MONKIMUN'S EDUCATIONAL APPS TEACH A SECOND LANGUAGE MORE EFFECTIVELY THAN DUOLINGO

Introduction

Emerging technologies are defined by G. Veletsianos as "tools, concepts, innovations, and advancements utilized in diverse educational settings to serve varied education-related purposes" (2010, p.3). The influence of emerging technologies on pedagogy has become increasingly of interest in educational literature. Adell and Castañeda (2012) discussed technology and its effect on pedagogical practices, noting, in part, the following features:

- They (pedagogical practices) see education as going beyond the acquisition of knowledge and skills
- They are based on a variety of pedagogical theories, from constructivist to project-based and beyond
- They go beyond the classroom, taking advantage of global resources and tools
- The activities are creative, divergent, and open-ended

In short, the technology offers unlimited possibilities for new educational practices, which are potentially disruptive when contrasted with traditional instruction. These practices open up a wide range of possibilities both for professionals working in the education sector and the learners themselves.

Clements and Sarama (2002) emphasized the advantages of implementing technology in education starting at a young age. Other authors emphasized the importance of Information and Communication Technology (ICT). Castek, Dalton, and Grisham (2012, p. 304) pointed out that in today's world, people engage in communication activities that rely on words—as seen in Facebook, texting, instant messaging, etc. Through the use of digital media, there are limitless opportunities to develop concepts and deeper understandings of knowledge. In their research, Correa and Pablos (2009) stated that research has focused on technologies that will develop creativity, self-expression, and critical thinking, noting that there is

much more to explore, such as an analysis of organizational and educational changes in practices triggered by ICTs (p. 140).

Motivation

When focusing on the evolution of education as it is shaped by new technologies, we must consider the characteristics of these new practices and structures. One of the most influential aspects of learning and knowledge acquisition is the role of motivation. Castek, Dalton, and Grisham (2012) described a learning situation in which learners were engaged in using technology, stating that the scenario "reminds us of the importance of motivation and authenticity in our students' education" (p. 304). There are multiple studies that show the existence of a direct link between motivation and good academic performance. For example, Orozco and Diaz (2009) concluded that motivation is one of the principal pillars when it comes to successfully passing mathematical exams. Graves et al. (2012) made motivation a number-one priority when designing vocabulary instruction that focused on prefixes (p. 105).

Another example, closely related to this study, is that of Kolb and Kolb (2010), in which the influence of motivation on the acquisition of foreign languages was researched, with the results clearly showing a correlation between motivation and success.

Age of Learner

Besides motivation, there is another important factor when learning foreign languages: the learner's age. It has been shown that the younger individuals are, the better their ability to learn, thanks to the flexible state of the human brain during the first years of life. This ability of the brain, which allows the neurons to respond to input, adjust the responses, form connections, and even reorganize the connections, is referred to as neuroplasticity. López (2011) mentioned the importance of the prefrontal cortex's plasticity during youth, which leads to higher flexibility in improving connections through learning and practice. According to Diamond in 2002 (cited by López in 2011), the prefrontal cortex governs (among other superior functions) the learning and planning process and the understanding of language. These factors are key when acquiring a new language.

All things considered, it can be

concluded that a learner's young age and motivation are factors that provide a solid foundation in the process of acquiring a foreign language. This raises the question of how to motivate learners at young ages so that they can learn a second language. One possible answer to this question is to add a ludic (play) component to the learning process (Benítez, 2010). There is evidence that learning through a playful process improves the educational quality and learning strategies of students. According to Palacino (2007), "The game is a ludic medium that establishes a healthy academic competition, which forms a base to overcome obstacles and achieve goals that seemed unachievable before." Valdiviezo (2011), in his study of the education field, underlines the tremendous importance that the ludic element has in the formation and education process.

Methodology

For this study, we evaluated and quantified the English learned by children of ages five to six years who were attending the third grade of Educación Infantil. The subjects completed exercises in two different educational applications designed to teach English. The first exercise was a minigame included in the Monkimun app that features the ludic component. The other participants of the study completed an exercise in a Duolingo app similar in its characteristics to the Monkimun app, but lacking the ludic component.

Hypothesis

In alignment with the theories discussed above, we hypothesized that the children between ages five and six years will have better learning outcomes with the application that contained a ludic component (Monkimun) than with the application based on the traditional form of teaching without a gaming component (Duolingo).

Participants

Nine children between ages five and six years, who were students of CEIP Juan Arrabal school in Barco de Ávila, comprised the study.

Materials

- **iPad tablet and headphones**
- **MonkiHome application related to food:** MonkiHome Kitchen and flashcards, as well as audio files with the vocabulary contained in the game.
- **Duolingo application related to food:** exercises including vocabulary and flash cards, as well as audio of the exercise vocabulary.

Sample size

Intrasubject study with sample size N=9

Design and Protocol

We divided each condition of the investigation into three parts. First, we conducted a pretest in which the children related the recorded vocabulary with flash cards containing the images of the vocabulary. Next, the children used the respective application. Finally, we conducted a posttest that was identical to the pretest, which compared the words that the children originally knew to the ones learned through the activities ones.

- **Condition 1:** Pretest on the Monkimun vocabulary, followed by a one-time play-through of the MonkiHome Kitchen minigame, followed by the Monkimun posttest and the recording of the results.

- **Condition 2:** Pretest on the Duolingo words, followed by the Duolingo learning activity, followed by the Duolingo posttest and the recording of the results.

Each participant passed through both conditions in a counterbalanced order, meaning that half of them started the test in condition 1, while the other half began with condition 2.

In both cases, we used words of low or medium difficulty related to food. However, it should be noted that in the case of the Monkimun application, we selected one game among many games developed especially for children that deals with food vocabulary. With the Duolingo application it was more difficult to find something aimed particularly at children. Therefore, we selected the only part of the exercises that students of ages five and six years were capable of completing. Because it was difficult to find appropriate words in the Duolingo exercises, five words were chosen from each application.

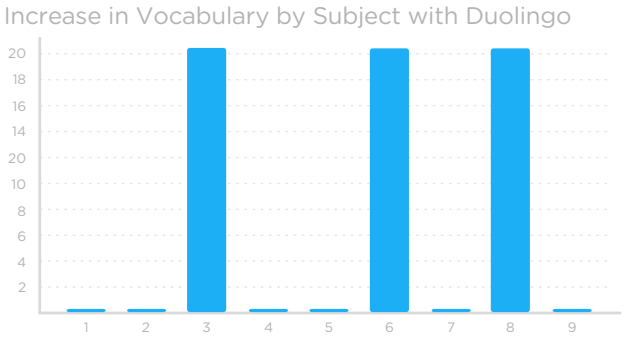
At the end of the experiment, the participants were asked the following question: “Which application did you like more or seemed more fun to you?”

If the participants answered both or that they didn’t know, another question was asked: “If you could only play one of them tomorrow, which one would you pick?”

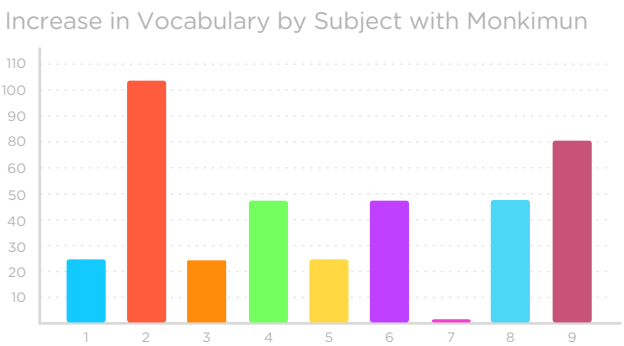
The results follow.

Results

As a first step, we measured the percentage increase of each child from the pretest to the posttest in both applications. We then analyzed separately (by application) the percentage of learned words comparing the number of new words, learned through the data obtained in the pretest and the posttest.



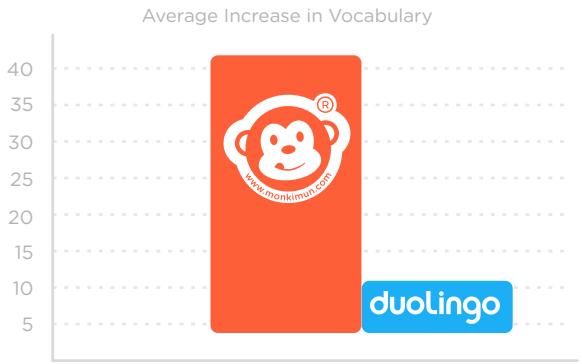
In this first graph, the increase in learning percentage in the Duolingo application can only be shown for three students: that is to say, only 33.33% of the sample learned new words. Furthermore, it is important to emphasize that the highest increase was: 20%; among the individuals that learned something, none of them learned more than 20%.



The second graph shows the percentage increase in learning that was attained by students working with the Monkimun application, which includes the ludic component. All but one of the participants (88.8%) increased their vocabulary using the Monkimun application.

Next, we evaluated the data regarding the quantity of the increases. The maximum increase achieved was 100%, demonstrating that this participant, who knew no words when taking the pretest, learned all of the words presented in the application.

To compare both results, we calculated the average percentage increase in the learning outcomes:



As seen above, the application Monkimun that combines playful components with learning components, led to better results as measured by the number of words that the children learned.

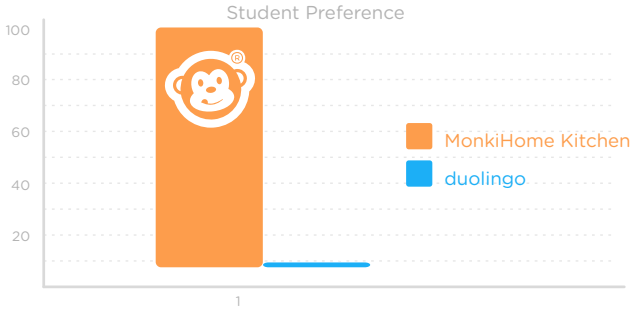
Focusing on the percentage of words learned, Monkimun (the application that combines learning with play) led to a 35.56% increase, while Duolingo (the application based on traditional learning) led to a 6.67% increase.

Finally, we analyzed the responses to the questions that the students answered after finishing the posttest:

At the end of the test, we asked the following question of the students: "Which application did you like more or seemed more fun to you?"

If the student answered both or they didn't know, another question was asked:
"If you could only play one of them tomorrow, which one would you pick?"

The following chart shows the results of the questions:



This graph shows that each one of the children (who used both applications) preferred to play more with the Monkimun's application than the Duolingo application (without the ludic component).

Conclusion

In our introduction we mentioned three factors that influence understanding the process of learning and transferring knowledge. First, it is highly beneficial for students if the process of learning another language (such as English) begins and becomes established at a young age. Furthermore, new technologies have evolved and continue to evolve quickly. It is logical that during this evolution they would also invade the educational space. Further, if they are utilized in an appropriate manner, they can be of great help in facilitating the process of teaching new content in a classroom.

This study compared two applications designed to teach English that followed different structures. The Monkimum application was especially designed for the children between 2 and 6 years of age. Also, Monkimun incorporates the ludic component: using entertaining gameplay. Duolingo limits itself to transferring knowledge without applying the motivational component of gaming.

The results demonstrated that children learned more words when a playful component was added to the learning process with Monkimun than if they were limited to memorizing concepts with Duolingo. Furthermore, when participants were asked which application they would prefer to continue using, every child chose the Monkimun application, which implies a better and more constant learning effect in the long run for two reasons:

1. The content of the application is better retained with less effort.

2. It is more probable that the children would continue playing on subsequent days.

Finally, keeping in mind that motivation is indispensable for the mastery and internalization of new content, we are almost compelled to use the ongoing revolution in the technological space to revolutionize the way in which content is taught. Making use of games and vital tools, while having fun, increases motivation and in turn notably improves the process and results of learning new content.

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