

Mobile learning as a support to learn English during the social lockdown

Aprendizaje móvil como apoyo para aprender inglés durante el confinamiento social

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ABSTRACT

The main purpose of this investigation was to transform the teaching of English in high school by incorporating mobile learning as a complementary strategy to foster students' autonomy. A qualitative approach was used through an action-research design, collecting information through participant observation, documentary analysis, and focus groups. Findings revealed the way learner's linguistic knowledge was significantly enhanced since they responded favorably to the Duolingo application; specifically, pupils ameliorated their listening comprehension, vocabulary acquisition, understanding of topics, and exam scores. Additionally, teenagers' educational experience was improved as this innovative practice was greatly valued by them. However, limitations related to the digital divide, technological failures, and the period of lockdown caused by the covid-19 were encountered. On the other hand, these results contribute to science as research projects like the present add to the odds in favor in adverse scenarios where educators and learners cannot meet face to face. In conclusion, it can be stated that, now more than ever, education must consider technology in the study of foreign languages.

Resumen

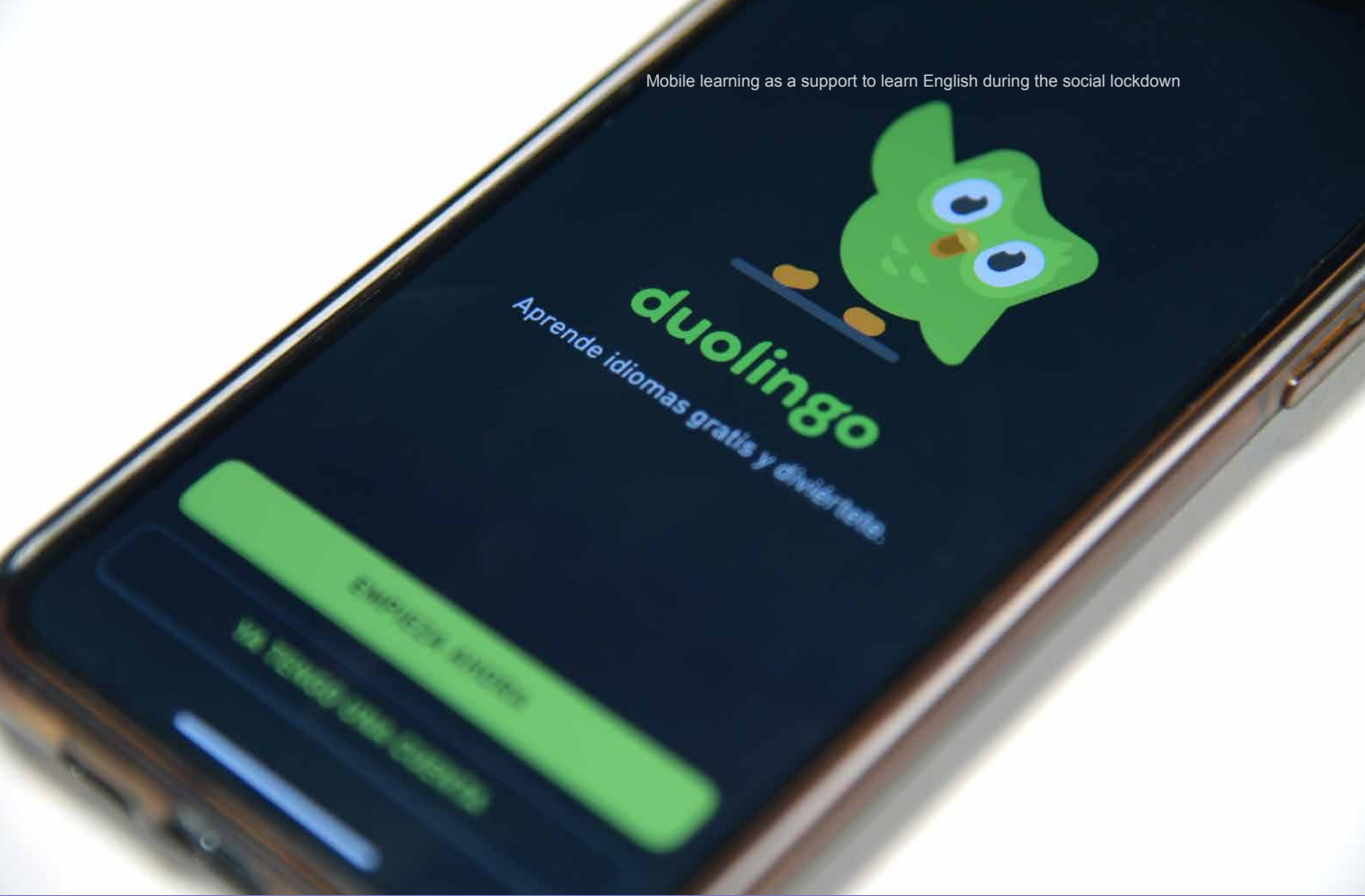
El objetivo general de esta investigación fue transformar la enseñanza del inglés en el bachillerato incorporando el aprendizaje móvil como una estrategia complementaria para fomentar la autonomía de los estudiantes. Se utilizó un enfoque cualitativo mediante un diseño de investigación-acción, recolectando información a través de la observación participante, el análisis documental y los grupos focales. Los hallazgos revelaron cómo el conocimiento lingüístico de los estudiantes mejoró significativamente, ya que respondieron favorablemente de forma positiva a la aplicación de Duolingo; específicamente, los alumnos reforzaron su comprensión auditiva, la adquisición de vocabulario, el entendimiento de temas y puntajes en exámenes. Además, se mejoró la experiencia educativa de los adolescentes ya que esta práctica innovadora fue bien valorada por ellos. Sin embargo, se enfrentaron limitaciones relacionadas con la brecha digital, las fallas tecnológicas y el período de encierro provocado por el covid-19. Estos resultados contribuyen a la ciencia, pues proyectos de investigación como el presente se suman a las probabilidades a favor en escenarios adversos donde educadores y estudiantes no pueden reunirse de forma presencial. En conclusión, se puede afirmar que, ahora más que nunca, la educación debe considerar la tecnología para promover la independencia en el estudio de lenguas extranjeras.

Keywords

English; language teaching; educational technology; active learning

Palabras clave

Inglés; enseñanza de idiomas; tecnología educacional; aprendizaje activo



INTRODUCTION

The national educational strategy in Mexico is failing to meet expectations and purposes set out to achieve an ideal English level. As a matter of fact, several studies provide information on unsatisfactory results obtained by many educators and learners in foreign language evaluations (Calderón, 2015; Ramírez-Gómez *et al.*, 2017). Fortunately, some teachers are contributing with great endeavor to ameliorate experiences in their schools' contexts by incorporating the use of technology (Kazu & Issaku, 2021). In this sense, it is intended to share how mobile learning has generated a positive impact on pupils from the Colegio de Bachilleres del Estado de Sinaloa (COBAES) during an adverse

social process suffered throughout the world: the covid-19 confinement.

The present study was carried out in eight groups of a high school community, which has different characteristics. For starters, the age of these adolescents ranges between 14 and 17 years old. Their main interests are focused on activities like playing games on mobile applications, chatting, listening to music and videos, as well as socializing with classmates. In addition, most learners come from families of a medium socio-economic level where both parents must provide to household, or whose progenitors are separated; lastly, few teenagers have social, emotional, and financial stability.

The issue is that instructional hours are insufficient to achieve the B1 level, or intermediate,

according to the Common European Framework of Reference for Languages (CEFR). Therefore, initial observations made it possible to identify that the main motive obeys to past formation issues. For example, many elementary schools in Mexico do not count with enough English teachers, or their proficiency level is not adequate which turns into an undesirable experience for the students. Also, it has been observed how some juveniles are not motivated or interested in learning another language, as other studies have shown (Calderón, 2015). Moreover, the lockdown period provoked by the covid-19 increased the difficulties for ideal educational conditions.

Therefore, an intervention was implemented using the Duolingo app to support autonomous learning. It was intended to strengthen learners' independent learning skills with the aim of counterattacking the educational context's disadvantages. It is expected that the implementation of strategies like this can contribute to the goals of the English subject, in other words, to consolidate and develop students' ability to communicate at an intermediate level.

The foregoing allowed the object of study to be defined as the use of an application in English language learning and its influence in the educational experience of high schoolers. Thus, the following research question was established: how does the use of Duolingo contribute to an improvement of the English teaching-learning experience? Likewise, the general purpose was to transform quality of formation processes from an innovative approach that incorporates mobile learning.

This intervention suggested an educational improvement by linking theory with practice by recurring to a critical and reflective approach through action research. Hence, the following proposition or tentative answer was posed according to the premises of action research (Ary *et al.*, 2010; Cohen *et al.*, 2018; Norton, 2009; Stringer, 2007). The use of the mobile application Duolingo contributes in an innovative way to an enhancement of English language learning since it facilitates the

mastering of different linguistic items such as vocabulary, listening, and reading comprehension.

FOREIGN LANGUAGE LEARNING THROUGH TECHNOLOGY

Society has become more digitalized today to the point that a dependence on technology has been created almost everywhere. This is a fact often seen in many educational settings where adolescents are rooted in interaction through mobile devices, which at the same time are useful for them to keep up to date in family, local, national, and even international contexts (Montiel, 2017). An example of a device that has generated such necessity is the cellular phone with the countless applications found to be helpful for people.

Jarvis & Krashen (2014) argue that learners frequently resort to digital resources as an innate activity of their daily lifestyle. However, this interaction leads them to an acquisition of other languages through a subconscious process in a natural way. Simultaneously, individuals interact with platforms, for example, Facebook, YouTube, Twitter, among others, without ruling out Mobile learning (M-learning).

The research related to M-learning offers some insights to the use of mobile phone applications to learn foreign languages (Kukulskahulme, 2018). For instance, Bustillo *et al.* (2017) indicate that implementing Duolingo contributed to the development of listening comprehension skills in students at the University of Santiago de Cali. Concurrently, these experts acknowledge how this app is very popular since it has approximately eighty million users worldwide; in addition, it fosters learners' motivation by setting goals, prizes, and manageability to administer their time using the application.

According to Shortt *et al.* (2021) the language education processes through portable devices may also be referred to as an approach called Mobile Assisted Language Learning (MALL). Likewise, there are some advantages when applying

M-learning (Salinas & Marin, 2014). For example, learners are able to review topics in class hours, days, or weeks after they have been addressed by teachers. In addition, incorporation of apps or cellular phones fosters a ubiquitous schooling environment from anywhere and at any time without a need for individuals to remain in a geographic location (Hashim *et al.*, 2017), which favors flexibility as well as ease of access to information provided these users have an internet connection and the required technological resources.

Despite the numerous benefits of the implementation of technology with young people there are also several drawbacks related to the famous digital divide (Parker *et al.*, 2011, as cited in Montiel, 2017). Nevertheless, it is important not only to appeal to the interests of agents in different contexts, but to lose fear towards change through actions that lead to an innovative transformation of educational processes.

METHODOLOGY

A qualitative approach was embarked on putting through an action-research design in an ex-

ploratory-descriptive scope. Such methodology, which emerged as part of the teacher-researcher movement (Carr & Kemmis, 1986), allows to address contextual problems, promoting the emancipation and transformation of those affected or interested in improving educational quality (Ary *et al.*, 2010; Cohen *et al.*, 2018). Thus, the models proposed by Lewin (1948), Norton (2009), and Stringer (2007) were taken into account to devise one based on the conditions and possibilities that concern this investigation (figure 1).

Instruments

As a majorly qualitative methodology, this research appealed to participant observation, documentary analysis, focus groups, and a learning styles test. The following instruments were used to carry out this investigation:

- VARK test (Visual, Auditory, Reader/Writer, and Kinesthetic). The version developed by Fleming & Mills (1992, as cited in García, 2007) was useful to find out whether Duolingo would be an appropriate application to use in the intervention.

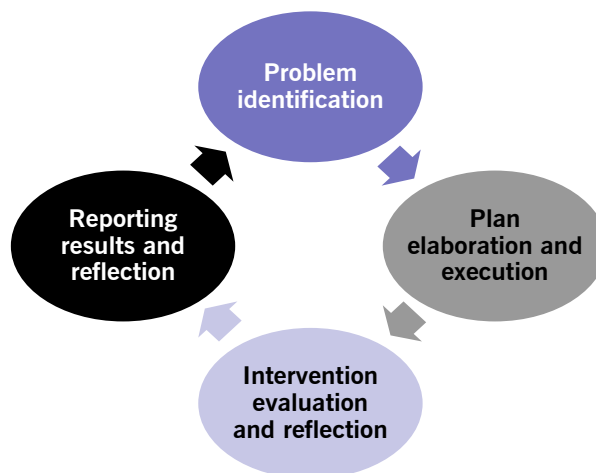


Figure 1. Representation of the action research process.

- Digital participant observation form. This format was used to register reflections of the daily practice, results from students' participations, expressions, and feelings.
- Documents. Attendance lists where students' assignments were registered, and tutoring reports formed part of the documentary analysis.
- Digital focus groups form. Focus group formats allowed an easy way to record information during held sessions (table 1).

Sampling

Action research is regarded as an inclusive methodology in which all those individuals interested in overcoming a status quo or facing a problem must participate (Carr & Kemmis, 1986; Stringer, 2007). For such a reason, the study appealed to comprehensive sampling (Ary *et al.*, 2010); this meant for every student using the mobile app Duolingo to be included. Participants were informed that the inquiry involved no risks at all since the use of the application contributed to the overall foreign language learning process.

Thus, all teenagers who are part of the teacher-researcher's classes were taken into account, that is, 367 learners. Unfortunately, not all of them had the opportunity to use Duolingo since many did not have internet at home, or their technological devices did not support the software because of technical reasons. This justified the sampling strategy, where only 200 students were

included, 140 women and 60 men, between 14-17 years of age.

Procedure

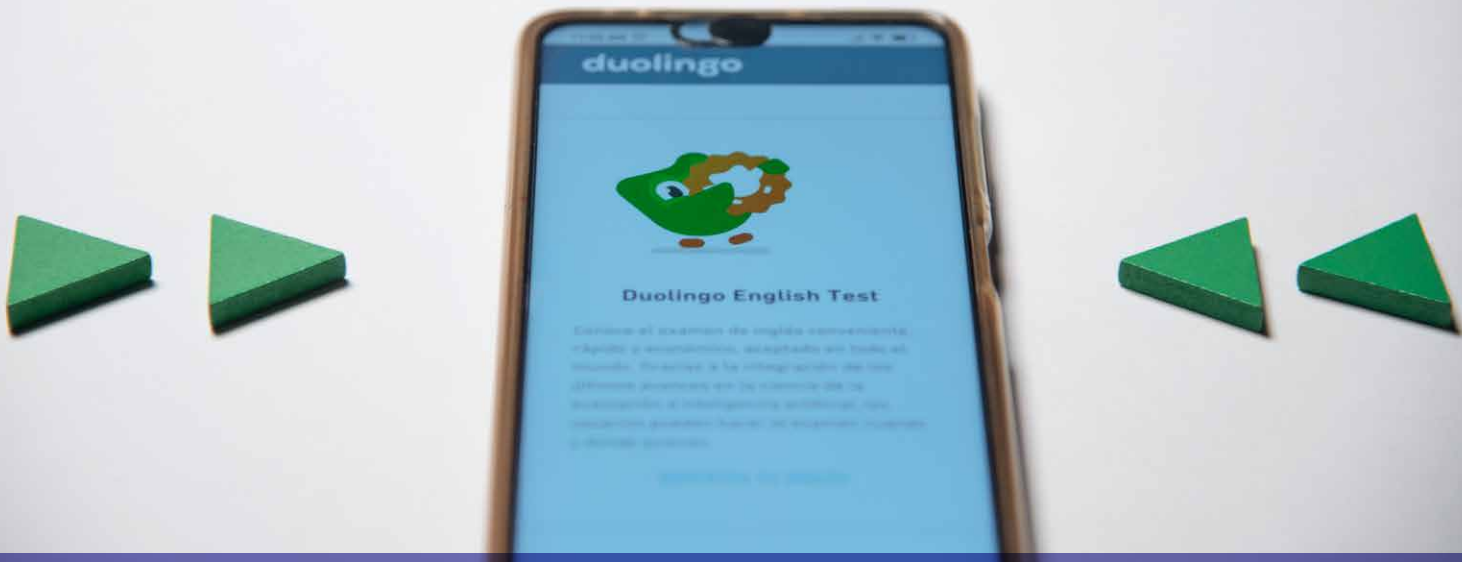
The procedure followed processes that were adapted to the context needs and emergent social situations. During June 2021, a reflective diagnosis was conducted on the teacher-researcher's educational practice regarding English language teaching. In this sense, a record was made doing participant observation and documentary analysis, such annotations were useful to carry out a first analysis of information through initial, focused, and axial coding (Charmaz, 2006).

In a second moment, an action plan was created including three strategies: 1) learning styles diagnosis; 2) selection of a mobile app to learn English; and 3) application and follow up of the intervention throughout the first semester of the school year 2021-2022. Again, participant observation as well as documentary analysis were conducted to analyze data with initial, focused, and axial coding.

Finally, eight focus groups were organized to evaluate the intervention during November 2021. Likewise, participant observation and documentary analysis complemented more grounded results and an establishment of a hypothesis related with the use of mobile phone apps to improve English language learning in high schoolers. Throughout the research, data analysis was conducted using a digital word processor (Microsoft Word), which is valid in qualitative analysis (Watkins, 2017).

Table 1. Distribution of participants using each of the techniques

RESEARCH TECHNIQUE	PARTICIPANTS	MEN	WOMEN
VARC test	238	67	171
Participant observation	200	60	140
Documentary analysis	200	60	140
Focus groups	80	30	50



RESULTS

The results of the intervention project are presented in correspondence with the methodology employed. It is worth mentioning that even when this investigation took place in a Spanish speaking setting, accounts were translated properly by the teacher researcher who holds international certifications of an advanced proficiency level in English.

PROBLEM IDENTIFICATION

Data retrieved from participant observation records and documents of the teacher researcher's practice were used to conduct a qualitative analysis of the information with techniques proposed by Charmaz (2006). In this regard, initial, focused, and axial coding allowed the identification of categories which led to the discovery that pedagogical conditions were not sufficient to achieve institutional goals and meet adolescents' interests. The identified theoretical categories

were named as: *academic-administrative suspensions*, *bad learning experiences*, and *affective problems*.

Unnecessary official suspensions are frequently decreed by local or state authorities. These academic interruptions interfere with the syllabus development since teenagers stop receiving education; nonetheless, some are caused by meteorological complications, waves of violence, or other types of contingencies that put educational communities at risk. On another part, certain students do not have basic knowledge to perform thoroughly in the subject; according to informal interviews made to adolescents, the lack of English teachers in previous years, their low language level, or deficiency in pedagogic competence can be a reason for learners' not having developed skills to do well in English. Additionally, there is an appreciation of affective problems as high schoolers do not show enough motivation to succeed and become better persons at intellectual or human dimensions; in addition, it has been detected how quite a few juveniles have low self-esteem as they are afraid or feel shame to participate in class.

PLAN ELABORATION AND EXECUTION

Planning took into consideration different guidelines proposed by Stringer (2007). Three main actions were undertaken: 1) diagnosis of learning styles; 2) selection of an English learning mobile phone application; and 3) implementation and strategy follow up. Participant observation as well as documentary analysis was conducted during the execution of this strategic plan.

Action 1

The VARK questionnaire was applied to 238 learners (table 2), but even when everybody was taken into account, quite a few adolescents simply did not want to take the test and others did not have the technological infrastructure at home to do so (internet, computer, or cell phones). Also, it is important to mention that not all students who answered the instrument used Duolingo.

Test results showed that most students obtained a kinesthetic learning style. Auditory learners were second, visuals third, and reader/writer styles were last. These findings suggested a compatibility with the strategy of using Duolingo to strengthen English language education processes.

Action 2

Different mobile phone applications like Duolingo, Hello English: Learn English, and Aprende Inglés gratis! were evaluated before selecting one. Having compared the apps, Duolingo was

chosen since it has approximately eighty million users worldwide; in addition, it sets goals and time to administrate study (Bustillo *et al.*, 2017). Another very important didactic element was diagnostic, formative, and summative evaluation for which the app applies several exercises that constantly measure learning. Moreover, this software makes use of various resources as well as dynamics; for example, gamification, images, listening, and interpretation activities.

Action 3

The Duolingo platform was used to create groups and administrate learning activities (figure 2). One of the main advantages of this application is that teachers can organize pedagogical processes on the website, which allows a personalized follow through by assigning specific tasks to each group. At the same time, learners are able to share progress and achievements with educators.

EVALUATION OF INTERVENTION

The evaluation of the intervention followed the premises of action research under the critical educational paradigm. In this regard, the qualitative approach allows making conjectures based on rigorous procedures for collecting and analyzing information (Ary *et al.*, 2010; Charmaz, 2006; Stringer, 2007). Hence, eight focus groups were conducted throughout November 2021. Each session consisted of 10 students, all of which participated voluntarily. Simultaneously,

Table 2. VARK test results

LEARNING STYLE	PARTICIPANTS RESULTS	MEN	WOMEN
Visual	52 (21.84%)	16 (6.72%)	36 (15.12%)
Auditory	68 (28.57%)	20 (8.40%)	48 (20.16%)
Reader/writer	40 (16.80%)	10 (2.20%)	30 (12.60%)
Kinesthetic	78 (32.77%)	21 (8.82%)	57 (23.94%)

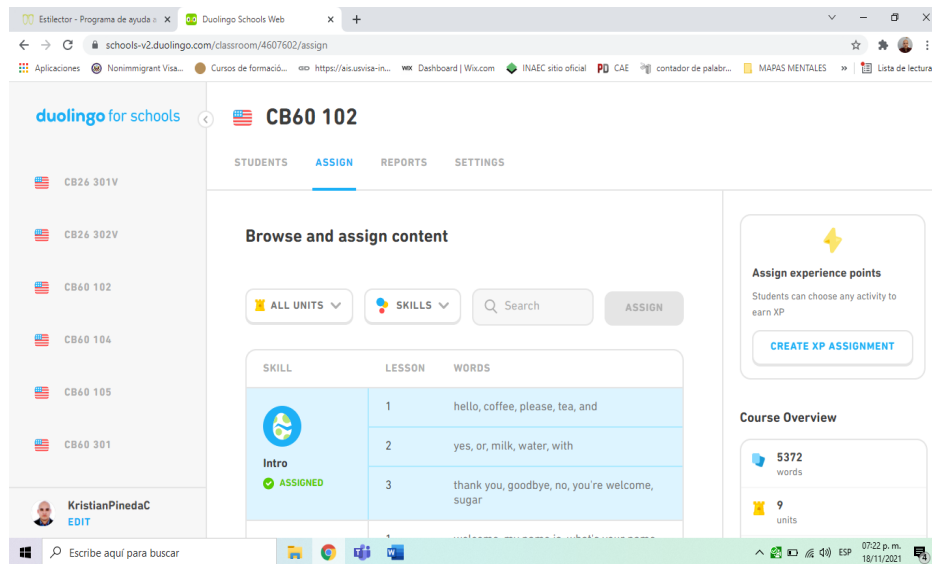


Figure 2. Screenshot of creation of study groups and assignments in Duolingo.

Source: retrieved from the platform Duolingo for schools.

constant reflection between theory and practice was recorded in participant observation forms; in addition, other academic documents, part of the teacher-researcher's responsibilities, were included in the analysis.

The results revealed how the learners' linguistic knowledge was significantly improved since they reacted favorably to the use of Duolingo. In that sense, focus groups, participant observation, and documentary analysis permitted a triangulation of information which allowed the present teacher-researcher to verify the impact of the intervention. The themes derived from such categories related to a development of *listening comprehension*, *vocabulary acquisition*, *understanding of topics*, and *exam scores*. Moreover, adolescents' educational experience was enhanced, considering this innovative practice was greatly valued by them. Nevertheless, there were some constraints associated with the digital divide, technological failures, and the covid-19 lockdown period.

Listening comprehension

Since Duolingo models the pronunciation of vocabulary and challenges to identify words, many participants reported to have developed a capacity to comprehend phrases in spoken discourses in movies and TV shows. Next, an answer provided by a student makes this evident:

I guess learning English with this application is fun. I mean sometimes it is frustrating, but in a good way since I am looking at words over and over, I learn them by heart. Last time, I decided to watch one of my favorite TV shows in English, and I was amazed at how I was able to understand some of the things they were saying (Student 1, first focus group).

Vocabulary acquisition

Like in other studies conducted throughout the pandemic (Hidayati *et al.*, 2021), the students showed a significant improvement in

their vocabulary when using Duolingo. Some aspects which influenced this appreciation were that, according to responses, learners had opportunity to review lessons and interact with words in a fun way as this application would give them symbolic rewards every time progress was made. A participation during the focus group pointed out such an aspect:

I mean, I think that most of the vocabulary I have learned during this time is because of Duolingo. You should make it a permanent strategy for the rest of the school year as I have seen so much progress in my learning. (Student 7, second focus group)

Understanding of topics

Another great option offered in Duolingo is that the comprehension of certain grammatical topics is reinforced. In this sense, some adolescents showed more participation during classes acknowledging they had done better by practicing their English in the mobile phone application. Next, a commentary on such appreciation:

...ever since I started using this application, I have been able to better understand your classes. For some reason, I think it is because I am putting words in the correct order and that has made me realize how to structure sentences in English (Student 10, fifth focus group).

Exams scores

The practice activities provided in Duolingo are similar to certain exercises that adolescents have to answer in institutional evaluations. Therefore, a few learners reported they felt that the tests had been easier; as a matter of fact, the documentary analysis permitted to observe how more students were getting better grades, and some of the ones who were failing were passing. A student stated on this aspect:

I have indeed seen results with this application. For example, I have been able to understand most reading exercises in exams. I mean, it is not like I pass every single test with the highest score, but at least I feel that I am doing way better (Student 5, sixth focus group).

In order to incorporate all participants' perspectives, answers in focus groups were grouped according to the categories described before: *listening comprehension*, *vocabulary acquisition*, *understanding of topics*, and *exam scores*. Now, qualitative research is characterized by being narrative, dialectical, and making evident feelings of learners as well as understanding of problematics, but this investigation design falls under the critical educational science where other methods of analysis may be incorporated (Ary *et al.*, 2010; Carr & Kemmis, 1986; Stringer, 2007). Thus, percentages were calculated in consonance with the concurrences for each category. Such numerical information intends to include responses made by 80 students (figure 3), and in no way has the purpose of measuring any variable like in a quantitative study.

In order to include all 200 students, the information from participant observation records and documents part of the teacher-researcher's daily responsibilities were put together with data analyzed in focus groups by incorporating the coded units of analysis into each of the main categories. Figure 4 shows the appreciation on how Duolingo impacted high schoolers' English language learning experience.

Thereupon, as part of the qualitative tradition, it can be hypothesized that using M-learning with apps such as Duolingo ameliorates learners' educational experience. Also, English language education is enhanced through the app since it incorporates a gamification environment which makes learning a positive experience; plus, it helps to develop listening comprehension skills, vocabulary retention, understanding of topics, and it supports preparation for certain exam exercises. However, as education is context specific these

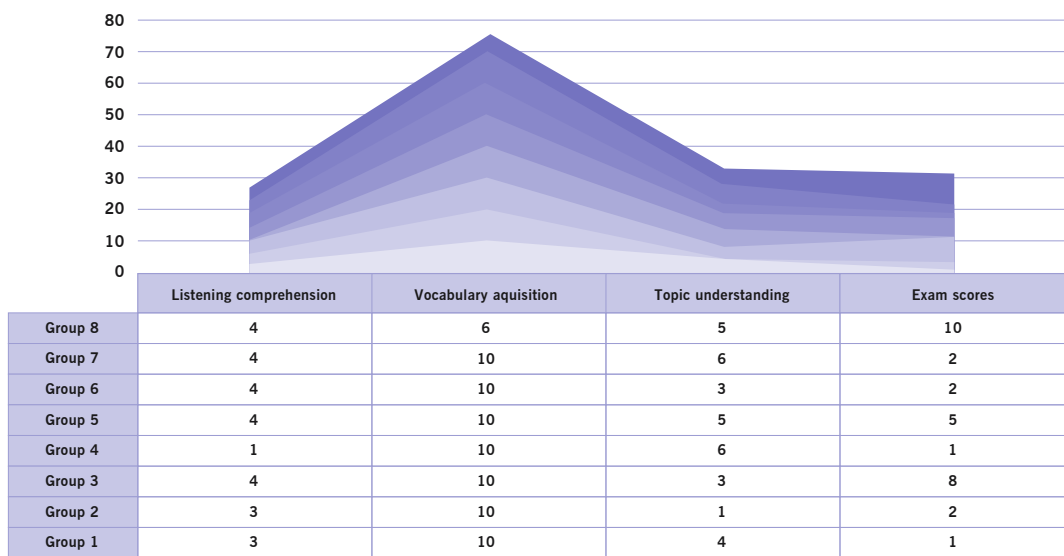


Figure 3. Impact of English language learning with the use of Duolingo.

Note: the image reflects responses made by 80 students in focus groups.

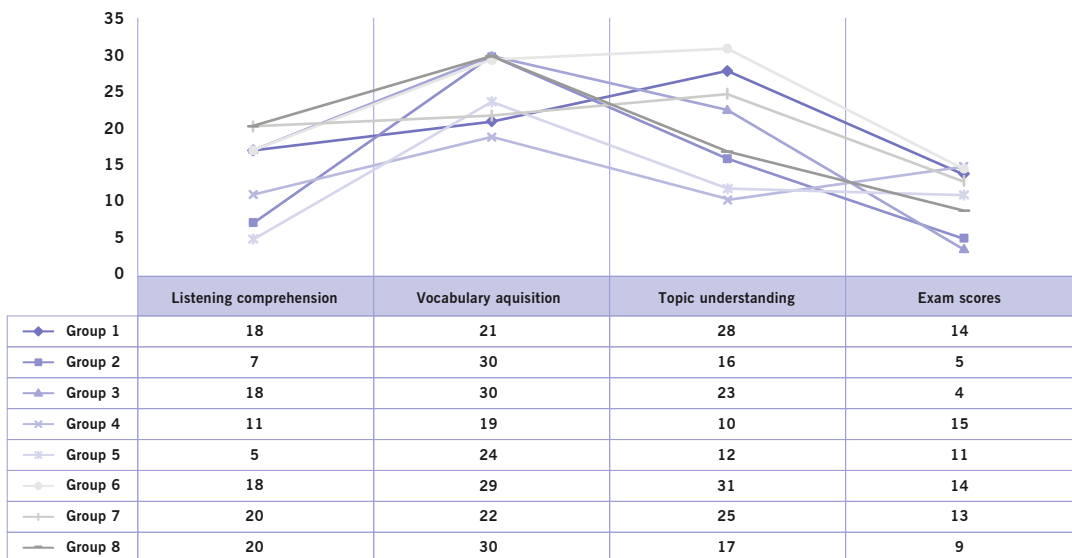


Figure 4. Whole sample impact appreciation of English language learning with Duolingo.

Note: this graph includes interpretation of observation records, documentary analysis, and focus groups including 200 learners.

findings are in no way generalizable, but researchers are invited to evaluate whether their conditions are similar to the present in order to use this application in their classroom settings.

DISCUSSION

There were several limitations throughout this intervention. Hereunder, such constraints are discussed; in addition, findings are contrasted with other studies published in indexed journals. One of the limitations identified was that there is no application available for cellular phones that allows monitoring students' progress, which consequently requires accessing Duolingo's platform from its official website. Other constraints detected were categorized as follows: 1) lack of space in mobile devices; 2) difficulty in entering Duolingo groups; 3) technological failures; and 4) the period of confinement due to covid-19.

Lack of space on mobile devices

During the intervention, some students argued about not having enough room

One of the limitations identified was that there is no application available for cellular phones that allows monitoring students' progress, which consequently requires accessing Duolingo's platform from its official website

on their cellular phones to install the application. This issue was addressed by providing them with Duolingo's web address so that they could carry out learning activities. However, such a situation did not cease to be a problem since the same excuse continued to be presented by a few high schoolers.

Contrastingly, Munday (2016) conducted an investigation with the aim of seeing if this mobile app could be employed in a language course following the same idea of ubiquity, which in turn would serve as a complementary activity to learners' language acquisition. The expert also used the web address as an alternative to provide more accessibility options. Subsequently, the researcher observed how few students decided to continue using Duolingo as an independent learning strategy as they saw it to be useful, an aspect as well identified by other authors (Nushi & Hosein-Eqbali, 2017).

Difficulty entering Duolingo groups

Those students who had trouble entering the groups showed their cell phone to demonstrate the case. As a solution, they were asked to answer the app without accessing the Duolingo group, and progress was registered manually in attendance lists. It is worth mentioning that very few mobile devices presented such problems, but it was clear how this software was not compatible with every single device.

Technological failures

There were few cases in which the Duolingo system did not report progress of a few learners who met learning goals set through the platform. Additionally, for some reason the website that allowed

monitoring application stopped working. This issue was faced by asking pupils to present their mobile device with progress, and again achievements were registered manually in attendance lists.

Confinement period

Unfortunately, the due to covid-19 social lockdown forced all of Mexico to suspend face to face educational activities. Throughout this moment, the digital divide was more evident than ever; many high schoolers argued that they had no internet or that their cell phones could not operate Duolingo. Even though the application is free to use, it requires online connectivity. In extreme cases, those students who did not have the chance to utilize app at all were given a follow up with teaching-learning assignments implemented regularly. These juveniles in specific were discarded from this intervention without affecting them academically.

In a study carried out by Habibie (2020) and Kenny (2014), such a requirement of online connectivity weakness was also identified; furthermore, these experts state that certain activities cannot be conducted on both PC and smartphones. Hence, the solutions tried throughout this intervention may not have contributed to solving the digital gap, but they looked forward to avoiding exclusion of learners in the learning and evaluation process.

Likewise, research conducted by Nadhifah & Puspitasari (2021) demonstrates the effectiveness of M-learning during the confinement period as a self-learning strategy with the help of Duolingo. Their investigation revealed how high schoolers felt pleased because not only was the application easy to use, but it as well helped them to acquire skills to formulate

To sum up, it can be concluded that M-learning favored English learning in high schoolers by promoting an enhancement in their listening comprehension, vocabulary acquisition, understanding of topics, and exam scores

expressions in English. Nevertheless, the app seemed quite useless for those learners, whose level was labelled as intermediate or advanced.

CONCLUSIONS

To sum up, it can be concluded that M-learning favored English learning in high schoolers by promoting an enhancement in their listening comprehension, vocabulary acquisition, understanding of topics, and exam scores. Simultaneously, the process undertaken allowed the fulfillment of the general research purpose of transforming the teaching-learning experience by incorporating technology through the implementation of Duolingo for students to study foreign language independently. Despite the adversities and disadvantages that occurred, the benefits had a greater impact than these negative issues.

Then again, research will continue by using other cell phone applications that reinforce English language teaching. Hence, the following investigation questions are

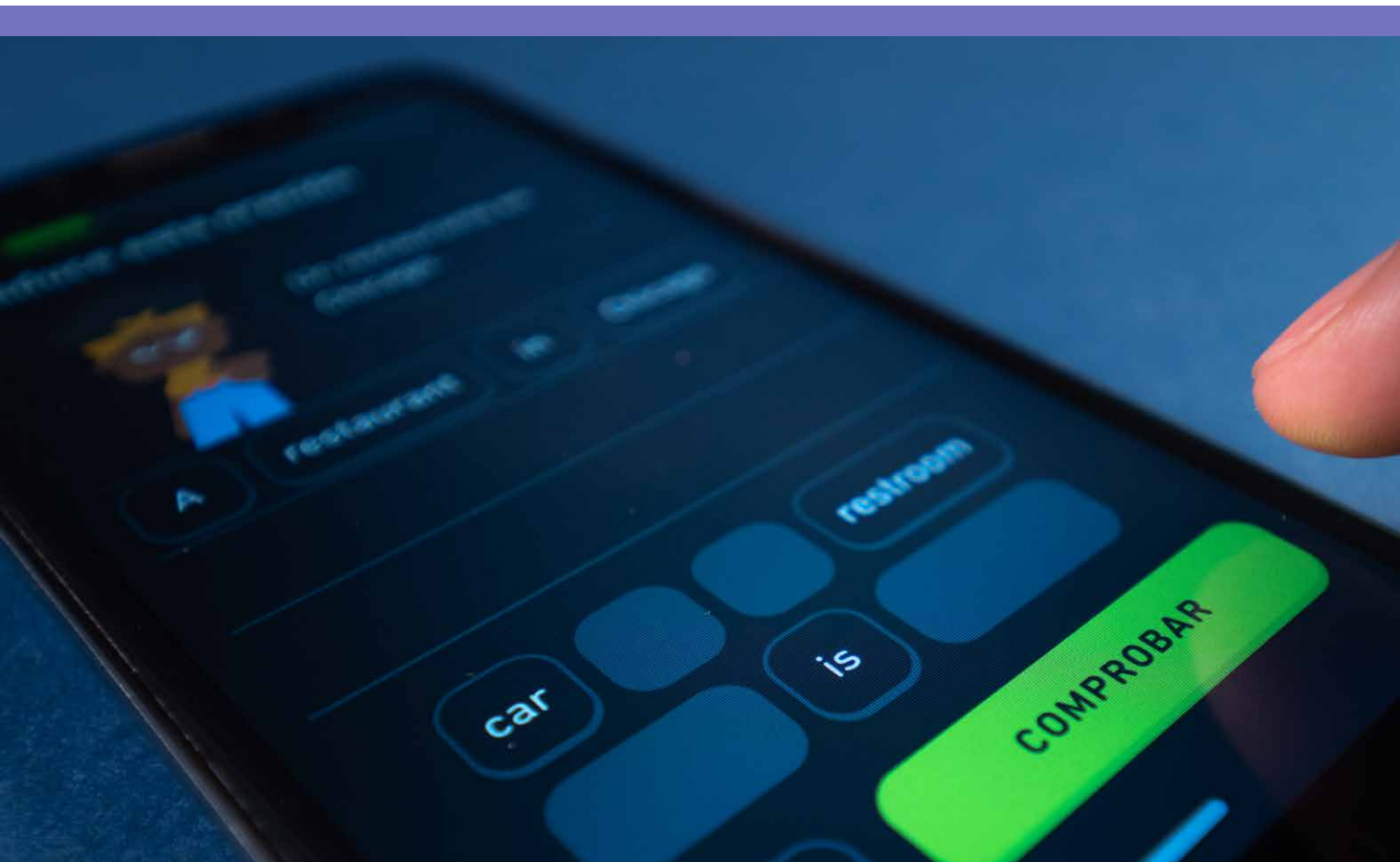
posed: 1) what mobile phone apps can be used to foster skills such as speaking, reading comprehension and pronunciation in adolescents? and 2) how far do these applications favor the development of communicative competence in high schoolers? Now, additional interrogatives may be formulated according to every educational context, but creativity and challenge is up to educators and learners.

The findings in this paper are in no way generalizable as action research is perceived as a majorly qualitative methodology confined under the critical educational science. In other words, teacher-researchers are welcomed to conduct investigation processes by appealing to the present study design; nevertheless, results may vary according to every specific scenario, that is, they might be better, the same, or worse than the ones presented in this article. *a*

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