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Using Digital Comics for Enhancing EFL Vocabulary Learning during the COVID-19 Pandemic

Luz Castillo-Cuesta 

Universidad Técnica Particular de Loja, Loja, Ecuador

Ana Quinonez-Beltran 

Universidad Técnica Particular de Loja, Loja, Ecuador

Abstract. The aim of this quantitative study is to determine the impact of using digital comics to strengthen English as a Foreign Language (EFL) vocabulary knowledge during the COVID-19 pandemic. The approach was quasi-experimental with 262 public high school students from three of the four regions of Ecuador. The students' ages ranged from 12 to 14 years and their proficiency level was A1 in accordance with the Common European Framework of Reference for Languages (CEFR). They were divided into control and experimental groups. The participants in both groups received explicit vocabulary instruction through workshops, but the experimental group had the opportunity to practise EFL vocabulary using digital comics while the control group used supplementary resources and the textbook established by the Ecuadorian Ministry of Education. The data were collected using pre-tests, post-tests, and a perception survey. Based on the statistical analysis, the results showed a significant improvement in vocabulary acquisition in the experimental group. This group also demonstrated a positive perception of the use of digital comics for enhancing EFL vocabulary knowledge because comics allowed students to create original digital stories and customise them according to their preferences. Further research might consider the use of comics for teaching specific linguistic skills in on-site learning environments.

Keywords: vocabulary; digital comics; learning; public high schools

1. Introduction

Vocabulary is an essential component of learning English as a Foreign Language; different researchers have highlighted its importance for developing all the linguistic skills. Because languages are founded on words, vocabulary is a key component of language (Thornbury, 2002; Cahyono & Widiati, 2008; Bancha & Tongtep, 2021). For Lewis (2005), "Lexis is the core or heart of language" (p. 89).

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In the same way, Nation (2012) acknowledges that there is a complementary connection between vocabulary mastery and language use, and Schmitt (2010, p.4) states, “learners carry around dictionaries and not grammar books” to demonstrate the significance of vocabulary for language learning; this author claims that vocabulary knowledge is indispensable for successful language use. Certainly, students need to acquire a lexicon to build the blocks of language learning and communication (Richards & Rodgers, 2001). As Wong and Yunus (2020) affirm, the correlation between vocabulary size and language competence is appreciable.

Vocabulary learning for EFL demands practice and face-to-face interaction with teachers and peers. However, the COVID-19 pandemic and the confinement situation affected education since both students and teachers were forced to transition from traditional classroom teaching to online instruction (Dhawan, 2020; Rajab et al., 2020). Teachers and learners had to use technological resources in virtual learning environments to enhance vocabulary and other linguistic skills. In this context, EFL vocabulary was taught using technological resources such as different applications and platforms (Odinokaya et al., 2021; Castillo-Cuesta, 2022). Alsied and Pathan (2013) acknowledge that technological tools are effective for learning new words; these authors assert that students learn vocabulary significantly faster when using technology. One of the technological tools for learning vocabulary is ToonDoo, which is an online resource that enables learners to design digital comics, foster their e-collaborative learning, and share their ideas online without stress since it permits them to convey what they think easily and confidently (Robles 2017). As Fatimah et al. (2019) assert, ToonDoo is an appealing web-based application that can be used by teachers as an instructional tool to create online comics through a user-friendly interface for teaching.

Several studies have analysed the use of digital comics for EFL learning. Ayar and Kiziltan (2020) conducted a study to determine the influence of cartoons on vocabulary learning strategies of Turkish EFL learners. Their findings revealed that the most common vocabulary learning strategies were determination and metacognitive strategies. Fatimah et al. (2019) explored the use of ToonDoo and its benefits in teaching English short stories; they evidenced that this tool allowed instructors to produce cartoon strips efficiently and share them with learners. Cabrera et al. (2018) aimed at examining the use of Pixton for teaching grammar and vocabulary and demonstrated that Pixton is a powerful instruction resource that encourages students to enhance grammar and vocabulary in an entertaining mode. Ahmadi et al. (2017) explored the impact of children’s comic strip stories on incidental vocabulary learning. Their results revealed that listening to comic strip stories had statistically meaningful effects on students’ vocabulary learning. The purpose of research conducted by Robles (2017) was to assess the implementation of ToonDoo as a resource for collaborative e-learning and evidenced that the learners’ attitudes to the use of digital comics were positive.

Though prior research has explored both the use of comics for language learning and their use for practising some skills, none of the research has engaged in the use of digital comics for enhancing EFL vocabulary during the COVID-19

pandemic. The significance of the present study is to offer insights into this field, which might be beneficial for learners who have not had the chance to acquire new vocabulary in an innovative form through implementing activities using technological tools. Therefore, the following research questions were considered:

1. What is the impact of using digital comics on EFL students' vocabulary learning?
2. What are the students' perceptions of using digital comics to learn EFL vocabulary?

2. Literature Review

2.1 EFL Vocabulary Learning

Vocabulary has been defined as the lexis or the words of a particular language (Wehmeier et al., 2005). In language learning, the significance of vocabulary is evident since word knowledge is essential to develop the students' competencies as well as their comprehension and production; certainly, the four language skills are all based upon the learners' vocabulary acquisition (Bai, 2018). As Dakhi and Fitria (2019) affirm, vocabulary is the heart of linguistic skills because it contributes to the development of receptive and productive skills. Therefore, "lexical knowledge is central to communicative competence and the acquisition of a second and foreign language, and a lack of vocabulary knowledge is an obstacle to learning" (Alqahtani, 2015, p.31). Since vocabulary is a foundation and a key element of language acquisition (Banca & Tongtep, 2021), deficient vocabulary creates learning difficulties and poor English proficiency (Ocampo & McNeill, 2019).

Vocabulary learning for EFL involves great skill on the part of an individual for processing words of a language (Rivers, 1989); knowing words is essential for EFL students. In this respect, Nation (2012) emphasises that the knowledge of a term involves recognising the form, meaning, and use of the term. The form is related to spoken form, written form, and word parts; meaning entails concepts, referents, and associations; finally, use includes structural functions, collocations, register, and frequency. Pignot-Shahov (2012) acknowledges the importance of receptive and productive knowledge for language learners; this author states that, "receptive knowledge is being able to understand a word in its spoken or written form, and productive knowledge means to be able to use a word correctly in a written work or a speech" (p. 43). In the same way, Pignot-Shahov (2012) affirms that learning a word productively involves teaching it productively, and the same goes for receptive vocabulary knowledge.

Learning EFL vocabulary is certainly challenging. Susanto (2017) states that, "learning vocabulary items is not such a simple matter of committing them to memory, but how to use them in appropriate situations as well as how to expand the knowledge of one's vocabulary is also crucial" (p.189). Vocabulary acquisition involves more than just memorising the spelling and pronunciation of a word; it includes other dimensions such as pronunciation, meaning, word formation, collocations, etc. Thus, students need to use strategies for learning vocabulary; these strategies depend on their level, age, and needs (Susanto, 2017). As Putra (2016) asserts, the more successful teaching strategies the instructor applies in the

EFL class, the better the learners' linguistic skills become. Teachers should, therefore, consider the aspects and train their students to use effective strategies and resources for successfully learning the new words of the target language.

2.2 Technology for EFL Vocabulary Learning

Technology has offered very important tools to support education (Seliaman & Al-Turki, 2012). Language learning is not an exception, which is why Sa'd (2014) asserts that electronic devices and their resultant usage have a noteworthy place in linguistic instruction. Alsied and Pathan (2013) affirm that technology has become a very important part of our lives for all the activities people do in the world; certainly, foreign language instruction is one of the fields that has experienced a great impact in this digital era. Saleh and Pretorius (2006) had already acknowledged the importance of the role of technology, computers, and the Internet in language teaching and specifically in the context of English teaching and learning. In fact, technology offers some advantages for EFL students; Alsied and Pathan (2013) emphasise that there are many benefits derived by implementing Information and Communication Technology (ICT) to teach, learn, practise, and assess a foreign language, especially in the EFL contexts in which students do not have enough opportunities to practise the target language.

Many resources and applications are available for enhancing the different language skills and sub-skills. In the case of the listening skill, technological tools allow EFL learners to use authentic video and audio resources; moreover, many useful websites offer numerous listening exercises and testing materials for free (Alsied & Pathan, 2013). Concerning speaking, technology offers students the possibility of learning, improving, practising, and assessing their speaking skills; they can use the internet on computers, tablets, and smartphones to chat and talk with native speakers in a friendlier foreign language environment. Social networking sites such as Skype, Nimbuzz, Yahoo, and Facebook permit audio and video talk; the activities using online tools for speaking are very useful for improving fluency and pronunciation (Payne & Whitney, 2002). With regard to reading and writing skills, technological resources provide a variety of current and authentic reading materials and writing tools that are very effective for developing these skills.

Vocabulary, which is essential for listening, speaking, reading, and writing can also be enhanced through technological tools; in this respect, Alsied and Pathan (2013) acknowledge that computer assisted language learning (CALL) programmes are effective for learning new words; in addition, these authors affirm that the use of technological resources can effectively help students learn vocabulary significantly faster than through traditional resources. Similarly, Jariah et al. (2019) assert that the use of ICT allows learners to acquire vocabulary efficiently, which has an overall effect on mastering EFL skills. Certainly, learning new words through implementing activities by means of web-based applications has a positive effect on students' vocabulary improvement across ages and contexts (Yang et al., 2021). One of the advantages of learning the target language

vocabulary through different technological tools is related to the improvement of the learners' long-term retention of new words (Hao et al., 2021).

2.3 Comics for Vocabulary Learning

Learning vocabulary is an essential part of language and a process in which learners use different strategies and resources. In this context, comics are one of the didactic resources that play an important role in learning vocabulary since the combination of their elements (images and text) helps learners memorise and remember a word, expression, or concept more easily (Csabay, 2006). Comics are stories in which pictures and several words are included (Marianthi et al., 2016). The use of pictures allows students to create a story by generating ideas without difficulty and in chronological order (Darsalina et al., 2016). Comics are thus a great form of visual communication that helps students enhance their vocabulary more easily. Fatimah et al. (2019) confirm that comics combine pictures, text, and other visual information components that permit learners to receive information as well as express ideas.

The two elements of comics, the written words and visual concepts together, as well as other characteristics, help students to easily remember the words they studied in class. In this regard, Tiemensma (2009) points out that the language in comics, which is usually brief and much simpler than it is in other types of texts, contributes to recalling the vocabulary that students have learned. All these elements promote students' engagement and motivation to learn vocabulary. Furthermore, Wright (2003) asserts that the use of comics has many advantages, such as improving students' learning, enhancing students' communicative and competencies, increasing learners' attention and students' engagement, among others.

ToonDoo was one of the free and fully online comic creators that allowed learners to improve their vocabulary because of its characteristics. It has many functions for creating and personalising comics (Figure 1). These benefits make students feel more confident and more motivated to use comics for their vocabulary learning. Kirchoff and Cook (2015), describe ToonDoo as an easy, powerful, free, and engaging web-based application for creating comics in a user-friendly interface. The application provides the option of showing the characters' emotions such as happiness, anger, sadness, or disappointment (Fatimah et al., 2019).



Figure 1: ToonDoo Features (ColaborAulaTIC, 2022)

2.4 Previous Studies on the Use of Comics in EFL Learning

A number of studies have been conducted on using comics to enhance English vocabulary. Ayar and Kiziltan (2020) carried out quasi-experimental research to examine the effect of cartoons on vocabulary acquisition strategies of Turkish EFL learners who worked with three English literature classics, *Treasure Island*, *Great Expectations*, and *Romeo & Juliet*. A vocabulary learning strategy test was administered to reveal students' preferred strategies. The control group consisted of 20 participants who were randomly selected and who worked on excerpts in plain text without any cartoons, while 47 students in the experimental group had the opportunity to work with cartoons. The findings revealed that the most frequent vocabulary learning strategies used by the experimental group were determination and metacognitive strategies, while the control group mostly used memory, social and metacognitive strategies. The results demonstrated different gender strategies: girls practised determination and memory strategies, whereas boys preferred social, metacognitive, and cognitive strategies.

Fatimah et al. (2019) carried out a study on the use of ToonDoo for teaching English short stories, and the advantages of this resource in EFL instruction. The participant was a pre-service teacher, who created a reflection journal at three points: after ToonDoo was introduced; after he created ToonDoo cartoons; and after he taught, using ToonDoo for teaching short stories. The researcher created a reflection template for writing the journal and the participant was interviewed to analyse the process of making cartoons and the process of instruction using ToonDoo. The results showed that this web-based resource enabled instructors to design comic strips easily and share them with learners. This resource can be useful in improving learners' speaking skills. ToonDoo can be effectively applied to engage learners' imagination and increase their ability to express their thoughts in the target language, thus creating a meaningful learning experience and a confident classroom environment.

Calisto-Miranda et al. (2018) conducted research in Chile, the purpose of which was to investigate the participants' performance before and after a comic-based instructional sequence for teaching EFL vocabulary. Seventeen and ten students from two educational institutions participated in the study which involved intervention sessions (called Vocabulary Through Comics) for teaching new words. The participants had the opportunity to receive comic-based training, including classroom activities for producing comics based on the words learned in the lesson. Pre- and post-tests were administered before and after the implementation process. The findings revealed that there was a statistically substantial difference between the pre- and post-test scores. The researchers concluded that using comics as a teaching approach was successful because the participants demonstrated that they had improved their knowledge of new words in the target language.

The quasi-experimental study conducted by Cabrera et al. (2018) aimed at examining the impact of using the technological tool, Pixton, to improve grammatical and lexical instruction. The sample comprised 163 junior high school students. They were organised into a control group of 78 participants and an

experimental group of 85 learners. The students in the control group received their regular instruction without the use of Pixton resources, whereas the participants in the experimental group used supplementary materials designed with Pixton. The data were collected through surveys, observations, and pre- and post-tests. After quantitative and qualitative data analysis, findings showed that the use of Pixton had a significant influence on the participants' grammar and vocabulary knowledge; in addition, participants considered that using this tool was motivating and beneficial for their learning.

Ahmadi et al. (2017) explored the influence of children's comic strip stories on incidental vocabulary learning. The participants were 40 Iranian beginner learners who were organized into an experimental group (20 learners) and a control group (20 learners) on the basis of their shared similar linguistic and background knowledge. All participants' knowledge was measured through a pre-test, a post-test, and a scale of vocabulary knowledge (VKS). The participants in the experimental group had the opportunity to listen to the comics and work with them. The results show that listening to comic strip stories had a statistically meaningful effect on both groups of students' vocabulary learning. The findings revealed a substantial difference in the vocabulary score between learners in the experimental group and those in the control group.

The purpose of the research conducted by Robles (2017) was to evaluate the implementation of ToonDoo as a resource for collaborative e-learning and to identify its impact on the learners' performance. The participants included 44 purposely selected third-year students at Mindanao State University, General Santos City. The researcher used a mixed-method approach which involved observations, experiences, and the participation of designated key respondents in focus group exchanges. The aforementioned activities were cross-validated with accessible secondary information and other associated registers. Findings revealed that the learners had positive responses regarding the implementation of digital comics. The results demonstrated that the use of this tool positively affected the participants' learning.

3. Method

3.1 Research Design, Setting, and Participants

A quasi-experimental design was used in this study. This approach involved participants who were not randomly assigned to a group but were already part of a group established before the intervention (Fernández, et.al, 2014). The present research was conducted in three of the four regions of Ecuador. The participants were 262 public high school students (156 female and 106 male) whose ages ranged from 12 to 14 years. They were divided into control (128) and experimental (134) groups. The participants were enrolled in the eighth and ninth years of Educación General Básica Superior. These EFL learners belong to the A1 level of proficiency of the CEFR (Council of Europe, 2001) and the regulations by the Ecuadorian Ministry of Education (2016).

3.2 Research Instruments

Table 1: Research instruments

Instrument	Purpose	Number of items
Online pre-test	Used to assess the participants' vocabulary knowledge.	20 multiple-choice items according to the students' proficiency level.
Online post-test	Administered to determine if there were substantial differences between the scores of the control and experimental groups in vocabulary learning. It included the same components as the pre-test.	20 multiple-choice items according to the students' proficiency level.
Perception questionnaire	Applied to understand the students' opinions of the use of digital comics during the workshops as a resource for improving vocabulary learning.	Eight items for eliciting answers on a Likert scale.

The instruments were pilot-tested with 45 EFL learners; using Cronbach's alpha, the instruments obtained a reliability score of 0.75.

3.3 Procedure

This study was carried out for three months during which time students received explicit vocabulary instruction. Before the implementation, all participants completed a pre-test. Based on the pre-test results, six workshops were planned and carried out via the Zoom platform because of the COVID 19 pandemic. The one-hour workshops were offered twice a month. Although both groups participated in the workshops, the experimental group had to complete activities to learn and practise vocabulary using digital comics, whereas the learners in the control group used supplementary resources and the textbook developed by the Ecuadorian Ministry of Education. Initial training for using digital comics was offered for the students in the experimental group as well as continuous guidance for solving any difficulties participants faced during the workshops.

After the intervention, students took a post-test that allowed the researchers to determine whether the results of the students in both groups exhibited any differences in vocabulary acquisition. In addition, the students' perceptions regarding the use of digital comics during the workshops were investigated by a questionnaire that was given to the participants in the experimental group. All the gathered data were analysed quantitatively using a t-test to determine whether there was a significant difference in the student's pre-test and post-test scores within and between groups. The analysis of the results allowed the researchers to answer the research questions and draw conclusions.

4. Results and Discussion

4.1. Impact of Using Digital Comics on EFL Students' Vocabulary Learning

Statistical analysis showed that the students' vocabulary performance differed significantly in favour of the experimental group who were exposed to using digital comics. The pre-test and post-test scores displayed statistical differences

which indicated that using digital comics enhanced students' vocabulary, particularly during the pandemic. The pre-test results evidenced a slight difference (0.22) between the control (5.62 out of 10) and the experimental (5.84) groups. However, the post-test scores (Table 2) demonstrated a significant improvement (2.81 points of difference) for the experimental group (8.88 out of 10) compared to the control group (6.06). These results show that using digital comics had a positive impact on EFL the vocabulary learning of the students in the experimental group. These findings align to those of Calisto-Miranda et al. (2018) in which pre- and post-test scores demonstrated that comic-based instruction was effective in learning vocabulary. Likewise, Erina et al. (2017) proved that teaching new words by using comics improved the learners' vocabulary acquisition and created a good learning atmosphere.

Table 2: Post-test results

Post-test		
Group	Experimental	Control
Mean	8.8880	6.0667
SD	9.4245	1.6283
P-value = 0.0434		

4.2. Student Perceptions of the Use of Digital Comics to Learn EFL Vocabulary

Table 3 provides analysis of the data gathered in the perception questionnaire concerning the second research question related to the students' opinions of the use of digital comics for improving EFL vocabulary learning.

The majority (78%) of the participants strongly agreed that digital comics were useful for learning EFL vocabulary. Certainly, digital comics helped students remember new words easily and enhanced their creative skills (Wilujeng & Lan, 2015). Likewise, 82% of the students perceived digital comics as an original resource that allowed them to acquire new EFL vocabulary. With regard to motivation, most of the students (68%) found that this resource motivated them to learn new words in the target language. This finding corroborates Velandia (2016) who found that using digital comics was strongly motivating for students because it allowed them to learn the target language in an enjoyable way. Fatimah et al. (2019), too, acknowledge that digital comics promote the students' intrinsic motivation to learn and benefit from this technological resource.

In terms of the quality and image resolution of digital comics, the participants strongly agreed (78%) that these characteristics were engaging aspects when learning vocabulary. These findings align with those of Puspasari (2019) which evidenced that the use of digital comics motivated learners, fostered their interest, and facilitated EFL learning in a confident atmosphere. In addition, Wilujeng and Lan (2015) affirm that digital comics make a course more entertaining and facilitate language learning.

Most of the learners (66%) confirmed that they had the opportunity to learn vocabulary in context using digital comics. As for the creation of personalised characters, 68% of the participants strongly agreed that this aspect of digital comics allowed them to create their cartoons by using the components of web-based application tools such as the selection of characters, props, clip art, and text bubbles (Tahsaldar & Semaan, 2018; Fatimah et al., 2019).

Concerning the design of scenes in digital comics, 71% of the students strongly agreed with the benefits of this characteristic. The opportunity to create different settings for their comics increased their motivation to study (Fatimah et al., 2019; Wilujeng & Lan, 2015). Velandia (2016) has also shown that digital comics are beneficial because they allow students to clarify an idea from verbal or textual display to visual display, and then create their unique representation of an idea. Most participants (63%) expressed their willingness to continue learning EFL vocabulary using digital comics. This implies that the use of digital comics increased the participants' motivation to enhance their vocabulary learning and linguistic competence.

Table 3: Students' perceptions of the use of digital comics

Items	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Digital comics were useful for learning EFL vocabulary.	78%	12%	7%	3%	0%
Digital comics were an original resource for learning EFL vocabulary.	82%	10%	7%	1%	0%
I felt motivated when using digital comics.	68%	24%	5%	2%	1%
I liked the quality and image resolution of digital comics.	78%	12%	7%	2%	1%
I could learn EFL vocabulary in context through the use of digital comics.	66%	10%	18%	5%	1%
I could create personalised characters through the use of digital comics.	68%	13%	12%	5%	2%
I could design scenes using digital comics.	71%	15%	10%	3%	1%
I would like to continue learning EFL vocabulary by using digital comics.	63%	19%	15%	3%	0%

5. Conclusions

Digital comics have a positive impact on EFL vocabulary learning. The results of the post-test provide remarkable evidence that the use of digital comics enhanced the vocabulary performance of the experimental group, particularly during the COVID-19 pandemic when an innovative strategy for EFL vocabulary acquisition was necessary to enhance students' learning.

Students considered that the use of digital comics was an original, useful, and motivating way to enhance vocabulary knowledge, implying that when selecting tools for creating digital comics to learn EFL vocabulary, these characteristics should be considered for successful implementation.

The quality and image resolution, the option to create personalised characters as well as the design of settings were some of the advantages participants regarded as valuable when using digital comics for learning EFL vocabulary in context. This implies that students enjoy using tools that allow them to customise their own digital stories and use recently learned vocabulary.

Learners' insights regarding the use of digital comics to improve EFL vocabulary acquisition were predominantly positive, and they are likely to continue using it for improving their linguistic skills.

Since this study was conducted under the COVID-19 pandemic conditions in which the workshops were developed through Zoom meetings, the main limitation was access to good-quality internet connections. Further research might consider the use of digital comics for teaching specific linguistic skills in on-site learning environments.

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