María Paulina Amoroso-Vivanco; Melita Vanessa Vega-Auquilla

Measuring anxiety among young English language learners: Application of digital games for evaluation

La ansiedad en jóvenes estudiantes del idioma Inglés: Evaluación con juegos digitales

María Paulina Amoroso-Vivanco
maria.amoroso.68@est.ucacue.edu.ec
Universidad Católica de Cuenca, Cuenca
Ecuador
https://orcid.org/0000-0002-5735-0859

Melita Vanessa Vega-Auquilla
melita.vega@ucacue.edu.ec
Universidad Católica de Cuenca, Cuenca
Ecuador
https://orcid.org/0000-0002-6501-4011

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ABSTRACT

The purpose of the following study was to evaluate how the impact of technology affects the anxiety of elementary school students in English classes in a private school in Cuenca, Ecuador. Through a mixed method approach using the Beck Anxiety Inventory (BAI). Results showed that students experienced a statistically significant decrease in anxiety after being assessed through Quizizz games compared to traditional pencil-and-paper assessments. It was also found that students' anxieties regarding assessments were primarily triggered by fear of consequences, failure, and not achieving perfect scores. Further research over longer periods is recommended.

Descriptors: Educational psychology; educational guidance; language instruction. (UNESCO Thesaurus).

RESUMEN

El propósito del siguiente estudio fue evaluar como el impacto de la tecnología afecta en la ansiedad de estudiantes de primaria en las clases de inglés en una escuela privada en Cuenca, Ecuador. A través de un enfoque de un método mixto utilizando el Inventario de Ansiedad de Beck (BAI). Los resultados mostraron que los estudiantes experimentaron una disminución estadísticamente significativa en la ansiedad después de ser evaluados a través de los juegos Quizizz en comparación con las evaluaciones tradicionales con lápiz y papel. También se encontró que las ansiedades de los estudiantes con respecto a las evaluaciones se desencadenaron principalmente por el miedo a las consecuencias, el fracaso y no lograr calificaciones perfectas. Se recomienda más investigación durante períodos más extensos.

Descriptores: Psicología de la educación; orientación pedagógica; enseñanza de idiomas. (Tesauro UNESCO).

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INTRODUCTION

Many people experience anxiety when they feel evaluated, whether the evaluations are formal such as a grammar or proficiency test, or informal, as in the case of being selected to be part of a soccer team or get a new job. The experience of being assessed often gives people feelings of stress and fear of disapproval or being criticized as many individuals reveal strong and stable fear regarding the consequences of being evaluated. According to (Donaldson. et al. 2002), the dread of the possibility of a negative assessment is most likely intrinsic to being human. Analysis, criticism, hatred, shame, loss of worthiness, loss of regard, and dismissal are disagreeable encounters many people endeavor to stay away from (Reichenberger. et al. 2018) argued that such articulated feelings of dread of assessment are displayed to oblige adverse results in a few areas of social, passionate, and intellectual working situations.

This problem affects people equally, no matter where they are from or what their ages are. Leitenber (1990) has shown that social-evaluation anxiety can adversely affect children as well as adults and that it seems to affect both men and women nearly equally. (Wong et al. 2020a) believe Social Anxiety Disorder (SAD) contains a serious horror reaction in a social situation where there is a potential evaluation by others. Due to its chronic and debilitating nature, SAD is considered to be a high-impact mental disorder with a significant impact on the individual and social levels.

For students, fear of evaluations has always been an issue This disorder is characterized by the anxiety of falling. Students usually get stressed when they know there is a test coming up and this is also one of the main reasons for them to fail them. Research indicates that if teachers lower students' anxiety, they will acquire better results while they learn and get evaluated. The use of technology in the English classroom such as digital games has shown that it generates more engagement in the classroom, connects students to their learning, and helps educators apply blended learning (Krashen, 1985).

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However, there is more research needed to measure the effectiveness of digital games to lower students' anxiety.

The following experimental study examined the effect of digital games on the anxiety levels of students from 5th to 7th grades during English class evaluations at a private elementary school.

RESEARCH QUESTION

The general objective of this research was to analyze how technology affects the anxiety of students during English class evaluation. To this purpose, the following research question was addressed in the present study:

1. How does the use of digital games impact the anxiety levels of students from 5th to 7th grades during English class evaluations?

THEORETICAL FRAMEWORK

The Affective Filter Hypothesis

The link between anxiety and second language acquisition has roots in Krashen's Affective Filter Hypothesis (1982), which claims that students' anxiety, low self-esteem, or lack of motivation can lead to psychological barriers and prevent successful second language acquisition. To create a learning environment that makes students more motivated and less anxious, and to reduce "impact filters", the chances of successfully achieving SLAs are greatly improved. The entire emotional channel is unable to think clearly, which prevents learners from using the understandable information they obtain to protect the language. The moment this happens, the learner can get what he has heard and checked, but the information will not reach the language acquisition device.

Although "motivation" is a term often used in education and research settings, surprisingly, there is little agreement in the literature on the exact meaning of this concept. (Dornyei,

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2009) states that motivation determines human behavior by motivating itself or getting it from an external resource, but the various reports in the literature on how this happens may surprise experienced researchers.

Krashen (1982) has pointed out that motivation, self-confidence, and anxiety are effective elements that turn into emotional variables that have an indirect effect on students' learning process by blocking input from reaching the area of their brain responsible for language acquisition. In other words, when emotional filters are high, students may struggle with nervousness, tension, and mistrust of themselves and their abilities, which hinders their success. In contrast, a lower filter reduces these feelings, thus aiding students in understanding input more easily.

In pedagogy, Krashen's assertions help build a strong case for teachers to lower anxiety in their students, or more specifically according to Krashen, lowering the affective filter to facilitate language input. In the English language classroom, this means teachers, by focusing on information and ignoring form, can help students lower their anxiety. With this theory in mind, it can be inferred that English will improve because, with the filter lowered, information will be attained and learners will be more willing to participate in class assignments or evaluations.

Social anxiety and fear of judgment

Social anxiety is a personality change and tends to respond to social stimuli with irritability, nervousness, and discomfort, while the fear of being judged negatively is an essential characteristic of social anxiety as a directional personality trait (Leary, 1996). Compared to other forms of anxiety, in addition, social anxiety can also be called evaluative anxiety or "fear of judgment" because it involves interpersonal judgment in real or imagined social contexts (Watson & Friend, 1969).

Social anxiety is a common occurrence at one time or another as most people have experienced some degree of anxiety related to a social situation. This anxiety occurs when

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people fear negative opinions or feel they have failed and is a concern because it causes self-consciousness and emotional distress in anticipated or actual social-evaluative situations. According to (Leitenberg, 1990), this can occur just before giving a speech; after doing or saying something considered shameful or humiliating; when trying to arrange a date with an attractive person of the opposite sex for the first time; attending a party or social function without knowing the guests or hosts very well; during a job interview; upon receiving criticism or expressing disagreement with authorities; or when feeling weak, or stupid, or in some way ridiculous.

Theory of Foreign Language Anxiety

Given the fact that the learning language process is particularly remarkable, FLA is defined as the unique and complex structure of self-cognition, emotions, beliefs, and behaviors that emerge in the context of foreign language learning (Horwitz et al.,1986). From clinical experiences, the researchers found that personal feelings, psychophysiological symptoms, and behavioral responses of students eager to learn a foreign language are basically the same as for any particular anxiety. For this reason, they feel anxious, worried, and even fearful; they also have trouble concentrating, can become forgetful, sweat, have heart palpitations, and exhibit avoidance behaviors such as absenteeism and delayed homework.

Language anxiety is caused by three performance-associated factors: 1) nervousness of being judged negatively, 2) reluctance to communicate and 3) exam-related anxiety. Fear of adverse reviews is the feeling of being apprehensive about others' judgments, avoiding judgmental situations, and expecting others to judge you negatively. These causes are associated with interpersonal problems and particular characteristics, similar as fear of speaking foreign languages, poor grasp of foreign languages, and low self-esteem (Mahmoodzadeh, 2013).

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Evaluation is one of the biggest fears for foreign language learners because of the fear of failure (Alrabai, 2014) explains students who have to study English as an obligatory course with the only objective of passing examinations rather than actually increasing their knowledge and using the language experience more anxiety and tend to have a lower motivation to learn English. With other authors supporting the notion that there is generally a negative correlation between anxiety and performance (Amy & Anastasia, 2015), it can be stated that research supports the theory that anxiety related to foreign language learning is specific and unique in and of itself derived from the singular circumstances of foreign language learning.

STATE OF THE ART

The literature on foreign language anxiety offers six major categories: "1) interpersonal and private anxiety, 2) learners' ideals approximately gaining knowledge of the overseas language, 3) school room procedures, 4) using teacher-targeted methods, 5) teachers' ideals approximately language coaching and 6) language examination" (Young, 1991, p. 427) (Lou, 2012) found that the main sources of anxiety about foreign languages are classroom atmosphere, learner attributes, target language, and the language literacy process itself. More recently, (Anwar & Abdullah, 2021) indicates, anxiety is commonly divided into two categories: learner factors and situational factors. Attitudes like self-confidence, age, personality or gender, and motivation are some elements that influence students.

Several suggestions have been proposed to reduce and eliminate, as much as possible, the effects of foreign language anxiety on learners. It has been said that not only teachers should pay attention to this problem, but the whole institution as well. If the classroom settings are inadequate to take reasonable risks and there are few opportunities to create a target language, it will be more difficult for students to develop any skills. The challenge for teachers is to create conditions that allow students to have more opportunities to

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communicate in their target language in a relaxed and supportive environment. Fostering a collaborative learning environment has been shown to reduce anxiety (Kagan, 1994) and recent studies have shown that the use of technology and games can also be effective.

Several authors have found that the use of computers in language learning has significantly improved participants' attitudes towards learning (Ayres, 2002). Gamification, in particular, can provide a rich learning context to help learners build knowledge at a higher level, through the opportunity of ambiguous and rewarding trial and error. Through games, students can learn in exciting and entertaining ways while expanding their knowledge and understanding of a new language (Wong, 2020). Consequently, the use of educational games to supplement teaching and learning has steadily increased over the past few years, with evidence pointing to greater effectiveness in the English language classroom through the use of games versus non-gaming learning environments (Dehghanzadeh, et al, 2019). Gamification can be applied to many aspects of education, including education and evaluation. As is well known, most students enjoy playing games since they had played them most of their lives (Pitoyo, et al, 2019).

Gamification has been adopted in a classroom context to support learning in a variety of contexts and subject areas to help educators address students' attitudes and behaviors, such as participation, collaboration, self-guided study, and creativity. Gamification has also been used by educators as students' assignments and assessments while encouraging their exploratory approaches to learning, and classroom retention. This is because the game elements would engage learners and change their behavior in a desirable way similar to what happens in games. Furthermore, considering the possibilities of using digital games as an educational or evaluation tool, quantifiable achievement or performance must be investigated to determine whether the educational approach is successful or not (Vandercruysse et al. 2012). Digital games are considered

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as a new form of an instructional tool with the great potential to effectively enhance learning performance.

A recent study conducted in Indonesia with a sample of 14 students in an English course found that test anxiety will always be present in students because of their fear of failing. Consequently, the researchers used Quizizz to assess students and see their reactions toward an online assessment and found the result encouraging because it showed they lower their anxiety because of the use of game elements (Pitoyo et al, 2019).

METHODOLOGY

Study Design

A sequential exploratory strategy was used in the present study, as the objective was to measure students' anxiety levels before and after an intervention that involved using a regular for the first term (9 weeks) from September to October 2021 and Quizizz for the second term (9 weeks) mid-October to January 2022 for English evaluations. The first phase featured quantitative data gathering that was done before each type of assessment, which was later followed by a qualitative phase in which study participants were interviewed to assist in the interpretation of the results obtained in the quantitative phase.

Participants

The sample was comprised of 123 students ranging from 10 to 12 years of age in Pasos Elementary School (5th, 6th, and 7th grades), located in Ecuador. The decision to include students from different grades was due to the application of a dual model of instruction in response to Covid-19 restrictions in place at the time of the study.

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Data gathering tools

For the quantitative phase of the study, the Beck Anxiety Inventory (BAI) was used in Spanish to assess students' anxiety levels caused by English evaluations. The BAI, developed by Aaron T. Beck, MD (Beck et al. 1988) and used in the psychological department of the school where the study took place, is a rating scale used to evaluate the severity of anxiety symptoms. It has been found to differentiate well between anxious and non-anxious diagnostic groups and has been used extensively among students of different ages. The scale contains 21 items to measure anxiety, and offers the option to select one of three ratings (see Table 1): 0 (Not at all), 1 (Mildly, but it didn't bother me much), 2 (Moderately, it was not pleasant at times), and 3 (Intensely).

Table 1.
BAI rating scales.

Not at all	Mildly	Moderately	Intensely
0	1	2	3

Source: Beck et. al (1988)

For each item, the students were asked to report how they felt before they took their English evaluations. The BAI offered a numerical score for each student's anxiety levels depending on the different types of English assessments. The total score was calculated by finding the sum of the 21 items. Table No. 2 shows the scores that indicate low, moderate, and potentially concerning levels of anxiety.

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Table 2.
BAI scores.

0-21	low anxiety
22-35	moderate anxiety
more than 36	concerning levels of anxiety

Source: Beck et. al (1988).

A guided interview in Spanish was also conducted among learners after the intervention with fourteen open questions to probe their opinions about their anxiety levels. Participants were asked questions about their knowledge of anxiety and its symptoms, their perceptions about the use of games for formal evaluations, their likes and dislikes when teachers use games to assess, and their preferred evaluation methods.

PROCEDURE

The pre-study process included securing permission from the school principal to proceed with the research, followed by sending a consent form to parents explaining the purpose of the study and noting the confidentiality of the results.

The quantitative phase began in October 2021 with the application of the BAI tool (see Appendix A), which was administered on paper in person followed by the English evaluation, also completed on paper. The paper evaluation included questions where the students had to write their answers about their knowledge of vocabulary, listening, reading, and grammar used to evaluate the first term of the English language program textbook. In January 2022, for the second term, the institution decided to have an online day for all students so they could apply the game evaluation from home; consequently,

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the BAI questionnaire was applied using Google forms before an online Quizizz assessment that included vocabulary, grammar, listening and reading, in which students had to play and choose the correct answers.

The qualitative phase of the study took place after the second term, once the second evaluation was finished. Guided interviews took place with 12 students chosen at random from all levels to explore their perceptions of the levels of anxiety that faced. All this procedure took place between August 2021 and February 2022.

RESULTS

Quantitative data

Quantitative data was gathered using the BAI questionnaire before the first term regular test; two months later the same BAI questionnaire was applied before the second term gamification test. The data was processed in the SPSS software program using the Wilcoxon Signed Ranks test, which is considered suitable for scenarios where a sample undergoes a measurement, an intervention, and another measurement and where the data does not follow a normal distribution (such as test scores) (McDonald, 2014). A null hypothesis was declared in that there would be no difference between the test scores. A 95% confidence rate was established (or a critical value of 0.05) to aid in determining whether the numerical differences between the BAI test scores were statistically significant. In this scenario, a p value closer to zero will result in the rejection of a null hypothesis (Doane, 2021).

Table 3 provides a descriptive breakdown of the data and a calculation of the mean BAI test scores. Based on the figures, there was a numerical difference of 2.19 between the two mean scores. With both scores under 21, it can be observed that the students' mean anxiety scores in both the first and second BAI tests did not reach levels of moderate anxiety.

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Table 3.
Descriptive Statistics for participants from BAI a and BAI 2.

	N	Mean	Std. Deviation	Minimum	Maximum	Percentiles 25th	50th (Median)	75th
S_BAI 1	123	15,47	11,482	0	53	6,00	13,00	23,00
S_BAI 2	123	13,28	10,690	0	48	5,00	9,00	21,00

Table 4 shows 58.53% of the tests scores decreased while 34.14% increased and 7.30% remained the same. In the BAI test, a higher score indicates a higher anxiety level.

Table 4.
Ranks for participants from BAI a and BAI 2.

		N	%	Mean Rank	Sum of Ranks
S_BAI2 - S_BAI1	Negative Ranks	72[a]	58,53%	60,27	4339,50
	Positive Ranks	42[b]	34,14%	52,75	2215,50
	Ties	9[c]	7,30%		
	Total	123			

a. BAI2 < BAI1
b. BAI2 > BAI1
c. BAI2 = BAI1

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Based on the final calculation of the Wilcoxon Signed-Ranks test (Table 5), it can be observed that the p value is less than 0.05 (p=0.03), which means the decreases in the students' BAI test scores were significant and there was a reduction in anxiety at the end of the two-month intervention.

Table 5.
Wilcoxon Signed Ranks Test Statistics.

	S_BAI2 - S_BAI1
Z	-3.005[b]
Asymp. Sig. (2-tailed)	.003

a. Wilcoxon Signed Ranks Test
b. Based on positive ranks.

Qualitative data

Qualitative data were gathered through interview conducted with a group of 12 students randomly selected from different levels (5th, 6th, and 7th grade) ages from 9 to 12 years in Pasos Elementary School. Students were asked about their knowledge of anxiety, its symptoms, their opinions on regular tests, online game tests and particular preferences for each. A journal was also kept by the teacher to collect the perceptions of the students during these two months through the application of the evaluations.

In analyzing this information, the results showed that students didn't fully understand the concept of anxiety, as they related it more to the sensation of fear. Students explained they felt certain fear at the prospect of all kinds of assessments. One student said, "Every time I'm going to get tested my hands sweat a lot and I can even hear my heart." Another stated, "When the teacher is turning in the papers I start praying."

Because of the age range, the students seemed more afraid of consequences than failing. They noted they were not worried about knowledge; they were more concerned about

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grades and parents' approval. "I am afraid of getting bad grades because my parents will ground me," a student mentioned after taking a regular English evaluation. "I get too anxious to obtain good grades because they define how smart you are," said another student.

Perceptions between regular test and online evaluations

When discussing the two types of assessment, students mentioned they feel more stress-free taking an online evaluation. Others noted when they play, they forget that it is a test, so they feel more relaxed and when they are having fun, they don't feel anxiety. One student said, "Colors give life to things, that is why I love quizzes." In addition, learners mentioned they felt motivated during games because the pictures, power-ups, and redemptions questions during the game as well as the competition with their classmates helped them to achieve better results.

Regarding regular assessments, learners expressed they look too long. When they see so many pages, they noted they feel demotivated because writing all the answers takes too much time; in contrast, when playing a game, they only choose the correct answer and can't see how long the test is.

Finally, an interview was also conducted with the three English teachers from 5th to 7th grades about the use of online games for the assessment on young learners. They asserted that students can apply their knowledge by playing. One of the teachers expressed "Since they are little kids the fact of seeing many pieces of paper stress them… they are very relaxed when they play… plus, they are too worried about grades… they even cry when they get a bad grade because of the consequences in their houses."

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DISCUSSION

The study was conducted to determine the impact of digital games on the anxiety levels of students from nine to 11 years old during English class evaluations. The collected data reveals that students are anxious about all types of evaluations and they all feel fear at the prospect of getting tested. After an intervention in which students completed their first assessment, which consisted of a regular, written test, followed by a second assessment through the Quizizz platform months later, it was possible to observe that their mean BAI test scores remained in the category of low anxiety. Despite this, there was a statistically significant decrease in the students' mean BAI test scores, which leads to the interpretation that students were more relaxed during a game evaluation than they were during the traditional paper test, which appeared to generate more feelings of anxiety at the start of the intervention.

(Pitoyo et al. 2019) have found that anxiety during evaluations is common among students; nevertheless, the use of digital games such as Quizizz can effectively reduce test anxiety as it can serve as motivation for students to accomplish their goals with enthusiasm. A common feeling from students was the fear of consequences and acceptance, as they believe if they receive low grades, they will not obtain approval from their parents, or they will be grounded. Because of this mindset, students tend to focus their achievement on grades instead of learning, which can lead to increased levels of anxiety levels. This was a common feeling among students. They do not appear to be basing their goals on improving, but on getting better grades, so they won't feel less than their peers. The use of digital games in the English language classroom introduces elements of play and competition that lead students to forget they are under evaluation, relax and thus focus on improving their performance.

Interviews with teachers reiterated many of the same ideas expressed by the students, including concerns about anxiety levels and parents' approvals. Furthermore, they found that the use of games and projects to evaluate is easier for students and serves as an

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appropriate means of measuring their knowledge and creativity. Consequently, it can be concluded that the assessment of students through digital games in the English language classroom is an appropriate strategy to lower their anxiety and boost test performance.

LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

Many challenges were encountered during the study, particularly the changes brought on by the Covid-19 pandemic. First, learners, had to become accustomed to handling technology, followed by adjusting to a hybrid education system that involved receiving instruction online on certain days, and face-to-face instruction on other days, all while facing internet stability issues. While some comments given by the study participants alluded to these adjustments when speaking about academic stress, the study did not examine Covid-19 related issues and their possible effect on test-related anxiety.

Another study limitation was the timeframe; two months of separation between the two BAI tests may not have been enough to see a more of a significant difference between the BAI two scores. Future research may do well to apply a similar methodology over the course of an entire school year to determine whether longer periods of time using digital games can lower anxiety further. In addition, in analyzing students' points of view, it is recommended that school authorities analyze the way learners' knowledge acquisition is measured due to the anxiety produced, as it is often the case that scores resulting from traditional evaluation methods are not always a true reflection of real learning.

FINANCING

ACKNOWLEDGEMNT

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APPENDIX A

BAI
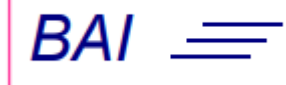
Nombre: .... **Fecha** ....

Grado: ....

Indique para cada uno de los siguientes síntomas el grado en que se ha visto afectado por cada uno de ellos durante la evaluación de Ingles. Elija de entre las siguientes opciones la que mejor se corresponda:

0 = en absoluto
1 = Levemente, no me molesta mucho
2 = Moderadamente, fue muy desagradable, pero podía soportarlo
3 = Severamente, casi no podía soportarlo

	0	1	2	3
1. Hormigueo o entumecimiento	○	○	○	○
2. Sensación de calor	○	○	○	○
3. Temblor de piernas	○	○	○	○
4. Incapacidad de relajarse	○	○	○	○
5. Miedo a que suceda lo peor	○	○	○	○
6. Mareo o aturdimiento	○	○	○	○
7. Palpitaciones o taquicardia	○	○	○	○
8. Sensación de inestabilidad e inseguridad física	○	○	○	○
9. Terrores	○	○	○	○
10. Nerviosismo	○	○	○	○
11. Sensación de ahogo	○	○	○	○
12. Temblores de manos	○	○	○	○
13. Temblor generalizado o estremecimiento	○	○	○	○
14. Miedo a perder el control	○	○	○	○
15. Dificultad para respirar	○	○	○	○
16. Miedo a morirse	○	○	○	○
17. Sobresaltos	○	○	○	○
18. Molestias digestivas o abdominales	○	○	○	○
19. Palidez	○	○	○	○
20. Rubor facial	○	○	○	○
21. Sudoración (no debida al calor)	○	○	○	○

TOTAL: [ ]   *A.F.* [ ]   *A.S.* [ ]