 1: Introduction

Thanks to globalization and technology, there is more communication between countries of different languages and cultures, giving exposure to new content and information in different languages. Also, the invention of smaller devices provided a faster and more interactive way to stay in touch with other cultures, trends, and people. Suárez-Orozco and Sattin (2007) consider the instantaneous exchange of ideas and information around the world advantageous. However, there is a need to exploit technological devices for teaching methods and learning (Ahmed y Parsons, 2013).

According to the International Telecommunication Union (2016), mobile phone networks cover around 95% of the planet's population. For that reason, educators take advantage of aspects of mobile learning, namely the popularity, portability, and flexibility of these devices inside or outside of a classroom. (Ali & Santos, 2012; Motiwalla, 2007; Sharples, 2000; Wood et al., 2011). Heifetz (2011) citado en Brantes (2013) considers mobile technology in learning as an advantage since it is accessible, adapts to the needs of students, produces knowledge retrieval, and allows students to share knowledge through their devices. (pg. 65).

Schools and educational institutions within Colombia are beginning to require teachers to adapt content and class programs to teach through technology-mediated classes and activities. Mobile technology has opened a door of freedom and new possibilities to learn anytime, anywhere, and with whomever (McDougald, 2013). According to Heifetz (2011), mobile technology in learning is beneficial as it is accessible, adapts to student needs, is quickly reviewed, and allows students to share information.

Background of the Problem

Many countries have mandated the implementation of English as a second or foreign language. Between 2004 and 2016, Colombia renewed its educational policy with Law 1651, the national bilingualism law. The Congress of the Republic of Colombia (2013) explained that this law is to develop reading, writing, and oral expression skills in English at all levels of education.

Mejia (2006) mentions that although bilingual education has grown, published research on the linguistic aspect mainly focuses on the empirical. Also, there are cultural aspects where some schools focus too much on language making students bilingual but not bicultural, which can be a long-term problem because the language has a connection to culture. Melandita (2019) agrees that "unfamiliar cultural context and differences between culture content knowledge and vocabulary cause reading incomprehension…" (p. 22). It does not matter if the text is legal, commercial, scientific, or even a newspaper; if the reader does not have the necessary knowledge, she will not understand the text. In terms of how bilingualism is taught in middle and high schools, in private and public institutions, there are notable differences in English language teaching, both in intensity and in the integration of language into subjects. Regarding private educational institutions, the quality, knowledge of the language (native level), the methodology used, the allocation of time, and the objectives stand out; this represents substantial learning advantages.

On the other hand, due to deficiencies in public and governmental educational policies, bilingualism is not required as a primary requirement in public entities. This is due to the lack of trained teachers, economic investment, and the non-inclusion of the national education plan. The English teaching methodology is from a specific subject but not from the comprehensiveness and multidisciplinary age. This lack of teaching, and an interest in studying a second language,

obliges them to have the only option of entering educational institutions specialized in language teaching.

The above discussion generates learning gaps by comparing private and public entities. The latter limits the number of students due to the need for a second language to develop professionally; one cannot access the best learning methodologies and dynamics. Mobile technology use is still new within Colombia, limiting technology adaptation for education or other resources. Still, it could help solve the discrepancies in mastering a second language. Most university students have access to mobile technology and may use it to search, reinforce, or improve any learning area, particularly reading comprehension skills.

One of the challenges in learning a second language is that students need appropriate materials and the motivation to learn. For efficient learning, mainly in reading skills, students need to understand and interpret the written text, have good grammar and syntactic levels, and draw conclusions about new information. Even in a native language, proficient reading comprehension takes time to structure the necessary knowledge, especially if the text is at a language level higher than the student's knowledge.

Reading comprehension skills are the most studied in language teaching, which has helped to develop the learning process using written texts. Bernal and Bernal (2020) agree that "the ability to read may be the most crucial skill to develop when learning a foreign language and most important to teach in ESL/EFL courses" (p. 19). Since reading in another language can be frustrating for students, it is essential to help them develop their reading skills and promote interpretation and critical thinking (Del Toro et al., 2019).

When deepening reading comprehension through mobile applications, it is necessary to talk about the educational context in Colombia and, thus, frame the teaching guidelines. In the

academic context in Colombia, the inclusion of technologies as a leveraging methodology for the learner in any educational discipline is very slow, considering what education was like before Covid-19, with a higher prevalence of face-to-face instruction and few educational entities that used virtual education. With the appearance of the pandemic, education resorted to the virtual methodology, and it was mandatory to apply the methodology and design content to achieve the objectives of each subject.

Research Question

This qualitative case study looks at mobile apps that focus on helping students improve their reading comprehension skills in English as a foreign language (L2). It will explore various mobile applications that could improve the reading comprehension skills of university students in Colombia. The study is relevant as it addresses the challenges facing our society today due to the impact of remote learning. It also increases the possibility that students can improve their reading comprehension skills in their L2 using interactive tools.

This study seeks to answer the central question: What is the functionality of mobile applications to improve reading comprehension in L2 students? From this problem, different questions arise about the use of digital tools or applications (apps):

- Is there an interest in acquiring the apps?
- Do students or teachers benefit from their use?

The above leads to a general objective of the study, which is to determine the functionality of mobile applications to improve reading comprehension skills in L2 students. Therefore, specific objectives arise, which are:

- Categorize the features of existing reading comprehension mobile apps.
- Compare the critical components of reading comprehension with existing mobile apps.

- Analyze the perceptions of mobile apps among users who take English as a foreign language.
- Determine the functionality of mobile apps through triangulation.

The Setting of the Study

This study explored the learning interests of L2 university students belonging to a language institute in Colombia. Ninety-four participants from different careers provided opinions on the applications selected for the study. All sources of inquiry related to language learning.

Organization of the Thesis

The first part of this study described the background of the panorama of the problem to be addressed, a product of which the problem question was raised, which the study sought to answer, explaining the different related topics, including reading comprehension, mobile technology**,** and mobile applications for learning a second language. To this end, the objectives of the research are determined. In Chapter 2, the literature review, key concepts are defined along with the focus and understanding of the research. Similarly, Chapter 3, research methodology, explains the idea of the data collected and presents the analysis of the applications used to improve reading comprehension. It then continues in Chapter 4, where the results are discussed, comparisons are made between the applications**,** and the results are contrasted with the proposed objectives with the theoretical model that supports the research. From all of the above, it moves on to point 5, the conclusions that answer the research question and discuss the most relevant points that are briefly synthesized, contributing to the knowledge explored in the study.

Chapter 2. Theoretical framework and literature review

This study focuses on the functionality of mobile applications to help develop reading comprehension in second language learning. This section focuses on relevant theories applied to teaching English, reading comprehension theories, and teaching with technology, among other relevant theoretical and practical points.

Teaching English in Colombia

Gonzalez (2010) citing Cárdenas (2017) explains the history of Colombia related to English and offers a broad vision of the difficulties. She describes that since the beginning of English teaching, there have been significant educational discrepancies in students' socioeconomic status. Many areas were marginalized because access to education was shown to be more difficult. One reason is that English was mainly offered in private schools, language centers, and higher education institutions. It was not until globalization that the policies began to shift with projects related to teaching English in Colombia. Some of these plans were: *Programa de Inglés* (English Syllabus) in 1982, *Ley General de Education* (General Law of Education) in 1994, *Proyecto Educativo Institucional* (Institutional Educational Project) in 1999, and *Revolución Education* (Educational Revolution) in 2000. The main difficulty continued to be equitable access to English language teaching.

From 2004 to 2016, the Colombian Ministry of Education (MEN) launched national bilingualism laws and planned to regulate English language teaching in the country. The new policies and strategies aimed at increasing the competitiveness of Colombian citizens so that they can participate in international dynamics by speaking English (MEN, 2014b). Bull et al. (2019) consider these strategies a significant challenge to the quality of the educational system in general, not only for teaching but also for learning.

Colombia also added professional development strategies to improve the level of bilingualism (Spanish and English) (MEN, 2006) through various strategies such as teaching and its application in the classroom, improving the didactic materials used by students, international immersions for teachers, training workshops, provision of texts, and didactic materials. Today, there are more educational resources in Colombia related to learning English, such as the Basic Rights of Learning English at the primary, middle, and secondary levels. (MEN, 2016b). Like these, many strategies are planned to teach students to use a foreign language. Bull et al. (2019) mention that only 1 in 10 Colombian children can read and recognize information in a text and understand it.

In the same way, Brown and Bird (2018) question the concept of quality in education and suggest improvements to the educational system. To achieve a sound education system, teachers must have professional qualifications to teach the language, pass on their knowledge, and update educational materials to meet their students' learning needs and expectations. Another aspect that language teachers must achieve is the development of communication skills that require a learning environment where students can practice, investigate, experiment, and share information to solve problems (del Toro et al., 2019, p. 58)

Education is effective if the objectives and goals are clear to the students and respond mainly to the interests of some members of society. Education is efficient when there is an optimal use of available resources, meaning quality is measured from the student's perspective (Moreno & Pajaro, 2018). Quality education is one of the most important objectives for many countries that wish to develop individual teaching and learning practices, particularly in Colombia. Over the years, the strategies mandated by Congress and the MEN have been big stepping stones in strengthening English language learning outcomes. Still, innovative practices

and strategies are at the core of quality learning for all students. Therefore, implementing reading comprehension through mobile applications is a viable solution.

Reading Comprehension

Pardede (2008) offers three theories of reading comprehension: bottom-up processing, top-down processing, and schema theory. First, bottom-up is a traditional approach focusing on habit reading, repetition, and correction. Readers match letters with sounds and make words. Word by word, they decode its meaning, link it into phrases and sentences, and, little by little, understand the written text. By adding meaning to words, readers understand information from a word to a sentence to an entire written text. It is an effective way for second language learners who are still novices with the few words they know, making it less overwhelming.

The second theory is the top-down process, called cognitive vision (Pardede, 2008). This theory focuses on the mind's innate ability to learn, the same ability that helps people acquire their first language. In other words, "reading is not just extracting meaning from a text, but a process of connecting the information in the text with the knowledge that the reader brings to the act of reading" (Pardede, 2008, p. 4). The reader's prior knowledge is vital in understanding the meaning of the content. It helps the reader make hypotheses, imagine what will happen, and confirm or reject theories for the text.

The third theory is the top-down process, or Schema Theory (Fernandez & Montero, 2005; Pardede, 2008). In this theory, readers use their prior knowledge to make sense of the added information. According to schema theory, the meaning of a text is not inherent or permanent; It depends on the understanding and thought process of the readers. On the one hand, the reader has his previous knowledge before reading a text. Then there is the content of the text, which can provide more capacity and improve reading comprehension by complementing the

prior knowledge that helps to understand. This process is more important for second language learning because students may have limited language knowledge as they begin to learn.

Schema theory processes involve a reader interpreting existing information and creating a schema within their mind. The student organizes the information and uses the correct schema to understand the new information. These outlines can be updated with added information acquired from the written text or what is learned in the classroom. Teachers can activate student outlines to develop their knowledge for the next reading. With this, students can stay motivated to continue learning quickly and with better quality (p. 37). This model suggests that no text can be generically complex or straightforward based on linguistic features such as syntactic complexity or word frequency (Novary Ngabut, 2015, p. 30).

Essential Elements for Reading Comprehension

According to Mayer's (1996) integration model of selection organizations (SOI), a reader must distinguish the central part, reorganize the selected information in the short-term memory, and create a similar overall concept. Finally, the student must connect the knowledge stored in the short-term memory and the previous knowledge stored in the long-term memory. Chang et al. (2010) describe common strategies used in preparation: decoding unfamiliar words, highlighting key points, summarizing, questioning, predicting, and clarifying. However, Ruys et al (2014) agrees that teaching reading strategies are hardly emphasized in classes, considering that the creation, familiarization, and proper implementation of teaching materials are demanding.

It should be noted because of all that goes into reaching a timely level in the reading process, where developing reading skills in a second language is often laborious, there are many things that teachers and students should consider when researching something to read. A list of

tips based on reading recommendations from Pardede (2008) includes strategies for all parts of the reading process: before, during, and after reading.

- *Teacher-directed reading*: The teacher approaches the task by introducing new vocabulary ideas and teaches the students the basics of vital information about a written text. By doing so, students have some familiarity with the text, which facilitates understanding and focusing on the general information and, consequently, the development of reading comprehension.
- *Interactive activities:* This is one of the most important for learning because it makes the class more interesting, keeping students' motivation high. It also helps to review previous and new knowledge so students do not forget what they are learning.
- *Reflective activities:* This approach is aimed at guiding students towards the goal of reading: asking themselves about the type of text and why they read it, and even becoming aware of the benefits it can bring, such as being better at reading in a second language.
- *Make selections:* Reading something that interests students helps them to be more motivated. If students select what they are reading for themselves, they are less likely to give up reading, even if it takes a long time.
- *To integrate* previous knowledge: It is always important to emphasize the importance of knowing the text before reading it so it is easier to understand. If not, students may become frustrated and give up reading.
- *Rereading: Reading* gets easier over time, so reading a second or third time helps increase comprehension of a text. Even when reading in the first language, rereading a text helps to notice something earlier.

- *Use of the context:* Even in a conversation, context helps understand unfamiliar words or words or phrases. Meaning also changes in context, so using it improves the thought process, allowing students to understand something logically.
- *Pause:* It is important to take breaks to analyze and acquire new information appropriately. Reading too much can be overwhelming and have the opposite effect, and the student does not learn anything. Each student has a different learning process; some are faster than others, and it is important to adapt to the proper learning process.
- *Monitoring:* Reviewing and evaluating what has been read to see how it was learned can help the student meet his objectives when the text has a certain difficulty level.
- *Group discussion:* A group discussion is a good activity that helps students understand other aspects of the text when they talk with their classmates. In addition, various activities can be carried out, such as writing about it, taking tests, and reading other material.
- *Motivation:* This might be the most important tip for learning. Without motivation, students will not desire to read; they will not focus on reading and learn nothing from it. Motivation can make a significant difference in doing something and doing it well.

The reading tips emphasize activities that reveal associativity processes that involve student participation in the learning process. Another relevant aspect is the technicality of the information and the means to promote it. Therefore, the promotion of strategies must be mediated by the educational needs of the students and the lesson plan that transforms the pedagogical practices. This way, integrating these tips to acquire reading skills can be enhanced using technology, which streamlines and facilitates these processes and increases motivation, a crucial aspect for a person to mobilize autonomous learning.

Reading competence is a process that requires the intentional and recursive participation of the teacher in promoting motivation and knowledge. Regarding student needs and teaching methods, the central aspects of innovation in education prevail with technology, didactics, and pedagogy. Therefore, the methods and contents are the most significant changes that should impact the teaching-learning process, additionally motivated by the context.

Reading Comprehension in Foreign Language Education

A good learning environment needs five things: motivation, accessibility, socialization opportunities, information exchange, and knowledge development (Salmón, 2000, cited by González, 2010). From a psycholinguistic perspective, reading is not a visual activity per se; instead, elements are usually described in the text and the reader's imagination (Novary Ngabut, 2015). Psycholinguists like Goodman (1996) do not see reading as decoding a written text. The reading is based on ideas derived from linguistics and psychology, making reading a complex information-processing skill that readers actively use while reading and coordinating various skills that facilitate comprehension. Teachers use activities to emphasize students' prior knowledge and build a strong foundation that makes reading more comfortable (Novary Ngabut, 2015).

Distance Learning with Technology

There are two important reasons to use distance learning with technology. The first reason is that technological devices have made education more accessible (Moran et al., 2021). Now students can learn anywhere, anytime, and find the information they need through the Internet. Consequently, students can learn outside the classroom using videos, apps, books, and more. The second reason is that the global pandemic pushed the majority of students around the

world to learn online, and these changes imposed the need for new teaching and learning methods (Pulido & Ancheta, 2021).

Distance learning focuses on methods that use technology, intending to teach more individually and engagingly for students who have grown up with technology today. For this paper, distance learning is considered an independent learning approach where students do self-study that the teacher controls, helping students when they do not know what to do, giving the required information, and motivating students (Gonzalez, 2010). Also, because this study discusses mobile technology applications, a distance learning method for individual learning, using this terminology seems appropriate.

Technology has changed the way people live. Education is one of them, bringing new methods and strategies to help students learn differently. Also, because technology is part of the work process, technology in schools helps build the ability to use technology as part of the curriculum. Buselic (2012) gives a list of advantages and disadvantages related to using technology for education.

Such advantages include providing information that students can use for a while and return if necessary. Information on the internet is diverse, making it easy to find needed information and improve and consolidate skills. The different methods that can be used with technology also help have more interactive classes. Students who are too shy to ask questions in class can use a chat to communicate. Another aspect is motivation; technology can give students a positive attitude to learning outside class hours.

In terms of the disadvantages, Buselic (2012) mentions that distance learning does not work like a traditional classroom, and teachers need to plan exciting ways to approach teaching and learning. Also, although some devices may be affordable in the long term, not everyone can

afford one, making it difficult for people with financial constraints. In a face-to-face situation, the teacher can help the student directly, but distance learning requires time to receive feedback by email or other means. Consequently, learning social skills is limited because everyone meets online, and students do not interact much with each other, which limits the interaction and communication of students to socialize.

Distance learning is a result of the influence of globalization, where technology contributed to the agility of communication processes to computer availability, where in the systematic structuring, education found the opportunity to integrate teaching with learning methodologies to obtain knowledge. Thus, mobile learning is also helping distance learning since almost everyone has adopted mobile devices as indispensable resources with a range of information processing functionality, comprehensiveness of the characteristics of a computer, ample storage, and an approach to interaction with the world.

Mobile Learning

One of the challenges facing the world today, especially for those who depend on constant interaction with people, is maintaining the same level of communication to achieve different purposes, namely personal, academic, professional, or financial. That explains why the use of technology, mobile applications, and the Internet has successfully become a human necessity for most daily activities. Giachetti (2013) points out that the transition of modern technologies is characterized by the rapid ability of a company to compete for new products in the technological market.

The use of mobile technologies is now a trend for different purposes, more specifically, to innovate with new products that meet the diverse needs of consumers. Kearney et al. (2019) describe mobile technology as devices whose main characteristics are portability and

connectivity. Obeidat et al. (2020) identify technological innovation as the advancement of new technologies and processes in the technology industry and also state that mobile technological innovation is continuously growing. “Mobile technologies are devices that include mobile phones, laptop computers or PDAs and have wireless connectivity and some software application that enables collaboration” (Wong et al., 2016).

Mobile technology continues to expand its horizons; for example, Obeidatet al. (2020) highlight some features of today’s mobile technology: wireless-enabled smartphones and tablets, mobile apps for sharing data, and banking apps for paying bills and transferring money to other accounts or accessing bank accounts. Also, the authors state that people who have these types of devices also “read books, play games, listen to music, use social networks or browse the Internet at any time” (p. 25).

Mobile Pedagogical Frameworks

Different models of conceptual frameworks have been designed to apply to mobile learning. Ozdamli (2012) points out that one of the pedagogical concerns of mobile learning is identifying ways to integrate mobile tools into learning and teaching practices. It focuses on four critical aspects of the pedagogical framework for mobile learning: integration of tools, pedagogical approaches, assessment techniques, and teacher training. Parsons et al. (2007) present a model for mobile learning with four perspectives that take into account the generic problems of the mobile environment, learning contexts, learning experiences, and learning objectives. Also, the framework by Vavoula and Sharples (2009) evaluates mobile learning considering a micro level that focuses on its use, a level regarding the reading of the learning experience in communication in context, and a macro level that contributes to organizational contexts. Considering the characteristics proposed by the other frameworks, which suggest a

learning experience mediated by mobile technology, Kearney et al. (2012) provide a concise framework that unifies the current features of mobile pedagogy within the sociocultural perception of mobile learning.

The iPAC framework measures and identifies the characteristics of mobile devices used in mobile learning. The three dimensions of this framework for mobile learning are personalization, authenticity, and collaboration (PAC), each with a corresponding sub-dimension: 1) for personalization, agency, and personalization; 2) for authenticity: context and task; and 3) for collaboration: conversation and co-creation (Kearney et al., 2012). The model intends to reflect the learning that occurs while using these devices and emphasizes the use of mobile learning while using mobile technology.

Personalization is based on motivational theory (Pintrich & Schunk, 1996) and sociocultural theory (Vygotsky, 1978). The crucial elements associated with personalization are learner choice, agency, self-regulation, and personalization (McLoughlin & Lee, 2008). Through this feature in mobile learning, students work on different activities in their own space and time. The type of activities students face allows them a sense of ownership. Commonly, these activities are customized by students with their devices (Traxler, 2007). Students also experience an advanced agency degree where they are autonomous in their learning content.

The second feature of the current framework regards authenticity. Kearney et al. (2012) define it as "... the extent to which tasks are realistic and offer problems encountered by professionals in the real world" (p. 9). They believe that the similarity between the student's practices and those achieved in their community or real context refers to a level of authenticity of the process. Kearney et al. (2012) state that task and process authenticity is involved in mobile learning practices, while students engage in simple tasks that involve real-world practice. The

final feature of the current mobile pedagogical framework is a collaborative core in sociocultural theory, where people negotiate meaning through conversation or dialogues (Vygotsky, 1978). Mobile learners, thus, collaborate by interacting with others mediated by mobile devices (Kearney et al., 2012).

It is important to examine two considerations in studying the prevailing framework here: time and space. Traditionally, formal learning takes place in physical settings and is commonly organized by periods such as schedules or semesters, which are stable (Traxler, 2009). Kearney et al. (2012) believe that virtual learning offers a wide range of possibilities concerning space due to virtual slots designed for mobile devices. Users can reschedule or rearrange time without causing effects on both sides of learning (Ling & Donner, 2009).

Mobile Learning in Education

The use of mobile technology within a classroom, known as mobile learning or m-learning, seems to meet the needs of 21st-century students (Ally & Tsinakos, 2014; Gerstein, 2013). Activities on mobile technology benefit students due to their interaction. Stevens and Kitchenham (2011) refer to mobile learning as "meaningful learning that occurs through the use of portable wireless devices such as cell phones, personal digital assistants, minicomputers, or iPods" (p. 3). Ally (2009) expresses that mobile learning is positioned as informal rather than formal. However, he acknowledges that mobile learning allows people to access information and knowledge instantly, more precisely within formal education; He argues that the relationship between education, society, and technology is more interactive.

Walker et al. (2020) mention that one of the advantages of mobile technology in a classroom is having mobile devices available, but teachers find there is not much time to use these devices inside the classroom. According to Traxler (2012), through mobile technology, it is

also possible to work on some areas of classroom activities that were not completed due to lack of time or opportunity. Mobile technology also positively impacts distance learning, which, in turn, is advantageous for students who do not have access to face-to-face classes (Walker et al., 2020).

According to Husbye and Elsener (2013), the second advantage is the BYOD model, where students can bring their own devices into the classroom. They highlight the usefulness of these objects in a school since they mediate the objectives established for the class and the materials used to achieve those goals. Research has shown that students receive positive effects when learning is mediated by technology.

Mobile learning encourages active learning by implementing situated, inquiry-based, or case-based learning strategies (Fox, 2019). As a result, students develop problem-solving and critical-thinking skills (Arokiasamy, 2017). Additionally, students work at their own pace using mobile learning and feel more confident in this learning environment (Granic et al., 2009).

Since students and educators face different challenges in teaching and learning, mobile learning should engage students, improving various aspects of learning. For example, an important consideration when designing content for mobile devices is that it should be accessible to the least advanced device (Wang & Shen, 2012). Students who are fascinated with mobile learning activities will likely enjoy working through the course activities and will target material that they find interesting (Arokiasamy, 2017). Also, students effortlessly adapt to what they use in their daily life regarding technologies, gadgets, and fast communication. As evidence, some interactive learning environments include eBooks, streaming videos, podcasts, social media, cloud computing, and many other mobile applications promoted by educators worldwide (Lim & Churchill, 2016).

Ally and Prieto (2014) refer to the current educational model as obsolete since it was developed before the trend of communications and technologies. Therefore, the current demands of education can be a reason to reformulate pedagogy and adapt practices to new requirements. Educators must rethink education and shift from older, more traditional methods to more frequent learning trends (Brown, 2005). Education must encompass the most contemporary demands of learning. Therefore, mobile learning can be beneficial in transforming pedagogy to accommodate new generations of learners due to their opportunity to use active learning strategies in their context, leading to successful learning outcomes (Cochrane, 2013; Stoerger, 2013).

The use of technology in learning makes it convenient for students to create their content (Traxler, 2009). In addition, they can use mobile devices in their learning community through real situations, and context-aware group learning and personalized learning are supported (Quinn, 2013; Traxler, 2010). However, teachers have a challenging task in this globalized world to engage students, especially when using mobile technology in their classes. Teacher educators must rethink how they prepare teachers for the technology-enhanced education system (Ally & Prieto-Blázquez, 2014).

Mobile Learning in Language Learning

Mobile learning applied to language learning can lead to high results regarding student engagement since one of the purposes of language learning is communication. Kukulska-Hulme (2006) affirms that collaborative learning is becoming mainstream. Since students are working on collaborative learning, they can communicate through their mobile devices while doing an organized task.

Yurdagül and Öz (2018) confirm that one of the advantages of mobile learning in foreign language learning is the Internet connection and the ease of any information by students at any time and anywhere. According to Ogato and Yano (2005), mobile technologies are suitable for language learning due to the actual context and situation in which the learning takes place. Additionally, some educational mobile app designers may be interested in foreign language learning, considering that L2 learners frequently search for information related to word meaning or conjugation/collocations (Yurdagül & Öz, 2018).

Other advantages of using mobile learning are "accessing documents or document libraries, accessing quizzes and self-assessments such as questions or games, participating in lessons and tutorials, receiving archived or live-streamed lectures, accessing video clips or audio libraries, reading the asynchronous posting, showcasing student work, participating in virtual learning communities on the go" (Hashemia et al., 2011, p. 2479). Furthermore, educational mobile apps and games are particularly efficient in foreign language teaching because they are no longer monotonous but more dynamic and collaborative. They challenge students' curiosity, control, recognition, competition, and cooperation, motivating learners while engaged in mobile learning (Kuimova et al., 2018).

Chkotua and Bingol (2018) focus on the functionality of mobile technologies in teaching and learning language skills and sub-skills. For example, they mention websites offering songs, podcasts, videos, or news to improve listening comprehension. Regarding grammar skills, some apps contain multiple-choice activities, true/false questions, fill-in-the-blanks, quizzes, games, and others that offer immediate feedback to students. Regarding speaking skills, they state that with mobile learning, students are in contact with and speak the target language. Students can also record their voices to test their pronunciation. In support of writing skills, the authors

mention using social networks, such as Facebook, Twitter, or Instagram, as powerful platforms to improve. Reading comprehension can be improved through applications, pdfs, news, or text messages and must also accompany exercises that assess the student's level of comprehension (Chkotua & Bingol, 2018). The authors propose that the course books be installed on the device for reading outside the classroom.

However, mobile technologies applied to language learning require some physical, pedagogical, and psychosocial considerations. Building on these aspects, Stockwell and Hubbard (2013) list ten principles associated with the implementation of mobile language learning:

- Principle 1: Mobile activities, devices, and tasks must consider two important aspects; the usefulness and limitations of the mobile device; and the usefulness and regulations of where the mobile device will be used, regardless of the target language (Herrington et al., 2009, Reinders & Hubbard, 2013).
- Principle 2: Restrict task overload and disruption in the learning context. These factors can trigger stress levels, increase errors, and minimize productivity.
- Principle 3: Encourage students to respect boundaries. Stockwell and Hubbard (2013) suggest frequent reminders to students; however, this can be overwhelming if they work on other tasks. Another strategy is to allow students to organize activities or events.
- Principle 4: Maintain equity (Elias, 2011; Herrington et al., 2009). Device usage, functionality, and connectivity should be considered among students.
- Principle 5: Consider a strategy for language learner differences. Consider things like visual acuity and manual dexterity for small keyboards.

- Principle 6: Be sensitive to students' use of language and culture when using their devices (Thorne, 2003). According to research, students may notice their devices as social objects rather than learning objects (Liu, 2013; Stockwell, 2010).
- Principle 7: Assign short, brief language learning activities, or break them into chunks.
- Principle 8: The functionality between technology and tasks must be correlated, illustrating the technology and context needed to fit the task and vice versa.
- Principle 9: Some students should receive training in using mobile devices for language learning.
- Principle 10: Motivational support should be provided to teachers and students in the classroom environment.

Use of Mobile Applications for Language Learning

Apps are software that people download from online stores like Google Play, App Store, and others. Some apps are free, and some have a fixed price, and these apps are categorized by gaming, entertainment, and education (Gangaiamaran and Pasupathi, 2017). Educational apps have many features inspired by games and drag apps to make learning more exciting and valuable. Harsha Sidana (2018) considers the applications convenient and accessible for students. Through the apps, students can connect with others, and each App has its system designer who manages usability, roles, team management, administration, and security issues.

Of all the features of mobile technology, apps are the most convenient for learning because there are so many of them, and learners need to find the one needed for the skill they want to improve. Gangaiamaran & Pasupathi (2017) categorized English learning apps according to the level of the learner: primary students, secondary students, and tertiary students.

- Primary students: This includes students at the beginning level who are more interactive and learning through games and interactive activities.
- High school students: Students still play games to learn, but they interact more with different skills (listening, speaking, reading, writing), and they can develop and go through tests to know their level.
- Tertiary students: High-level language students use these feature-rich apps to interact and study the language, from social media and chats to practice language usage to reading material with difficulty levels.

Choosing the right app can benefit students as the benefits include becoming more social, having edutainment available throughout the day, using leisure hours effectively, and having different learning modes available (Gangaiamaran & Pasupathi, 2017).

Mobile Learning for Reading Comprehension in English

Using mobile technologies by language learners can be a crucial strategy to help them work progressively on the reading strategies and activities that best suit their level and styles. Regarding improving reading comprehension, Marzban (2010) recognizes that mobile learning can provide numerous opportunities to access information. Some of these include creating opportunities for the student to process, improving and storing linguistic production, focusing on language use through authentic texts, and expanding opportunities to use the first language to support the curriculum and English learning. Also, they provide opportunities to be autonomous in their education and provide the opportunity to communicate in English using mail exchanges, virtual classrooms, or web page creation.

Goh and Kinshuk (2006) consider that mobile learning does not necessarily imply that students should be confined to an environment regularly associated with the actual reading.

Additionally, most of today's students access the Internet to read, text, or search for information. Marzban (2010) says best that mobile learning provides "access to culturally and linguistically diverse resources, access to innovative tools, to integrate language and curricular learning" (p. 4).

Literature Review

The following section describes different investigations regarding the use of mobile applications to learn a language and highlights research points in common with the present study, namely, the mobile applications most used by users, their impact on students, and the functionality of applications for learning a language.

Regarding the functionality of using PPPs, Carrillo et al. (2018) studied the use of mobile devices and the applications used in the subjects taught in foreign languages at the university level. Based on a descriptive research design, the participating sample was 86 students from the Faculty of Education of the University of Murcia. The results show that Apps are adequate tools for language learning, although they are not used in different educational, university, and non-university environments.

Martinez & Garcia (2017) researched mobile applications for teaching and learning human anatomy. To do this, they characterized ten free downloadable mobile applications. The analysis included both the technological characteristics and the anatomical content, and the learning processes proposed by the applications. The results showed that the technological designs presented high usability, but the two-dimensional images predominated and demonstrated a medium degree of realism. Most applications approached learning the functions of relation, nutrition, and reproduction and establishing links between structure and function.

Concerning the impact of the use of applications for English language learning, Segovia (2017) carried out a methodological analysis of the most popular and free applications for Android mobile devices to learn English, considering the development of the four best-known skills, such as speaking, listening, writing, and reading, while learning a language. The results described 6 Apps: *Duolingo, Hello Talk, English listening, Talk English Standard, and English Podcasts*. The variations of each one and characteristics regarding the development of linguistic aspects of a language were highlighted, and grammar, vocabulary, and pronunciation are taught directly, and according to the needs of each person, also grammar is taught based on the inductive method. The author determined that the teaching-learning process in the classroom is a communicative process between teacher-student that electronic devices can never replace since these are means that contribute to better language learning. The classroom teacher creates a healthy and motivating climate on the importance of oral communication, and this, at the same time, becomes a learning model for the pronunciation of the language.

In this same line of significant contributions to the use of technological means, Portilla (2020) sought to optimize the use of mobile devices in the learning environment (classroom), using a massively used instant messaging mobile application to strengthen the learning of English in the apprentices in the Agroindustrial Training Center “La Angostura,” of the National Learning Service SENA (Colombia). The application through the mobile device was evaluated through Koole’s FRAME model and Quinn’s device capabilities or 4 C. With the results, they observed that learning English can be strengthened, motivates autonomous work, encourages collaborative work, and improves digital competence. Finally, mobile learning is characterized because “the student will develop their cognitive abilities through interaction, having the technology and tools it provides as support” (Gómez, 2015).

In this same dynamic of strategies they devise to develop together in the classroom, Husbye and Elsener (2013) relate the strategy of the BYOD model, where students can bring their own devices to the classroom. They emphasize the usefulness of these objects in a school as they mediate the objectives set for the class and the materials used to achieve those objectives. Research has shown that students receive positive effects when learning is mediated by technology.

In the case of functional points of mobile applications, Garrido (2022) reviews the literature regarding the use of mobile applications and how they contribute to the development of the oral production of a foreign language. Through the bibliographic review, the author determined that mobile applications contribute to the development of the oral production of a foreign language. The activities to be carried out in a foreign language class must be suitable, thus reaching the students' interest.

Regarding Information and Communication technologies to facilitate daily activities, including an educational aspect, García and Mesa (2019) researched digital generations and mobile applications for educational reinforcement. The results showed that the mobile device most used by the students is the Smartphone. 100% of the participants used social networks and instant messaging applications, and only 2% used educational applications. On average, these people spend 3 to 6 hours daily using applications, and more than half access the Internet at home. Half of those surveyed spent between 50 and 100 pesos monthly on mobile devices. The authors affirmed that students would use a mobile application as educational reinforcement, emphasizing that said application would be free.

From all of the above, it can be concluded that the development of mobile applications to support and reinforce academic knowledge in students would be well accepted since digital

generations spend more time with their mobile devices and want to get the most out of the virtual world that is increasingly passing.

Chapter 3. Method

In any research process, a line of study is chosen that allows the researcher to understand the reality of interest and thus generates a new perspective of knowledge. In this dynamic, it is possible "to be guided by a research paradigm, considering that there are multiple realities, which from any context is, a model being essential to be located in the actual context, interpret and respond to problems that arise in scientific work" (Gonzales 2003, cited in Ticona et al. 2020). This research is developed from the interpretative paradigm, the basic idea of constructing knowledge from the meanings given by interests, preferences, and expectations. This paradigm elaborates concepts, models, and schemes to give meaning to the experience.

The qualitative approach works best in making people's experiences explicit. This way, the researcher understands issues based on the participants' perspectives in their daily environment. According to Fernández and Baptista (2014), the qualitative approach is selected when the purpose is to examine how individuals perceive and experience the phenomena that surround them, delving into their points of view, interpretations, and meanings (p. 358).

Research Design

This study focuses on the search for available and applicable information, scientifically established knowledge, and processes, such as technological advances, methods, and techniques. According to Casares Hernández et al. (1995), cited by Bernal (2014), documentary research depends fundamentally on the information obtained or consulted in documents. In this way, the method that guides the state is critical, characterized according to Ricoy (2006), as cited in Ramos (2015), in which the search for social transformation is based on participation, intervention, and collaboration from a critical personal reflection in action. This research is based on a social opportunity, evidenced in the context of digital media, validating its applicability to

the interests and needs of the population targeted by this study. A questionnaire was used for student participants to confer their use of applications provided on the various cellphone platforms.

Context and Participants

The documentary data for understanding the functionality of the mobile applications were collected from the *Google Play* application store, which describes the characteristics of the applications in terms of functionality and purpose. These apps provide individualized learning through mobile devices or a computer browser, and the apps are staggered and mostly retain the user's personalized progress. Ninety-four students taking English as a foreign language at the university level also participated in the study.

Data Collection Techniques and Instruments

Most of the data will be general information about mobile apps, their use for reading comprehension, and their benefits to students. Additionally, a multiple-choice survey is included for further research support, consisting of 8 questions, providing student perspectives on the use of the apps. The selection of applications was focused on the ranking, the place where it can be found (*Google Play*), the prices, or other aspects that mobile applications may have, but on analyzing and evaluating these mobile applications used for understanding the reader. The criteria for this study considered the recommendations of Chakravarthy (2020), Klimova and Zamborova (2020), and Tomlinson (2010). These include:

- Only the analysis and description of the application are included.
- Focus on mobile applications to develop reading comprehension in learning second languages.
- Use of articles, blogs, and reviews about the applications.

- Appropriate activities, tests, and material in English should help students understand reading comprehension skills.
- Apps should improve reading skills, language comprehension, and reading comprehension (code cracking, text engagement, text usage, and text analysis).

Procedure

The activities developed to answer the research question discriminates data collection, interpretation, and analysis of information. Initially, for collecting the information described above, the selection was made according to the selection criteria in reading mobile compression applications for the English language, which were consulted in the *Google Play* store. Students were sent the survey via email.

Data Analysis

The information on different mobile applications for reading comprehension and usability was analyzed to determine whether these mobile applications help students meet their learning objectives (Metruk, 2021). By doing a backward search of the different applications for English and their use, level and popularity were evaluated. Beavers et al. (2013) explain that analytical procedures are methods used to examine the relationships of observed variables and measure them through questions, observation, and evaluations. Variations in the process allow for the purpose and theory to be accommodated in the research results. With this flexibility, the investigator must refine the analysis until significant results are reached and evaluated (Beavers et al., 2013).

The information was tabulated in analysis tables, in which some categories were defined to show the main findings of the source review immersion process. Then using inferential interpretative of written information, detailed qualitative results were listed, and intersections

with the perspective of the study phenomenon's reality and the participants' opinions were discussed.

Ethical Considerations

Participants were notified of the purpose of the research study and that this investigation was considered risk-free. The participants also were notified in writing that their information would be kept confidential and anonymity retained. All participants agreed to participate in the study.

Chapter 4. Findings

In this chapter, an analysis of mobile applications selected for the study will be made to comply with the achievement of the objectives set out in the research. They will be analyzed through the interpretation of the comparative tables and by competences, skills of the applications, utilities, learning methodologies, cost, time, and in general, all the characteristics each app can provide.

Applications

Table 1 details the seven most common mobile applications used by children, adolescents, and adults. The table includes the name of the application reviewed, the type of operating system used, the skill it develops, the teaching process, academic achievement, and whether the service was free. The applications generally have very similar characteristics, such as the interaction between the application and the user, multi-thematic, grammar, vocabulary, and reading comprehension, some with audio. The applications for reading comprehension chosen for this study are the following:

Duolingo is a level progress app for language learning where students unlock a new lesson or level by doing the previous lesson. Teach students vocabulary and grammatical structure. Gradually, as the student levels up, grammar and activities become more complex, developing the four necessary language skills. Likewise, *Wlingua* is a project created to facilitate the teaching and learning of English. It is an app for Windows, Android, and iOS, which allows teachers to monitor students' progress as they take lessons from the course it contains, lessons that can supplement the class or be sent as assignments outside the classroom.

Another app for language learning is *Beelinguapp* which uses e-books for language learning by offering students a broad category of books to read. It is considered the best for

practicing reading where a person can have two different languages side by side and check their language when it is difficult to understand. In addition, it has a karaoke-style text so students can read along it. A typical application for gaming is *Knudge.me*. It is an application with two parts: the lesson and the games. In the lessons, students learn about all language skills: listening, vocabulary, literature, and writing. It is suitable for practice before an exam and has flashcards and tests.

There are multiple applications for reading comprehension. *English Reading Test – 2019* is an application for students to acquire vocabulary, grammar, and texts. Based on their scores, students can be rewarded in the app creating a competitive environment for students. The reading material is created in the form of quizzes where students have to describe words or phrases and understand the perspective of the text. *IELTS Reading* is an application to improve reading skills made from the point of view of IELTS (International English Language Testing System), the world's most standard English text for higher education. This app has many tips and strategies for reading more efficiently and developing an awareness of the meanings of the text.

The TOEFL Reading also is used to practice the TOEFL (Test of English as a Foreign Language), especially the reading part. This app has exercises for reading comprehension and a simulation test. The student learns to understand the way a text is organized. In addition, students should find the concept in a paragraph, the main idea, the main points of the story, and how they connect. Finally, the *English Reading Comprehension* provides help for the TOEFL and the TOEIC (Test of English for International Communication). With different categories of reading comprehension, the material is divided by level, each with other lessons. Students can take multiple-choice quizzes to earn points for reading the following text (Chakravarthy, 2020).

All the studied applications are available for use through cell phones and in all stores for mobile applications (Google play and app store). It should be noted that *Duolingo and Wlingua* can be accessed through a personal computer. Additionally, all have a free version, except for Beelinguapp, which only has a subscription service option. The *Duolingo, Wilingua, Knudge.me,* and *IELTS* applications offer free and paid subscription possibilities.

The app's interactivity allows the student to increase their vocabulary knowledge and, in turn, strengthen listening, writing, spelling, and grammar. This translates into a pillar of comprehension since the practical part complements the activity where the student participates in pronunciation, sentence construction, contextualization, and listening practice to recognize words or phrases. Regarding learning skills, 87% of applications help users strengthen their ability to write and read, and the other 13% only focus their methodology on the ability to read. It is observed that within the application groups, *Duolingo, Wlingua,* and *Beelinguapp* develop various strategies to develop reading comprehension and allow the personalization of learning according to the user and the level of English proficiency with a preliminary assessment to establish the level of the student. The *Knudge.me* app is for people who have already learned the English language and want to strengthen their knowledge and practices at a medium-high level. The *English Reading Comprehension* app has game features where players test their comprehension skills at different levels.

Table 1

Features of Existing Mobile Reading Comprehension Apps

Name	System	Competences	Teaching And Learning Process	Academic Performance	Paid/Free
Duolingo	Android Windows Phone, PC internet browser.	Writing and reading	It offers classified lessons in multiple languages and builds the mood to move forward. Shows progress –levels graphically and strengths.	Improves oral and reading comprehension with short story dynamics with audio and voice interaction (pronunciation).	Free and a premium version
Wlingua	Android, PC internet browser.	Writing and reading ability	By levels – grammar – knowledge assessment – interaction with the App.	Writing analysis process and text syntax. Conversational – audio – listening comprehension – pronunciation	Free and a premium version
Beelinguapp	Android	Reading and listening skills	Interactivity between reading, with pronunciation. Audiobooks Parallel texts Native-speaking narrations	Maximizes pronunciation and listening learning while understanding reading. Improves language skills.	Subscription service
Knudge.me	Android	Reading skills	Uses well-designed lessons and games	Improves English vocabulary and grammar.	Free and a premium version
IELTS reading	Android	Reading ability, suitable for exam practice	Evaluation. Verification of knowledge through the application of tests.	App based on the evaluation of the acquired knowledge by levels. Used for knowledge tests.	Free and a premium version
English Reading Test – 2019	Android	Reading ability, suitable for exam practice	By levels – grammar – knowledge assessment – interaction with the APP.	Learning through evaluations of competencies, categorized by syntax and themes for a more significant consolidation according to the taste of the student.	Free
English Reading Comprehension	Android	Reading ability, suitable for exam practice	Lessons by grades and level. Grammar and comprehension	Interaction with the application, verification of knowledge.	Free

Table 2 details how the use of mobile applications promotes the acquisition of reading comprehension skills, including semantic, syntactic, and pragmatic skills. It is evident that the characteristics of the components that guarantee reading comprehension are very similar between the applications, considering the objective; however, each uses different playful pedagogical strategies to make it more attractive, but at the same time, more effective in learning. Each app also focuses on increasing vocabulary, which provides a higher level of understanding while studying or facing work, personal, professional, or educational situations.

In the case of the syntactic component, in reading comprehension, the applications teach the organization of words, sentences, and paragraphs, in such a way that they have a sense and meaning accordingly. From Table 2, all the apps strengthen the reading comprehension process by constructing sentences with different dynamics, such as true and false questions, organizing words to build an idea, and selecting the correct word according to the idea, among others.

The pragmatic process, which is the integrative process of the syntactic and semantic components, goes to the experience and practice of the language. The main objective of reading comprehension is to discover the implicit, hidden, or equivocal senses when transmitting or understanding a text. In this aspect, only 57% of the applications carry out this process with the student (*Duolingo, Wlingua, Beelinguapp, and Knudge.me).* It is worth mentioning that the applications present functional interaction as a methodology for language study, and in that aspect, the pragmatic objective is met. However, they are not of great help, for the reading comprehension process, by only giving a result measuring the level of general knowledge of the topics or proposed exercises.

Therefore, it can be said that these applications integrate and structure those components that ultimately contribute to strengthening reading comprehension. According to the application's learning dynamics and design, the *Duolingo, Wlingua,* and *Beelinguapp* applications stand out.

Table 2

Components of reading comprehension with existing mobile applications

Description of Mobile Applications		**Components of Reading Comprehension**		
App	***Academic Performance***	***Semantic***	***Syntactic***	***Pragmatic***
Duolingo	Oral comprehension, reading, and vocabulary.	Building Meaningful Sentences Identification of words with sound.	Identify the constituent elements of the sentence so that the student recognizes the importance of organizing words with meaning and coherence	Attention to the process of signification and communication. Interaction between the platform and the student.
Wlingua	Writing analysis process and text syntax. Conversational – audio – listening comprehension – pronunciation	Building Meaningful Sentences Identification of words with sound.	Organization of words with meaning and coherence. Recognition of the elements of the sentence. Instructs how words are built and organized to give them logical order and meaning.	Interaction between the platform and the student in the written and listening processes.
Beelinguapp	Pronunciation and listening comprehension, and writing	Vocabulary acquisition and identification of keywords, grammar, and consistency.	Organization of phrases and words, with emphasis on the use of native terminology.	Abstraction, deduction, induction, analysis, comparison. Level of reflection based on a dialogue attitude in interaction with the platform.
Knudge.me	Vocabulary and grammar	Strengthen vocabulary, learning the different uses of words in constructing sentences.	Use of words. Classification of vocabulary according to its meaning and comprehension.	Recognition of the sociolinguistic code.
IELTS reading	Acquisition and evaluation of knowledge. Certification.	Strengthen vocabulary through reading	Use of tools for grammar and sentence construction.	Interactive practice for knowledge assessment.
English Reading Test – 2019	Writing and text syntax	Text comprehension through writing Vocabulary strengthening	Coherence for the construction of sentences.	Question evaluations with the interpretation of texts.
English Reading comprehension	Grammar and comprehension	Text comprehension through writing Vocabulary strengthening	Coherence for the construction of sentences.	Question evaluations with the interpretation of texts.

Table 3 compiles a synthesis of relevant positive and negative reviews of user experiences, ratings (scale of 1 to 5), and age ratings. It can be reflected that the results of the user ratings are between 4.0 and 5.0, so it can be inferred that the apps are very good, mainly the *IELTS* application obtains the maximum rating granted by the *Google Play* store. *Duolingo, Wlingua,* and *Beelinguapp* have the highest number of downloads and comments, which can be interpreted as the most used and accepted by the users. The *IELTS Reading* application is the best qualified for improving reading and with-it critical reading and comprehension. From this, it is inferred that they are complete applications and that, integrally, they present benefits both for learning the language and for the process under study, which is reading comprehension.

Among the positive opinions and comments, it can be understood that the applications comply with the characteristics on which their functionality is based. The applications are interactive, motivating, leveling, and evaluative to measure each user's progress. These applications use different strategies and themes so that each user can interact appropriately according to their type of learning, prioritizing reading comprehension in a place with the chosen language. The comments and opinions, in general, comment on the dynamics of the applications where users express their agreement with the methodology, interaction strategies, study topics, personal growth, and tastes for the platform or design of the application as such. Also, they tended to identify with paid applications' content and motivational characteristics. The negative opinions included limiting the user or not having more significant interaction with the app. This, in turn, made users want greater access to the content, more activities, more significant learning progress, and better dynamics for strengthening reading comprehension.

Table 3

Ratings and Opinions of Mobile Applications

App	Number of Comments	Ratings	Public of Interest	Positive Reviews (5 stars)	Negative Reviews (2-1 star)
Duolingo	13,286,943	4.8	Suitable for all audiences	Challenges, prizes, stimulation, and fun	Lowered the amount of experience. Demotivates the Life System.
Wlingua	381,570	4.7	Suitable for all audiences	Didactic, moldable to the user in terms of the level of learning. Easy, intuitive, and fast.	The images do not help because they are just atmosphere and become distracting.
Beelinguapp	67.9 thousand	4.6	Suitable for all audiences	I improved my reading comprehension and learned thousands of words in English Easy to use Exactly what I was looking for, considering that reading and listening improve language learning.	Requires some knowledge of the language The audio was not heard very well I have already read almost all the reading challenges, and it always ALWAYS returns me to quizzes that I have already done more than twice with questions that I have already answered correctly.
Knudge.me	53,968	4.6	For ages 10+	It's simple and does the job, I love it. It's an entertaining, fluid, complete and functional app, 100% recommended. Ideal for those of us who manage the upper intermediate level of English, I like games and activities. Practical and useful to acquire vocabulary.	People who already speak English and want to improve their level in the language. The App isn't practical when learning vocabulary Not suitable for beginners
IELTS reading	1,602	5.0	Suitable for all audiences	This App is fantastic. Excellent I like it a lot; it has many interesting texts to read and a question structure like the IELTS reading test.	has no negative reviews
English Reading Test – 2019	1,614	4.1	Suitable for all audiences	Excellent App Practice written comprehension. I think it's excellent not just to read for the sake of reading but to understand what is being read.	Lots of publicity. It's very difficult, and requires some knowledge

Note: Analysis of the ratings and opinions of mobile applications among users who take English as a foreign language (Google Play).

Student Experiences

Regarding the first question, 85% of the population used a mobile app to learn English, and 80% reported using the Duolingo app. The others have used applications without significant trends. It should be noted that Duolingo has agreements with educational institutions to be the digital platform for the language educational strategy, as is the case of the Instituto Tecnico De Soledad Atlantico (ITSA, 2017).

When asked why participants used the apps for language learning, 36% of students stated that the most significant benefit's learning vocabulary, followed by strengthening grammar (26%). 24% of the students believe that they have strengthened their listening comprehension, and 14% of the participants consider that reading comprehension is their greatest benefit, demonstrating that the option of selecting an application is to improve several aspects but not to learn inclusively.

Students selected the free version over the paid or premium services (97%). The reasons provided included that they did not consider it necessary to buy the premium version (49%), not having money (43%), lack of time (13%), and not trusting the content provided (13%). When asked if they would pay for the premium version, 71% of the participants answered negatively. One possible reason could be that almost all the participants are paying for their second language studies in institutions with academic recognition, quality teaching, and excellent and qualified teachers. Therefore, it does not make sense that investing in language applications is feasible.

When asked what could be improved with the apps, 28% of participants commented that apps should be more dynamic, suggesting better content, different strategies, more themes, and easier platform management. 10% of the participants felt that the App should improve grammar, and 19% did not make suggestions.

Chapter 5. Discussion

Mobile applications and English reading comprehension result as categories of this study, which aims to determine the app's functionality for learning. The interest in addressing this topic lies in deepening knowledge about the categories, using primary and secondary sources, and doing an experimental study with students studying English. For the definition of the problem of this research, part of the assumption is that the rise of technology has brought the approach of knowledge through the use of technological means based on digital platforms, programs, Internet pages, social networks, and mobile applications.

Concerning the use of mobile devices for learning a language, there is the ease of accessibility to this methodology because the ease of having access to the Internet on a device is effortless today, and are in the market multiple applications, free and available, for any user. Consequently, mobile applications for reading comprehension have characterized the competence to be developed, the teaching and learning process, academic performance, and whether it is a paid or free version. At a general level, the applications used in the study in terms of academic achievement found that all the applications work on reading ability and that only 30% have reading, writing, and listening skills. Concerning this competence category and correlating it with reading comprehension, those applications do not comprehensively correlate with the student’s present difficulties as they are not by levels, and they are not dynamic, making interest in using said app even more difficult.

Coinciding with Fernandez and Montero (2005), the meaning of a text is not inherent or permanent; it depends on the comprehension and thought process of the readers. Learners need academic follow-up so that their linguistic level is increased, arouses motivation and individual interest, gives feedback to the student, and demonstrates progress. This suggests that the apps

mostly lack the personalization of teaching, which makes the proposed objective difficult. In simpler terms, an application does not know how and at what level knowledge grows. It does not know the student's learning capacity; on the contrary, the application is intuitive. It advances in a pre-designed way with topics and situations far from the user's interest and independently.

As mentioned by Gonzalez (2010), citing Salmon (2000), the correct environment for teaching and learning and the correct development of knowledge is given by motivation, accessibility, socialization opportunities, and information exchange and knowledge development. Interrelating the above with the apps, they will not recognize the exchange of information and knowledge development. This is mainly supported because language is primarily social and stimulating and responds to communication. It should be noted that autonomous learning processes are self-motivated in space and time, according to Vygotsky (1978). With this, it is evident that the progress in knowledge will depend not on the app but on the student and the goal or objective of learning English.

Regarding the critical components of reading comprehension (semantics, syntactic, and pragmatics), it was found that the structure of the applications has, in its methodological construction and learning as well as the critical components. However, the *Duolingo*, *Beelinguapp*, and *Wlingua* applications have greater strategies to teach and comprehend English through their design of strategies for reading comprehension, integrating interaction, and evaluation of knowledge, although with the limitation that the approaches do not integrate all areas of learning. Kukulska-Hulme (2006) affirms that collaborative learning, which is related to mobile learning, participation is encouraged to work from any device the student has, and this is directly related to learning through the apps. What is different is that the methodology of the

selected does not include, contemplate, or evaluate the interaction with other platforms, such as social networks, podcasts, and videos, among others, on the network.

The analysis of the ratings and opinions of the mobile applications found that in the number of downloads of the apps, the one with the best reception is *Duolingo*, without saying that the others also have a good number of downloads. Regarding the comments on the acceptance rating, apps with outstanding ratings on average have been obtained. This allows the analysis of the methodology and learning strategy to define that the application is functional and provides user confidence. In the same way, they tend to reference motivational characteristics of the applications that can only be accessed in premium mode, which arouses various criteria in the population. In addition, the apps provide a better experience to the user.

The survey results corroborated the previously related issues, where 97% of students would not pay for the premium version because they do not consider it necessary. However, even though the L2 students know those benefits, they decided not to use the application in a paid mode, thinking and reaffirming that the methodology provided by their language classes is sufficient for learning English. They also distrust, disbelief, and lack interest in using the apps. The apps do not represent an effective mechanism for language learning. Additionally, it can be understood that these students have different expectations. Having selected the face-to-face methodology, having previous knowledge, not finding social interaction, and being unable to reach the native language, they ruled out using apps as a learning medium.

Chapter 6. Conclusion

This study was designed based on the problems among English students and how using digital technology in learning could help their reading comprehension. This led to defining the research's primary goal, which is to determine the functionality of mobile applications to improve reading comprehension skills in L2 students. For this, three objectives were proposed: to categorize the characteristics of existing mobile reading comprehension applications, compare the critical components of reading comprehension with existing mobile applications, and analyze the perceptions of mobile apps among English language students. Hence, evaluating these criteria, and based on the experiences of multiple users, led to positive conclusions in the research development.

From the analysis, it was possible to identify what type of process the apps focused on and determine its function. It was also possible to demonstrate activities, advances, and dynamics of questions that helped differentiate the applications from each other according to their maximum efficiency. By comparing the critical components of reading comprehension with existing mobile applications, the analysis prioritized the most valuable applications, which agreed with the most used and, in turn, the best-known in the population. Finally, the evaluations and opinions of the mobile applications among users who take English as a foreign language evidenced that the best apps focus on tastes, knowledge, and usefulness.

Additionally, within the findings, paid or free applications do not guarantee learning; payment only enables the application's content, but it will depend on the app's user. In the same way, in case of reaching achievements, the applications do not certify any level of English under any international qualification body, limiting the selection of these applications to recreational use and entertainment. The mobile applications demonstrated limitations because they do not

provide follow-up to the student, which somehow releases the user's responsibility. An educational institution would better meet the objectives and advancement.

Within the analysis, there is a correlation between the results obtained regarding the characterization of the test categories and the student's knowledge about the existence and use of the apps. They converged in that the *Duolingo, Wlingua*, and *Beelinguapp* applications, which were the most complete in terms of the teaching and learning process, and academic performance, were also the most recognized by the population, which should motivate the student to continue using the applications, and in a later period, evaluate how it has impacted the development of English.

It should be considered that applications must continue growing as a tool for learning English. However, these apps must evolve, allowing students to interact with other users, in chat rooms, online classes with the student's participation, and evaluations with native teachers, among others. In the same way, the apps must include all those interests that are of particular interest to that user and be shaped according to the knowledge users want to receive.

Limitations

The first limitation of the study was that the population of university students was compared to a selected population of app users to establish a unique behavior in the use of the apps for the reading comprehension process. The results cannot be generalized. On the other hand, the learning process of the apps is autonomous, and personal follow-up and not being guided or supervised by a tutor hinder the process of increasing the student's knowledge. With this, it is also clear that the student needs significant individual commitment so that the applications contribute to the reading comprehension process. The final limitation is that the

study included mobile applications solely for reading comprehension, excluding other apps and other alternatives for using mobile and technological devices.

Suggestions for Future Research

When evaluating the process of reading comprehension level, it is essential to validate concepts of critical components, perhaps the most important from knowledge, and the importance of new technologies for learning and skills development. For future research, it is vital to validate the applications used by the target population and not by the functionality of the applications. This will serve to clarify the reality that an institute manifests. Also, it is important to have a panorama of the country based on social and economic situations.

References

Ahmed, S. y Parsons, D. (2013). Abductive science inquiry using mobile devices in the classroom. Computers & Education, 63, 62-72. https://doi.org/10.1016/j.compedu.2012.11.017

Ally, M. & Samaka, M. (2013). *Open educational resources and mobile technology to narrow the learning divide.* Retrieved from https://doi.org/10.19173/irrodl.v14i2.1530

Ally, M. (2009). Current state of mobile learning. In M. Ally (Ed.), *Mobile learning: transforming the delivery of education and training* (pp. 9-24). Edmonton: AU Press. https://books.google.es/books?

Ally, M. y Tsinakos, A. (Eds.) (2014). Increasing Access through Mobile Learning. Vancouver, BC: Commonwealth of Learning Press. https://doi.org/10.56059/11599/558

Ally, M., & Prieto-Blázquez, J. (2014). What is the future of mobile learning in education? *RUSC*, *11*(1), 142-151. https://doi.org/10.7238/rusc.v11i1.2033

Ally, M., & Tsinakos, A. (2014). Introduction: Enhancing access to education with mobile learning. In M.Ally & A.Tsinakos (Eds.), *Increasing access through mobile learning* (pp. 1–4). Vancouver, BC: Commonwealth of Learning and Athabasca University. http://hdl.handle.net/11599/703

Arokiasamy, A.R. (2017). A systematic review approach of mobile technology adoption in higher education. *Economics, Management and Sustainability*, *2*(2), 48 55.

Beavers, A. S., Lounsbury, J. W., Richards, J. K., Huck, S. W., & Skolits, G. J. (2013). Practical Considerations for Using Exploratory Factor Analysis in Educational Research. *Practical Assessment. Research, and Evaluation, 18* (6), 1-13. https://doi.org/10.7275/qv2q-rk76

Bernal, M., & Bernal, P. (2020). Using reading to teach English as a foreign language. *MASKANA, 11* (2), 18-26. https://dialnet.unirioja.es/servlet/articulo?codigo=7696618

Brantes Ferreira, J., Zanela Klein, A., Freitas, A. y Schlemmer, E. (2013). Aprendizaje móvil: definición, usos y desafíos. https://doi.org/10.1108/S2044-9968(2013)000006D005

Brenda. (2019, 11 07). *Oxfordhouse Language Courses*. Retrieved 05 17, 2022, from 8 of the Best Apps for Learning English: https://oxfordhousebcn.com/en/8-of-the-best-apps-for-learning-english/

Brown, J. S. (2005). *New learning environments for the 21st century*. Retrieved from www.johnseelybrown.com/newlearning.pdf

Buselic, M. (2012). Distance Learning - concepts and contributions. *Oeconomica Jadertina* , 23-34. https://hrcak.srce.hr/83575

Cárdenas Reyes, Y. M. (2017).The teaching of foreign languages in higher education in the post-conflict situation. https://ciencia.lasalle.edu.co/cgi/viewcontent.cgi?article=2120&context=ruls

Carrillo-García, ME, Cascales-Martínez, A., & Valero, AL (2018). Apps for language learning at the University of Murcia. Distance Education Magazine (RED), (58).https://revistas.um.es/red/article/view/351511

Chakravarthy, K. C. (2020). An Exploration of Mobile Apps to Enhance the Feasibility of Mobile Learning in Engineering Students for English Reading Skills. *Journal of Xi'an University of Architecture and Technology, 7* (4), 2436-2445. https://www.researchgate.net/publication/340807926

Chang, K., Lan, Y., Chang, C., & Sung, Y. (2010). Mobile-device-supported strategy for Chinese reading comprehension. *Innovations in Education and Teaching International,* 47(1), 69-84. https://doi.org/10.1080/14703290903525853

Chkotua, M., & Bingol, M. A. (2018). Teacher views on mobile language learning. *International Journal of Social Sciences & Educational Studies*, *5*(1), 230-237. http://ezproxy.uninorte.edu.co:2084/10.23918/ijsses.v5i1p230

Ciampa, K. (2014). Learning in a mobile age: An investigation of student motivation. *Journal of Computer Assisted Learning*, 30(1), 82-96. https://doi.org/10.1111/jcal.12036

Cochrane, T. (2013). M-Learning as a catalyst for pedagogical change. In Z. L. Berge & L. Y. Muilenburg (Eds.), *Handbook of mobile learning*. New York, NY: Routledge. https://www.wojde.org/FileUpload/bs295854/File/09br_54.pdf

De Mejía, AM (2006). Bilingual education in Colombia: Towards a recognition of languages, cultures and identities. Colombian Journal of Applied Linguistic, (8), 152-168. https://www.redalyc.org/pdf/3057/305726654008.pdf

del Toro, Z. P., Mercado, A. C., Manjarres, M. P., Noriega, L. F., Watts, W., & Sanchez, M. L. (2019). Challenges in English Teaching and Learning in Colombia. *English Language Teaching, 12* (4), 57-61. https://eric.ed.gov/?id=EJ1210470

Elias, T. (2011). Universal instructional design principles for mobile learning. *International Environments*, 24(2), 273-276, https://doi.org/10.19173/irrodl.v12i2.965

Fernadez A, M., & Montero, S. (2005). La lectura en segundas lenguas: análisis de la efectividad de la contextualización previa y sus implicaciones metodológicas. *Porta Lingurarum* , 35-44. http://hdl.handle.net/2183/8244

Fox, E. (2019). Mobile technology: A tool to increase global competency among higher education students. *International Review of Research in Open and Distributed Learning.* 20:2, 242-259. https://doi.org/10.19173/irrodl.v20i2.3961

Gangaiamaran, R., & Pasupathi, M. (2017). Review on Use of Mobile Apps for Language Learning. *International Journal of Applied Engineering Research, 12* (21), 11242-11251. http://www.ripublication.com/ijaer17/ijaerv12n21_102.pdf

García, I. C., & Mesa, M. L. C. (2019). Las generaciones digitales y las aplicaciones móviles como refuerzo educativo. Revista Metropolitana de Ciencias Aplicadas, 2(1), 25-31. http://remca.umet.edu.ec/index.php/REMCA/article/view/77/180

Garrido, S. (2022). Mobile applications in the development of the oral production of a foreign language. [Titration work modality Research Project prior to obtaining the degree of Bachelor of Science in Education, Mention: Plurilingual]. ECU. http://www.dspace.uce.edu.ec/handle/25000/28093

Giachetti, C. (2013). New technology imitation: Who is copied more quickly? *Competitive dynamics in the mobile phone industry* (pp. 93-94). Palgrave Pivot, London https://link.springer.com/chapter/10.1057/9781137374127_5

Goh, T., & Kinshuk, D. (2006). Getting ready for mobile learning adaptation perspective. *Journal of Educational Multimedia and Hypermedia*, 15(2), 175-198. https://www.learntechlib.org/p/6179/

Gómez, M. A. (2015). *Aplicación para dispositivos moviles para el aprendizaje del inglés como segunda lengua para niños de prescolar.* Bogota, D.C.: Universidad Distrital Francisco Jose de Caldas Facultad Tecnologica. http://hdl.handle.net/11349/4374

González, A. (2010). English and English teaching in Colombia: Tensions and possibilities in expanding circle. *Template Royal*, 332-351. https://www.taylorfrancis.com/chapters/edit/10.4324/9780203849323-30/english-english-teaching-colombia-tensions-possibilities-expanding-circle-adriana-gonz%C3%A1lez

Hashemia, M., Azizinezhad, A., Najafia, N., & Nesari, A.J. (2011). What is mobile learning? Challenges and capabilities. *Procedia - Social and Behavioral Sciences*. 30, 2477 – 2481. https://doi:10.1016/j.sbspro.2011.10.483

Herrington, A. Herrington, J. & Mantei, J. (2009). Design principles for mobile learning. In J. Herrington, A. Herrington, J. Mantei, I. Olney & B. Ferry (Eds.), *New technologies, new pedagogies*: *Mobile learning in higher education* (pp. 129-138). Wollongong: University of Wollongong. Retrieved from http://ro.uow.edu.au.

Husbye, N.E., & Elsener, A.A. (2013). To move forward, we must be mobile. *Journal of Digital Learning in Teacher Education*. 30(2), 46-51 https://doi.org/10.1080/21532974.2013.10784726

International Telecommunication Union. (2016). ICT facts and figures. Retrieved from http://www.itu.int/en/ITU-D/Statistics/Pages/facts/default.aspxInternational

ITSA (May 3, 2017), Duolingo Agreement – another opportunity to learn languages - https://itsa.edu.co/notas/478-convenio-duolingo-itsa-otra-otra-oportunidad-para-aprender-idiomas#:~:text=La%20Instituci%C3%B3n%20Universitaria%20ITSA%20estableci%C3%B3%20a%20agreement%20with,a%20diversity%20of%20languages%20and%20certify%20in%20English%C3%A9s

Kearney, M., Burke, P., & Schuck, F. (2019). The iPAC scale: A Survey to measure distinctive mobile pedagogies. *TechTrends*, 63(6), 751-764. https://link.springer.com/article/10.1007/s11528-019-00414-1

Kearney, M., Schuck, S., Burden, K., & Aubusson, P. (2012). Viewing mobile learning from a pedagogical perspective. *Research in Learning Technology*. 20, 1-17. https://doi.org/10.3402/rlt.v20i0/14406

Klimova, B., & Zamborova, K. (2020). Use of Mobile Applications in Developing Reading Comprehension in Second Language Acquisition-A Review Study. *Education Sciences, 10*, 1-12. https://doi.org/10.3390/educsci10120391

Kuimova, M., Burleigh, D., Uzunboylu, H., & Bazhenov, R. (2018). Positive effects of mobile learning on foreign language learning. *TEM Journal.* 7(4). 837-841. https://www.temjournal.com/content/74/TemJournalNovember2018_837_841.pdf

Kukulska-Hulme, A. (2006). *Mobile language learning now and in the future.* Retrieved from http://oro.open.ac.uk/9542/1/kukulska-hulme.pdf

Kukulska-Hulme, A., Shield, L. (2008). An overview of Mobile assisted language learning: From content delivery to supported collaboration and interaction. *ReCALL*, 20(3), 271-289. https://doi.org/10.1017/S0958344008000335

Lim, C.P., & Churchill, D. (2016) Mobile learning. *Interactive Learning.* *https://doi.org/10.1080/10494820.2015.1113709*

Ling, R. & Donner, J. (2009). *Mobile communications*. Polity, London. https://doi.org/10.1177/1461444810393899

Liu, J. Y. (2013). Using Facebook for learning writing: EFL students' perceptions and challenges. *Paper presented at the 30th International Conference on English Teaching and Learnin*g, 18-19. doi: 10.1109/HPCC.y.EUC.2013.339

Llanes Baro, A. (2018). Reading in English as a Foregn langage: Examining differences in reading speed, comprehension, efficacy and L1 cross-linguistic influence across grades. *Investigaciones sobre lectura* , 1-49. https://dialnet.unirioja.es/servlet/articulo?codigo=6523838

Martínez, GF, Mir, F., & Garcia Romano, L. (2017). Characterization of mobile applications for teaching and learning of human anatomy. Science Education, (Extra), 1597-1604. https://ddd.uab.cat/record/184395

Marzban, A. (2010). Improvement of reading comprehension through computer-assisted language learning in Iranian intermediate EFL students. *Procedia Computer Science.* 3(2011). 3-10. https://doi.org/10.1016/j.procs.2010.12.003

Mayer, R.E. 1996. Learning strategies for making sense out of expository text: The SOI model for guiding three cognitive processes in knowledge construction. *Educational Psychology Review*, 8, 357–371. https://doi.org/10.1007/BF01463939

McDougald, J. S. (2013). The use of new technologies among in-service Colombian elT teachers el uso de las nuevas tecnologías por parte de profesores colombianos de inglés. http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S0123-46412013000200008

McLoughlin, C. & Lee, M. (2008). The 3 of pedagogy for the networked society: personalization, participation, and productivity. *International Journal of Teaching and Learning in Higher Education*, 20 (1), 10-27. https://eric.ed.gov/?id=EJ895221

Melandita, Y. (2019). *Students' difficulties in comprehending the English reading text at the second semester of the eighth grade of SMPDarul Falah Bandar Lampung in the academic year of 2018/2019.* Sate Islamic University Raden Intan Lampung. http://repository.radenintan.ac.id/8042/1/A%20Thesis%20Full.pdf

Melanita, Y. (2019). *Students' Difficulties in Comprehending the English Reading Text at the Second Semester of the English Grade of SMP Darul Falah Bandar Lampung in the Academic Year 2018/2019.* Raden Intan Lampung: State Islamic University. http://repository.radenintan.ac.id/8042/1/A%20Thesis%20Full.pdf

Metruk, R. (2021). The Use of Smartphone English Language Learning Apps in the Process of Learning English: Slovak EFL Students' Perspectives. *Sustainability, 13* (15), 1-17. https://doi.org/10.3390/su13158205

Miangah, T.M. & Nezarat, A. (2012). Mobile-assisted language learning. *International Journal of Distributed and Parallel Systems (IJDPS).* 3 (1), 309-319. https://doi.org/10.1016/j.chb.2016.07.014

Montiel Paz, A. (2017). *Enseñanza del Inglés a Traves de las apps.* Cantabria: Universidad de Cantabria. http://hdl.handle.net/10902/12566

Moreno, M., & Pajaro, M. (2017). Indisciplining the Curriculum form a complex perspective to teach English. *English Language* Teaching, 25-32. https://eric.ed.gov/?id=EJ1187935

Motiwalla, L. F. (2007). Mobile learning: a framework and evaluation. *Computers & Education*, 49(3), 581–596 https://doi.org/10.1016/j.compedu.2005.10.011

Nazrul Islam, M., Islam, I., Mundim, K. M., & Najmul Islam, A. (2020). A Review on the Mobile Applications Developed for COVID-19: An Exploratory Analysis. *IEEE Access, 8*, 145601-145610.

https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=9162032&isnumber=8948470

Novary Ngabut, M. (2015). Reading theories and reading comprehension. *Journal on English as a Foreign Langage , 5* (1), 25-35. http://repositorio.radenintan.ac.id/id/eprint/15353

Obeidat, M., Puckett, W., & Jackson, L. (2020) Mobile technology innovation. *International Management Review*, 16(1), 23-32. https://doi.org/10.4018/978-1-7998-9035-5.ch020

Ozdamli, F. (2012) Pedagogical framework of m-learning. *Procedia - Social and Behavioral Sciences*, 31, 927-931. https://doi.org/10.1016/j.sbspro.2011.12.171

Pardede, P. (2008). A Review on Reading Theories and its Inplication to the Teaching of Reading. *English Departament Bomonthly Forum of FKIP*-UKI, (pp. 1-14). Jakarta, Indonsia. http://repositorio.uki.ac.id/id/eprint/920

Parsons, D., Ryu, H. & Cranshaw, M. (2007). A design requirements framework for mobile learning environments. *Journal of Computers,* 2(4),1-8. http://www.davidparsons.ac.nz/papers/A%20Design%20Requirements%20Framework%20for%20Mobile%20Learning%20Environments.pdf

Pintrich, P. & Schunk, D. (1996). *Motivation in education: theory, research, and application.* Merrill. http://www.davidparsons.ac.nz/papers/A%20Design%20Requirements%20Framework%20for%20Mobile%20Learning%20Environments.pdf

Portilla, D. (2020). Tools of a mobile instant messaging application to strengthen the teaching-learning process of English. Technological-Educational Magazine Teachers 2.0, 9(1), 116–123.https://doi.org/10.37843/rted.v9i1.109

Pulido-Montes, C., & Ancheta-Arrabal, A. (2021). Remote education after school closures as an international response to Covid-19. Social Prism Magazine, (34), 236-266. https://revistaprismasocial.es/article/view/4217

Quinn, C. (2013). A future for M-Learning. In Z. L. Berge & L. Y. Muilenburg (Eds.), *Handbook of mobile learning*. Routledge.

Ray, D., & Coronado, C. (n.d.). *FluentU*. Retrieved 05 17, 2022, from 13 apps para aprender inglés ¡ponte a jugar con el teléfono!: https://www.fluentu.com/blog/english-esp/apps-para-aprender-ingles/

Salmon, G., (2000). E-moderating: the key to teaching and learning online, London, 2000, Kogan Page. https://www.redalyc.org/pdf/1794/179420763002.pdf

Santos, I., & Ali, N. (2012). Beyond classroom: The uses of mobile phones by female students. *International Journal of Information and Communication Technology Education*, 8(1), 63–75. http://doi.org/10.4018/jicte.2012010107

Sharples, M. (2000). The design of personal mobile technologies for lifelong learning. *Computers and Education*, 34, 177–193. https://doi.org/10.1016/S0360-1315(99)00044-5

Stevens, D., & Kitchenham, A. (2011). An analysis of mobile learning in education, business, and medicine. In A.Kitchenham (Ed.), *Models for interdisciplinary mobile learning: Delivering information to students* (pp. 1–25). IGI Global. https://doi.org/10.4018/978-1-60960-511-7.ch001

Stockwell, G. (2010). Using mobile phones for vocabulary activities: Examining the effect of the platform. *Language Learning & Technology*, 14(2), 95-110. https://scholarspace.manoa.hawaii.edu/server/api/core/bitstreams/542bd295-e000-4bca-a852-780d691a3108/content

Stockwell, G., & Hubbard, P. (2013). Some emerging principles for mobile-assisted language learning. Monterey, CA: *The International Research Foundation for English Language Education*. Retrieved from: http://www.tirfonline.org/english-in-the-workforce/mobile-assisted-language-learning

Stoerger, S. (2013). Becoming a digital nomad: Transforming learning through mobile devices. In Z. L. Berge & L. Y. Muilenburg (Eds.), *Handbook of mobile learning.* New York, NY: Routledge. https://www.taylorfrancis.com/chapters/edit/10.4324/9780203118764-52/becoming-digital-nomad-trans

Suarez-Orozco, M., & Sattin, C. (2007). *Learning in the global era: International perspectives on globalization and education.* Los Angeles: University of California Press. https://books.google.es/books?hl=es&lr=&id=2vhMA42Piv0C&oi=fnd&pg=PR7&dq=Suarez-Orozco,+M.,+%26+Sattin,+C.+(2007

Ticona, R, Condori, J., Mamani, J., & Santos, F. (2020). Sociocritical paradigm in research. *PsycheMag, 9*(2), 30-39. http://revistas.ucv.edu.pe/index.php/psiquemag/article/view/216/206

Traxler, J. (2012, November). Mobile learning-The future already behind us. In Proceedings of 2012 International Conference on Interactive Mobile and Computer Aided Learning (IMCL) (pp. 7-9). IEEE. https://doi.org/10.1007/978-3-642-32301-0_10

Walker, Z., Kho, H., Tan, D., & Lim, N. (2020). Practicum teachers' use of mobile technology as measured by the technology acceptance model. Asia Pacific Journal of Education, 40(2), 230-246. https://doi.org/10.1080/02188791.2019.1671808

Wang, M., & Shen, R. (2012). Message design for mobile learning: Learning theories, human cognition and design principles. British Journal of Educational Technology, 43(4), 561-575. https://doi.org/10.1111/j.1467-8535.2011.01214.x

Wertheim, P. H., & Abrantes, D. (2021, 11 29). *Colombia's Digital Technology Grwing Exponentially*. Retrieved 1 20, 2022, from the bridge: https://thebridge.social/colombias-digital-technology-growing-exponentially/

Wong, TY, Peko, G., Sundaram, D. y Piramuthu, S. (2016). Entornos móviles y procesos y ecosistemas de co-creación de innovación. Información y gestión , 53 (3), 336-344. https://doi.org/10.1016/j.im.2015.09.005