REVISTA CÁTEDRA

Educaplay: a gamification tool for academic performance in virtual education during the pandemic covid-19

Educaplay: una herramienta de gamificación para el rendimiento académico en la educación virtual durante la pandemia covid-19

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Abstract

This research is based on the use of the gamification tool Educaplay and its contribution to the academic performance of elementary school students. The objective was to analyze the use of Educaplay as a didactic resource within virtual education and how this process improves students' performance, taking into consideration the change of model and application of new methodologies within virtual classes. The methodology applied is of an experimental-exploratory type, through a quali-quantitative approach that was collected by applying a survey identified as pretest which was validated by Cronbach's Alpha statistic with a value of 0.842 and subsequently the application of the Technology Acceptance Model (TAM) as posttest; the activities were developed using the SAPIE methodology; the study population was 70 elementary basic education students to whom the experiment was applied based on gamification resource using the web tool Educaplay. The results of the research allowed to know if the students improved their academic performance with the use of gamification resources that motivate their active participation, collaborative work, and that the teacher is the one who generates his own resources, based on the needs of the students.

Keywords

Education, e-learning, gamification, academic performance, ICT, virtual education.

Resumen

Esta investigación se fundamenta en el uso de la herramienta de gamificación Educaplay y su aporte en el rendimiento académico de los estudiantes de Educación Básica. El objetivo fue analizar la utilización de Educaplay como un recurso didáctico dentro de la educación virtual y cómo este proceso mejora el rendimiento de los estudiantes, tomando en consideración el cambio de modelo y aplicación de nuevas metodologías dentro de clases virtuales. La metodología aplicada es de tipo experimental-exploratoria, mediante un enfoque cuali-cuantitativo que se recabó aplicando una encuesta identificada como pretest la cual fue validada mediante el estadístico Alfa de Cronbach con un valor de 0.842 y posteriormente la aplicación del Modelos de Aceptación de la Tecnología (TAM) como postest; las actividades fueron desarrolladas mediante la metodología SAPIE; la población de estudio fueron 70 estudiantes de educación básica elemental a quienes se aplicó el experimento basado en recurso de gamificación utilizando la herramienta web Educaplay. Los resultados de la investigación permitieron conocer si los estudiantes mejoraron su rendimiento académico con el uso de recursos de gamificación que motivan su participación activa, el trabajo colaborativo, y que el docente es quien genera sus propios recursos, basados en las necesidades de los estudiantes.

Palabras clave

educación, educación virtual, gamificación, rendimiento académico, TIC.

1. Introduction

The use of collaborative tools is linked to the technological field, which contributes to great changes to transform virtual environments into adequate spaces for students at different educational levels. Currently, teachers must be previously trained for the proper use of collaborative tools, leaving aside the traditional teaching model, where the student does not acquire new and innovative knowledge, while these tools will facilitate their learning, it is possible to access digital books and quick information.

The fundamental key to change the traditional educational model for a technological one is that both teachers and students are involved in the use of new tools to improve their

academic performance. These changes are reflected in the participation of each student, in a constant and significant learning, in the fluid communication between teacher-student, in the construction of new knowledge, guiding them to an autonomy so that they can develop by themselves. This does not mean that collaborative tools replace the work of the teacher, the classroom or the blackboard, but rather that they are a support that contributes to and enriches the students' knowledge to prepare them for a new virtual environment.

The use of tools in times of COVID-19 requires changes in educational practices directed at teachers. It is essential to point out that the use of these tools within the teaching processes, which are established by teachers in their curricular design and in the practices derived from the teaching-learning process, allows students to become consumers of these resources. It must be taken into account that students need the guidance and accompaniment of their teacher because they are the ones who motivate the use and discovery of these tools, allowing them to improve their competence and academic performance. Students will be able to handle these educational tools with ease, from anywhere in the world, wherever they are through any electronic device; a fundamental aspect for the correct use of resources in reducing the risks of COVID-19 contagion, regardless of the distance between the teacher and the student if there is meaningful learning (Ramandeep et al., 2021).

Education is undergoing an accelerated transformation because teachers are changing their role as providers, as knowledge is online and no longer needs someone to provide it. Students need someone to reinforce knowledge and guide teaching, for this reason, it is necessary to adapt to technology and the services it offers. Learning with the Educaplay tool is fun, interesting and playful, it is a tool that does not give place to traditional learning, where students feel open to the pedagogical process, achieving to deepen and solidify their knowledge with capacity for analysis and synthesis, contributing to meaningful learning to form useful people in society.

Teachers' performance is almost totally linked to the emotions that trigger their conduct and behavior. In this sense, teachers are not only considered as carriers of theoretical and conceptual contents, but as beings that change the educational and cognitive awareness of students, classes become a space charged with well-being and good relationships by transmitting positive emotions, in which the practice of values, the development and strengthening of affective communication also intervene. When teachers carry out their work in the most intelligent way possible, and with the student's well-being in mind, they are promoting the balance of the cognitive and emotional dimensions, since learning is not only theoretical content but also social and affective relationships (Jingcheng et al., 2020).

There are several factors why students feel unmotivated, and sometimes have lack of interest in a firm; therefore, the use of methodologies, strategies, resources and techniques appropriate to virtual education in a certain way will minimize these relevant factors in young university students. For a child or adolescent to excel in his or her studies, family dynamics are relevant if the family to which he or she belongs is functional, the children will reflect a high level of performance in the institution. However, if the family is dysfunctional, the children will have disadvantages in school and will have recurrent absences. It will be possible to notice the lack of rules along with violent actions towards the children within the family. Therefore, there will be a total lack of motivation for their studies, resulting in poor school performance and even dropping out of school (Min-Jeong and Joon-Pio, 2021).

2. State of the art

A student's performance depends on an institutional culture, which is driven by rules and norms for the entire educational community. It is possible to find institutions that are based

on discipline, that give priority to school performance in conventional areas, that guarantee high scores in their evaluations, and that develop students' individual talents and abilities such as creativity, reasoning, reading, etc. Therefore, families have the right to choose the education they prefer for their children, but it is their obligation to know each one of the subjects (Román-Calderón et al., 2021).

2.1 Education and the Pandemic

In times of pandemics, different forms of coexistence have emerged. People have learned to live in confinement as a necessary and obligatory way, with the intention of avoiding contagion and preserving the health of all inhabitants. However, this brings with it some consequences such as the reaction of collateral effects in adults and the negative effect on children as they are the most vulnerable in this situation. That is why the academic performance of primary school students has been decreasing more and more, due to the stress caused by the confinement, a reality that is currently experienced.

Children do not have free or adequate space, adequate technological resources and an optimal Internet connection to resume their classes in virtual mode. They are afraid of getting infected or of a family member catching the virus, and what is worse, they are afraid of losing a loved one. Because of all these factors, children stop thinking about their studies, do not do their homework, do not attend classes and their thoughts are focused on other situations, which will affect their student life in the long term (MINEDUC, 2020). Parents are the ones who play an important role in education, they are the ones who assume the role of teachers, give reinforcement to their children and make them feel self-confident so that the child has an optimal school performance at the end of the school year (Behl et al., 2021).

The implementation of the use of 3.0 collaborative tools in the educational environment has generated a much more meaningful and, above all, quality learning process. In the same way, the student will work autonomously in the construction of his knowledge, also allowing him to be much more investigative (MINEDUC, 2020).

In addition, the Mineduc points out that platforms have been designed for students to create their projects based on technologies, and that there are several online courses offered by the Ministry of Education with topics related to technological tools 3.0 (MINEDUC, 2020), which will facilitate learning. The main objective of creating these virtual platforms is that they motivate both the teacher and the student to be much more investigative and thus generate experiential learning (Nikoletta-Zampeta et al., 2021).

2.2 Collaborative tools

Collaborative 3.0 tools have grown rapidly in the last decade, so one must be responsible and use them appropriately. They have been implemented in the educational environment, generating a better teaching process with quality and warmth to each of the students, trying to train students with skills and abilities to face digital barriers (Zamzami et al., 2020).

Collaborative tools are computer applications that help to communicate and work in groups without the need to be together in the same physical space, thanks to these tools it is possible to share different information and perform activities in different areas. Collaborative tools are a system of applications that contribute to the interaction of users even if they are not in the same place, thanks to collaborative tools, it is possible to share informative data in different formats such as text, video, audio, and many more. Likewise, new information can be created through the intervention of users, and thanks to the accessibility of the Internet, it can be published at that precise moment (Peña et al., 2021).

Thanks to collaborative tools, it has been possible to encourage teamwork, as well as to provide the student with pedagogical reinforcement in different areas of study

(Mathematics, Language and Literature, Social Sciences, Natural Sciences, etc.). Its main objective is that it enables meaningful learning for the student and helps the teacher to have countless applications to work together on the different tasks assigned in the classroom (Behl et al., 2021). Likewise, collaborative tools enhance aspects such as self-learning, reasoning and, above all, collaborative learning. For this reason, students' learning will be effective, achieving an environment in which it will be easier for them to perform the tasks of the educational process (Jaramillo-Baquerizo, 2021).

Collaborative tools are an extremely necessary solution to carry out virtual classes, since they support interaction between teachers and students, contribute to the problem of distance, strengthen reasoning, self-esteem and, above all, collaborative learning (Krath, 2021).

Among the advantages of collaborative tools, the following can be highlighted:

Figure 1. Advantages of Collaborative Tools. Source: (Krath, 2021)

The disadvantages of collaborative tools can be the risk in the first experiences if users are new to this technological practice, because they may find it difficult and complex. Therefore, the teacher must be well trained to give the right explanation so that the student has a good experience of group work and above all, of working with collaborative tools. Another disadvantage is the dependence on the IT infrastructure, i.e., hardware, software and networks to work with, taking into account the accessibility of many students to the Internet (Parra-González et al., 2021).

2.3 Educaplay

Educaplay is one of these collaborative 3.0 tools, which is available to everyone as it is a free web 3.0 tool and allows users to perform playful and recreational activities to have an interaction between the teacher and the student. This program can be used in three different languages: Spanish, French and English, in this tool the activities are dynamic and above all entertaining, which helps the teaching-learning process in each of the students. The EducaPlay tool is essential for the interaction in the educational process, since it provides different activities thanks to which the student will achieve a significant learning, and above all, will learn while playing.

It is a tool that allows to work efficiently; this tool is applied at all educational levels, from kindergarten to university, with various forms of use such as evaluation tools, reinforcement activities, motivational games, a large repository of games made by other users, detection of previous knowledge, etc. Thanks to this platform, teachers save their time in planning their classes according to the group of children they are working with. Due to the large number of students, a learning community has been created by sharing knowledge through innovative activities.

2.4 Characteristics

Educaplay, being a versatile technological tool, has several features, which will be mentioned below

:

Figure 2. Characteristics of Educaplay. Source: (Garrido-Astray et al., 2019).)

The features of the Educaplay tool are basic, it is not necessary to be an expert in programming to be able to handle such a tool, and it offers many activities for the benefit of the student and the teacher (Garrido-Astray et al., 2019). Educaplay is an online platform for the creation of interactive activities, where materials are created online and remain on the platform so that they can be shared through links. It is a Web 3.0 tool that has taken a lot of strength in the creation of educational materials, and this is due to the ease of use and, above all, the availability of the material created, which automatically remains on the network to be shared with links on Pages, Blogs or Educational Platforms (Rabab-Ali, et al., 2021).

Advantages	Disadvantages
• Attractive and easy to handle activity. • Images and audio files can be inserted (for non-reading children and people with disabilities). • It is not necessary to install any software on the computer, only the Flash plugin. • It offers its content in three languages: English, French and Spanish.	• For the dictation activity, it is necessary to have a microphone and speakers. • As it is a standard program, now of using it, any small error on the keyboard will lower the result. • Once downloaded, the resource can no longer be modified. • Some activities are limited in their use.

Advantages and disadvantages of Educaplay

Finally, having the risk of a perception of the information; which happens in a face-to-face or disconnected way through audios, videos, or resources that the teacher has made in

advance, in such a way, the student will have the perception that the activities do not require more effort, and that they are not important (Farjón, Smits, & Voogt, 2019).

3. Methods and materials

The present research with the topic "Educaplay collaborative tool and the academic performance of seventh grade students" is experimental-exploratory, the modality applied in the research was carried out through a mixed approach: starting from a qualitative basis, having an interpretative approach with the subjects of study, and as a second point, with a quantitative approach through data tabulation. Once completed, the survey technique was used with its instrument, the questionnaire structured on a five-point Likert scale.

For the collection of information, a structured questionnaire was used as the research technique. This questionnaire was composed of questions related to the topic of study to find out whether seventh grade elementary school students use the collaborative tool EducaPlay to improve their academic performance. Thus, with the information collected, possible conclusions were drawn based on the results obtained.

The structured questionnaire was composed of 24 questions, 17 Likert scale questions and 2 dichotomous questions. This questionnaire allowed the researcher to obtain the required information in a useful and accurate manner based on the objectives set for this research. This survey was applied to seventh grade students with the objective of knowing the reality of the students regarding the use of collaborative tools according to their educational level and the didactic sequence of the class.

The researcher worked with the entire population of 70 students and 4 teachers of seventh grade of elementary education. For this research work, it was hypothesized that the collaborative tool Educaplay improves the academic performance of seventh grade elementary school students through virtual education.

For the development of the activities through the Educaplay tool, the S.A.P.I.E. methodology was used. This methodology is a set of research methods that can be applied to any subject, which allows the interaction between the teacher and the student in a more direct way in the different tasks presented, considering the following steps: selection, analysis, planning, interpretation and evaluation.

For hypothesis testing, the one-sample test statistic was applied; therefore, the most appropriate statistic for these samples (questions 6 and 17) was the Chi-square

.

Null Hypothesis	Test	Sig	Decision
The categories of 3.0 tool types used to learn to occur with equal probability.	One-sample chi-square test	.000	Reject the null hypothesis
The categories of tools to evaluate occur with equal probability.	One-sample chi-square test	.000	Rechazar la hipótesis nula

Table 2. Summary of hypothesis testing

H1: The collaborative tool Educaplay improves the academic performance of seventh grade students.

To corroborate the hypothesis, the Kolmogorov Smirnov (K-S) population statistic was used to determine the rejection of the null hypothesis

		Types of 3.0 tools you use to learn:	Evaluation instrument
N		25	25
Normal parameters,b	Mean	2.76	3.14
	Standard deviation	3.727	1.824
More extreme differences	Absolute	.491	.401
	Positive	.491	.401
	Negative	-.318	-.218
Z de Kolmogorov-Smirnov		2.252	1.838
Sig. Asintót. (bilateral)		.000	.002

a. The distribution of the contrast is Normal.

b. They have been calculated from the data.

Table 3. Kolmogorov-Smirnov test for one sample

Having a p (value) lower than 0.05 in the most representative questions for this research, the final decision is to reject the null hypothesis (H0) and accept the alternative hypothesis (H1), which mentions that the collaborative tool Educaplay improves the academic performance of seventh grade students.

To measure the degree of internal consistency, Cronbach's alpha reliability coefficient was applied, whose resulting value was .842, equivalent to good. This analysis attempts to determine the degree of reciprocal relationship of the items and is presented below.:

Alfa de Cronbach	N of elements
.842	17

Figure 3. Cronbach's alpha

4. Results

The results presented below were taken from the instrument used as pretest, which consists of 24 questions, 17 on a Likert scale, one dichotomous question and the remaining 6 of sociodemographic information, in turn, the most representative questions within the research were selected.

Question 6. How often do you use technological tools 3.0 for learning?

	Answers	Percentage
Never	1	1.41
Rarely	0	0.00
Occasionally	3	4.23

Often	59	83.10
Very often	8	11.27
TOTAL	**70**	**100.0**

Table 4. Frequency of use of Web 3.0 tools by students

Figure 4. Frequency of use of Web 3.0 tools by students.

In this question 59 students indicate that they frequently use 3.0 technological tools to learn. In addition, 32.0%, equivalent to 8 students, state that they use technological tools to learn very often. In addition, 12.0%, equivalent to 3 students, state that they occasionally use technology to learn. Finally, 4.0%, equivalent to one student, indicated that they never use technological tools for learning. It should be noted that these data are taken at a time of virtual education due to COVID-19.

Question 17. Do you think that teachers should generate their own resources based on Web 3.0 tools for the development of collaborative work?

Alternatives	Answers	Percentage
Totally agree	9	12.86
Agree	61	87.14
Neutral	0	0.0
Disagree	0	0.0
Strongly Disagree	0	0.0
TOTAL	**70**	**100.0**

Cuadro 1. Own resources based on web 3.0 tools

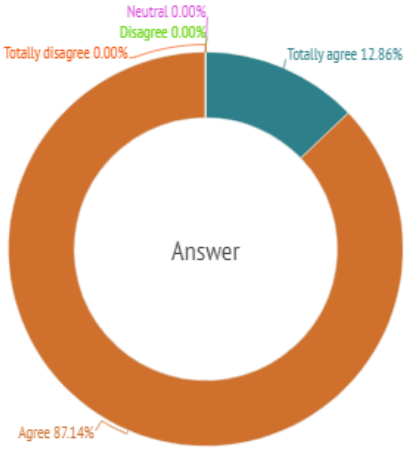

Figure 5. Proprietary resources based on Web 3.0 tools

Of a total of 70 students surveyed equivalent to 100% of the sample, 64.0% equivalent to 61 students agree that teachers generate their own resources based on web 3.0 tools for the development of collaborative work, while the remaining 36.0% equivalent to 9 students indicate that they totally agree that teachers generate their own resources based on web 3.0 tools for the development of collaborative work. Therefore, the majority of students say they agree with teachers generating their own resources based on web 3.0 tools for the development of collaborative work among all students in charge. It was observed that students performed better when they were presented with group work in tools such as Crosswords and Quiz from the Educcaplay tool.

4.1 Application of the TAM model

Question 1. The use of web 3.0 tools allows me to do my work faster.

Alternatives	Answers	Percentage
Strongly Disagree	0	0.0
Disagree	0	0.0
Neutral	0	0.0
Agree	8	32.0
Strongly Agree	62	68.0
TOTAL	**70**	**100.0**

Table 6. Use of web 3.0 tools to carry out the work.

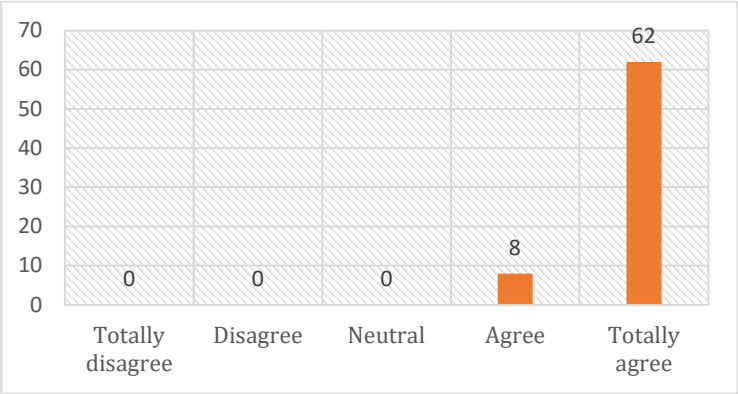

Figure 6. Use of web 3.0 tools for the realization of works.

In this question 68.0% equivalent to 62 students indicate that they totally agree with the use of web 3.0 tools to do their work much faster, and 32.0% equivalent to 8 students state that they agree that the use of web 3.0 tools allows them to do their work faster. Most of the students totally agree that web 3.0 tools allow them to do their work faster since it is easier to search for information and do the work according to the student's needs.

Question 5. In general, I find the Educaplay tool useful in my work in virtual classrooms.

Alternatives	Questions	Percentages
Totalmente en desacuerdo	0	0.0
En desacuerdo	0	0.0
Neutral	0	0.0
De acuerdo	5	40.0
Totalmente de acuerdo	65	60.0
TOTAL	**70**	**100.0**

Table 7. Educaplay is useful for classroom work

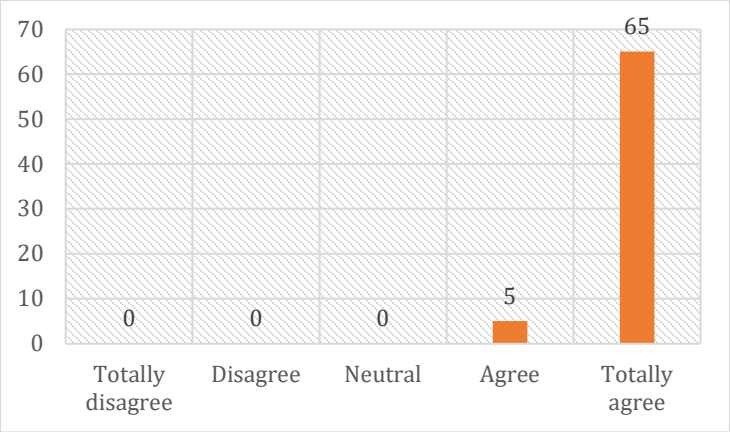

Figure 7. Educaplay is useful to work in classrooms

Out of a total of 70 students surveyed, equivalent to 100% of the population, 60.0% equivalent to 65 students affirm that they totally agree that the Educaplay tool is useful in virtual classes. On the other hand, 40.0% equivalent to 5 students indicate that they agree with the statement. This means that many students totally agree that the Educaplay tool is useful in the work of virtual classes, the reason is that it is basic to use, and there is no need to download an app.

5. Conclusions

The collaborative tool Educaplay is a virtual platform, which due to its versatility and ease of use, has become ideal to develop the teaching and learning process of the different subjects of the seventh grade of primary education, contributing to dynamize and innovate knowledge, This has helped to dynamize and innovate knowledge, taking students and teachers out of the monotony by learning new techniques and developing the activities found on the platform, such as crossword puzzles, word searches, riddles, completing or ordering words, among others, in order to improve the academic performance of students, which will be reflected in their grades.

Collaborative tools are an essential contribution to education, since it is being taught from home (virtual classes). The most complete tools used for virtual education are Kahoot, which allows teachers to create quizzes to evaluate in the form of contests to reinforce students' knowledge; another important tool is Mindomo, which allows the elaboration of mind maps as well as monitoring; Quizziz is a tool that allows teachers to evaluate knowledge through multiple choice questions; and finally the collaborative tool Educaplay, which facilitates the creation of multimedia activities framed in the educational environment, the same that will allow meaningful learning to the student.

Collaborative resources based on Educaplay develop teamwork in students, promote an adequate leadership in virtual education, as well as the improvement of academic performance, since today's students rely on dynamic, creative and intuitive tools.

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