



Original article

Implementation of Genially as a strategy in the teaching-learning process of Natural Sciences

Implementación de Genially como estrategia en el proceso de enseñanza-aprendizaje de Ciencias Naturales

Implementação do Genially como estratégia no processo de ensino-aprendizagem de Ciências Naturais

Hendy Maier Pérez Barrera¹



<https://orcid.org/0000-0003-1989-2136>

¹Bolivarian University of Ecuador. Ecuador.



hmperezb@ube.edu.ec

Received: January 4, 2024

Accepted: July 10, 2024

ABSTRACT

Digital tools are widely used in the educational field and make the student have a much more active role in education, as long as they are used creatively, due to the wide variety of ways in which technology can be introduced in the classroom. In this regard, the objective of this

research was to propose a strategy for the implementation of the digital tool Genially in the teaching-learning process of Natural Sciences in Basic General Education of the Educational Unit "March 22", in the canton of San Lorenzo, province of Esmeraldas, Ecuador. A methodology with a mixed, descriptive approach was used. A field diagnosis was carried out at the educational center, together with a bibliographic research, in order to know the main problems that the students present. As a study instrument, a survey was applied to nine teachers and fifteen students from the aforementioned educational unit. The results show that, according to the perception of the teachers and students surveyed, in the case of the former they do not have high digital skills, specifically in the skills, knowledge and experiences in using the interactive tool Genially. To this end, a strategy was created for the use of the aforementioned tool, which includes a training and education plan, based on the interpretation of the findings of the empirical study, for Natural Sciences teachers. It is concluded that the use of Genially in the teaching-learning process of Natural Sciences offers an innovative and dynamic approach that promotes the active participation of students. The proposed strategy highlights Genially's versatility to create engaging and personalized educational resources.

Keywords: learning; natural sciences; educational strategy; teaching; Genially.

RESUMEN

Las herramientas digitales son ampliamente utilizadas en el ámbito educativo y hacen que el estudiante tenga un papel mucho más activo en la educación, siempre que se utilicen de manera creativa, debido a la gran variedad de maneras en que se puede introducir tecnología en el aula. Al respecto, la presente investigación tuvo como objetivo proponer una estrategia para la implementación de la herramienta digital Genially en el proceso de enseñanza-aprendizaje de Ciencias Naturales en Educación General Básica de la Unidad Educativa "22 de marzo", en

el cantón San Lorenzo, provincia de Esmeraldas, Ecuador. Se utilizó una metodología con enfoque mixto, de tipo descriptiva. Se efectuó un diagnóstico de campo al centro educativo, junto a una investigación bibliográfica, a fin de conocer los principales problemas que presentan los estudiantes. Como instrumento de estudio se aplicó una encuesta a nueve docentes y quince estudiantes de la referida unidad educativa. Los resultados evidencian que, según la percepción de los docentes y estudiantes encuestados, para el caso de los primeros no poseen altas competencias digitales, específicamente en las habilidades, conocimientos y experiencias en el uso de la herramienta interactiva Genially. Para ello se creó una estrategia para el uso de la herramienta mencionada, que incluye un plan de capacitación y formación, basándose en la interpretación de los hallazgos del estudio empírico, para los docentes de Ciencias Naturales. Se concluye que el uso de Genially en el proceso de enseñanza-aprendizaje de Ciencias Naturales ofrece un enfoque innovador y dinámico que promueve la participación activa de los estudiantes. La estrategia propuesta destaca la versatilidad de Genially para crear recursos educativos atractivos y personalizados.

Palabras clave: aprendizaje; ciencias naturales; estrategia educativa; enseñanza; Genially.

RESUMO

As ferramentas digitais são amplamente utilizadas na área educacional e fazem com que o aluno tenha um papel muito mais ativo na educação, desde que utilizadas de forma criativa, devido à grande variedade de formas como a tecnologia pode ser introduzida em sala de aula. Nesse sentido, o objetivo desta pesquisa foi propor uma estratégia para a implementação da ferramenta digital Genially no processo de ensino-aprendizagem de Ciências Naturais na Educação Básica Geral da Unidade Educacional "22 de Março", no cantão de San Lorenzo, província de Esmeraldas, Equador. Foi utilizada uma metodologia com abordagem mista e

descritiva. Foi realizado um diagnóstico de campo no centro educacional, juntamente com uma pesquisa bibliográfica, a fim de conhecer os principais problemas que os alunos apresentam. Como instrumento de estudo, foi aplicado um questionário a nove professores e quinze alunos da referida unidade educacional. Os resultados mostram que, segundo a percepção dos professores e alunos inquiridos, no caso dos primeiros não possuem competências digitais elevadas, nomeadamente nas competências, conhecimentos e experiências na utilização da ferramenta interactiva Genially. Para tal, foi criada uma estratégia de utilização da referida ferramenta, que inclui um plano de formação e educação, baseado na interpretação dos resultados do estudo empírico, para professores de Ciências Naturais. Conclui-se que a utilização do Genially no processo de ensino-aprendizagem de Ciências Naturais oferece uma abordagem inovadora e dinâmica que promove a participação ativa dos alunos. A estratégia proposta destaca a versatilidade da Genially para criar recursos educacionais envolventes e personalizados.

Palavras-chave: aprendizagem; ciências naturais; estratégia educacional; ensino; Genially.

INTRODUCTION

Currently, the use of digital tools in the educational field has experienced a significant expansion. The total confinement of 2020, in response to the COVID-19 pandemic, accelerated the adoption of Information and Communications Technologies (ICT) in classrooms, transforming face-to-face dynamics into virtual educational experiences. This sudden change represented a considerable challenge for educational institutions and an extraordinary commitment for teachers, who, in response, strived to digitize study materials and create dynamic and collaborative educational content. Beyond the obstacles, this transition highlights

the vital importance of digital tools in education, underscoring their ability to provide flexibility, access to diverse resources and the creation of learning environments that adapt to the changing needs of students in the digital age.

This challenge generated great social importance, being fundamental for the development and progress of society as a whole, by providing people with the skills and knowledge necessary to make informed decisions, improve their quality of life and actively contribute to social development. Social interaction in educational settings helps develop essential social skills, such as empathy, collaboration and effective communication, to transform lives, drive progress and build more equitable, informed and cohesive societies (Acosta, Hernández, & Onofre, 2020, page 431).

In Ecuador, the educational system is made up of various levels, ranging from initial education to Higher Education. These levels are governed by the Constitution of the Republic of Ecuador and the Organic Law of Intercultural Education (LOEI) of March 31, 2011, along with its subsequent modifications. As established in article 343 of the Constitutional Standard of the LOEI, the national education system has as its primary objective the development of the individual and collective capabilities of the population, promoting learning, as well as the generation and application of knowledge, techniques, knowledge, arts and culture. This system focuses on the subject who learns and operates in a flexible, dynamic, inclusive, effective and efficient way.

It should be noted that the current educational system aims to ensure the permanent improvement of quality and the expansion of coverage to the entire population, so the objective of strengthening public education and co-education involves increasing the intensity of the use of technology considering the benefits that technological alternatives could provide to ensure that students learn more, better and differently.

When introducing technology in educational units or centers in general, especially in the Ecuadorian context, different approaches are used. However, it highlights the importance of doing it creatively from the teacher's perspective. In most cases, technology is introduced as a substitute for any other action or any other resource that was previously available. The most important thing, above all, is that students feel the use of technology as a means to achieve the development of their creativity and acquisition of knowledge, as an active role in education.

Within this problem, Tomalá *et al.* (2020, p. 201) determine that educational platforms are online systems or software designed to support and facilitate the teaching-learning process. These offer a variety of tools and resources that help educators and students in managing, delivering and participating in educational content.

In the context of Natural Sciences, these platforms play an important role and serve several purposes, such as access to educational resources where books, digital texts, videos, simulations and multimedia material are available that enrich the content available to students and It allows teachers to diversify their teaching methods (Chaparro, *et al.*, 2022).

However, they establish that educators use these platforms to organize their teaching materials, such as: lessons, presentations and activities, facilitating the presentation of Natural Sciences content, in a structured and accessible way for students.

Educational platforms include communication and collaboration tools, such as forums, chats, and messaging systems, which allow students and teachers to interact online, allowing them to discuss topics, ask questions, and collaborate on science-related projects. Additionally, they allow the creation and administration of questionnaires, applications and evaluation activities, through the development of student progress records, which facilitates the identification of areas in which they may need

additional support (Rivas & Alcívar, 2023, page 12).

According to studies carried out by Logroño *et al.* (2023, p. 228), it is determined that some educational platforms offer the possibility of personalizing student learning, which means that the contents and activities can be adapted to the individual needs of each of them, providing a learning experience more personalized, allowing students to access Natural Sciences content from anywhere with an internet connection, which is especially useful in distance or hybrid learning situations.

There are several platforms for creating interactive content; Among the main ones are the following:

Canva: allows you to create graphics, presentations and other visual content interactively. Offers a wide variety of templates and design tools.

Prezi: is known for its focus on non-linear presentations. It allows you to develop dynamic and visual creations, ideal for telling stories in an attractive way.

Adobe Captivate: is popular for creating interactive eLearning content, established through the development of courses, simulations and learning scenarios.

Articulate Storyline: is another eLearning authoring platform that offers a wide range of interactivity and user progress tracking options.

H5P: is an open source option that allows you to create interactive content, such as: questionnaires, presentations and rich videos (Simonelli, 2019).

Based on research carried out by Mejía *et al.* (2020, p. 3) it is determined that Genially stands out as a platform that has a great capacity to create presentations, infographics and interactive content in a visual and attractive way, allowing the addition of elements such as

animations, videos, links and questionnaires, which makes it a versatile tool for creating interactive and dynamic content in various fields, including education, marketing and communication.

It has been verified that Genially has received recognition in various events and awards related to technology and education. Its focus on visual innovation and creativity has contributed to its popularity among teachers and students. The creation of attractive and interactive presentations has acquired significant relevance in contemporary education. This is evidenced by the active participation of experts in internationally renowned conferences, such as the International Educational Technology Conference (ITEC) and the World Congress on Interactive Education (CMEI), where research and best practices are shared to enrich the process. teaching-learning through more dynamic and effective presentations. By mentioning specific and notable conferences in the field of educational technology, the scientific and academic basis of the statement about the importance of interactive presentations in education is reinforced (National Institute of Teacher Training, 2020, p. 5).

The use of technological tools in teaching processes has changed pedagogical practice. Despite this, these tools began to be successful at lower levels of education before the pandemic, but over time they have increased in effectiveness at higher levels. In this context, the process of updating teachers is important, and a space must be created where students and teachers meet in significant exchanges of knowledge. In this sense, Genially is a web tool that facilitates the creation of audiovisual materials that promote various content created for students and teachers. In addition to helping complete this function, this tool includes a variety of components, including presentations, infographics, videos, CVs, and questionnaires. According to the author himself, Genially "is one of the best options with which secondary and university educational institutions have been able to face the stoppage of face-to-face classes" (p. 1). In 2020, in the midst of a crisis that forced

the suspension of school cycles due to COVID-19, this virtual resource allowed communication between teachers and students to be maintained, and has since been established in classrooms in favor of the teaching-learning process.

In a study carried out by Sunkel, Trucco and Espejo (2023, p. 9) the effectiveness of the integration of digital tools in the teaching-learning process in a primary educational institution in Latin America was explored. This revealed that the integration of digital tools, such as Genially, had a positive impact on the teaching-learning process. Teachers reported a higher level of student participation and engagement when using interactive visual resources. Additionally, an improvement in understanding of concepts and an increase in creativity in student presentations was observed.

The research is framed in the specific context of the "March 22" Educational Unit, located in the canton of San Lorenzo, province of Esmeraldas-Ecuador. With fiscal support, Hispanic jurisdiction, its modality is face-to-face and has initial education, preparatory education, General Basic Education, Middle Basic Education, Higher Basic and Technical Baccalaureate (BT) in Electricity and Accounting, at each of the levels. From a transversal axis in the Educational Unit, the integration of educational technologies is encouraged as part of the curriculum of each subject. This study is part of the teaching-learning process of Natural Sciences of General Basic Education. This process of integration of Educational Technologies (ET), particularly in the teaching-learning process of Natural Sciences, in General Basic Education, has emerged as a transformative element that redefines the educational experience. Therefore, Tomalá *et al.* (2020) indicate that, in the current digital era, the incorporation of technological tools has new perspectives and possibilities to enrich pedagogy and enhance meaningful learning (p. 202). This innovative approach not only amplifies the accessibility of scientific information, but also stimulates the active participation of students,

promoting the development of critical skills, analytical thinking and problem solving.

Within the "March 22" Educational Unit, it is observed that, despite the institution's efforts to make educational technologies part of daily activities, there is difficulty in the use of digital tool applications in the teaching process. learning of Natural Sciences. Teachers show resistance or lack of knowledge to fully take advantage of the opportunities and advantages that these technologies offer in the academic field. This gap between the potential of educational technologies and their actual application in Natural Sciences classrooms poses a critical challenge that needs to be addressed to guarantee a more competent education aligned with contemporary demands.

It is important to consider the limitations regarding the granting of technological resources by the state, to provide sufficient and updated technological infrastructure to the institution, where teachers have a good predisposition and commitment to contribute to the development of the educational community. It has a computer center with computer equipment and an internet network provided by a private company, since the equipment is outdated and in many cases obsolete. When there is some damage to the equipment or devices, there are no resources to replace them, so it is necessary to do self-management among teachers of the institution or often request collaboration from parents and students, with the disadvantage that the vast majority of parents families and students have limited economic resources.

Therefore, the following research problem is posed: how does the use of the technological tool Genially favor the teaching-learning process of the subject of Natural Sciences in the eighth year of Basic General Education of the Educational Unit "March 22 " in the canton of San Lorenzo, Province of Esmeraldas?

According to what was stated, the objective of this study is to propose a strategy for the implementation of the digital tool Genially in the

teaching-learning process for Basic General Education teachers of the "22 de Marzo" Educational Unit, in the canton of San Lorenzo, Province of Esmeraldas.

MATERIALS AND METHODS

The research was classified as descriptive, with a mixed approach, in the field of quantitative research. Surveys were carried out anonymously in order to evaluate the teaching-learning process of Natural Sciences and the implementation of the Genially tool in this process. These instruments generated data of a quantitative nature that were susceptible to statistical analysis to identify possible correlations or patterns between both categories of analysis. In the qualitative field, in-depth interviews were carried out with teachers and experts in the area of Natural Sciences, with the aim of obtaining a more complete understanding of the experiences, perceptions and challenges linked to the teaching-learning process of Natural Sciences. These interviews provided valuable qualitative information about the strategies for implementing the Genially digital tool in the teaching-learning process of Natural Sciences in Education.

The research was carried out with a comprehensive research approach, which encompassed field research, specifically empirical studies, where data was collected directly from the environment in which the phenomenon under study takes place. In this context, empirical research was carried out through surveys aimed at students, providing relevant information to the teaching-learning process of Natural Sciences. Qualitative data collection was carried out through the survey. Additionally, an exhaustive bibliographic review on the topic was carried out, providing a deep understanding of the current state of the teaching-learning process of Natural Sciences, with an explanatory or causal investigation, identifying causal relationships between categories of analysis and focusing on the

implementation of the Genially tool in the teaching-learning process of Natural Sciences.

In the initial diagnosis carried out on the study of the teaching-learning process of Natural Sciences, in surveys applied in the Educational Unit "March 22" in the canton of San Lorenzo, province of Esmeraldas, Ecuador, it was possible to obtain the required information through those involved.

The study population was made up of nine (9) teachers and fifteen (15) students. These were in accordance with the ethical standards of the editorial board of the institution that supervises the research. To collect the information, a questionnaire structured in sixty-four (64) items with response alternatives was applied: always, very frequently, frequently, rarely and never.

Research methods were used as an important tool to seek and improve knowledge about reality. Each one approached the topic of study in a unique way. A systematization of the bibliographic references on the implementation of Genially in the teaching-learning process of Natural Sciences was carried out, which allowed the most used methods to be characterized and grouped according to their research purpose, which is novel and important for the research methodology.

Theoretical, empirical and mathematical-statistical methods were applied in the research. Theoretical methods, such as analysis, inductive and deductive synthesis, develop theories and models in their respective disciplines, allowing the construction of coherent and well-founded explanations about the implementation of Genially in the teaching-learning process of Natural Sciences, and then synthesizing these elements in a complete theoretical structure. The empirical methods were applied through surveys of teachers, providing a valuable insight into their perspectives, behaviors and experiences regarding the implementation of Genially in this process, which can be fundamental to improve education and pedagogical practice through strategies that enrich This process. Finally,

mathematical and statistical methods were used to analyze the results, through the preparation of statistical tables, determination of the population and sample, and bar and pie charts, based on the data collected on the implementation of Genially in the process. teaching-learning of Natural Sciences.

RESULTS

For the analysis of the data obtained by applying the instrument, histograms were created that graph and indicate the frequency of an event through a distribution of the data (Figure 1).

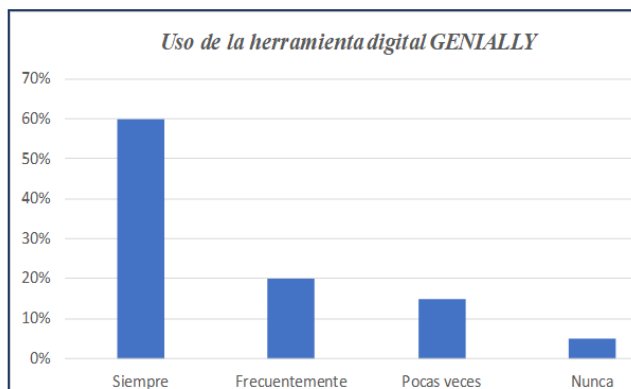


Fig. 1- Knowledge about the Genially digital tool
Note: The graph shows a histogram that reflects the percentages of knowledge that teachers have about the digital tool Genially
Source: Own elaboration

The results of the survey administered to teachers reveal the diversity of opinions regarding knowledge of the Genially tool. Based on the indicators in the graph, more than 60% of respondents say they always use the Genially tool, indicating a high level of familiarity with this platform. Approximately 15% of teachers indicate that they frequently use the tool, while about 10% use it only rarely. Finally, a small fraction, less than 5%, mention that they have never used the Genially tool. These results manifest the diversity of experiences among

teachers, underlining the need to explore how ICT, and in particular Genially, can play a crucial role in improving educational processes. In this context, it is essential to design a strategy that encourages the use of Genially in the educational environment, thus ensuring a more homogeneous and beneficial integration of digital technologies in the teaching-learning process of Natural Sciences (Figure 2).

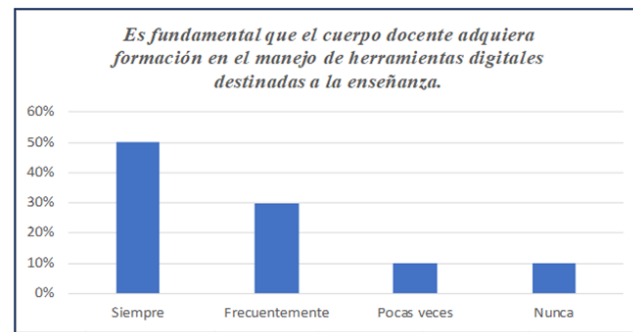


Fig. 2- Teacher training needs
Note: the graph shows a histogram that reflects the percentages of teachers' training needs on the digital tool intended for teaching Natural Sciences
Source: Own elaboration

In this scenario, the teachers surveyed express total agreement with the need to train, because the training processes require a high level of autonomous learning (figure 2). Teacher training during the COVID-19 pandemic, according to research by Díaz and Loyola (2021, pág. 122), involved holistic processes with a considerable workload, addressing aspects such as the use of digital tools, content creation and new pedagogical forms. Despite this disagreement, a significant percentage is observed that does not consider training necessary. However, the subsequent questions delve into an analysis to understand the reality of teachers and their immersion in the technological field, with the aim of determining their specific requirements for the use of digital tools in teaching Natural Sciences (Figure 3).

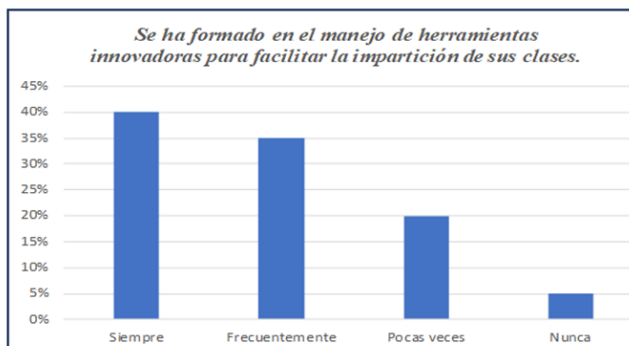


Fig. 3- Training for teachers in the use of innovative tools

Note: the graph shows a histogram that reflects the percentages of training needs for teachers in the use of innovative tools
Source: Own elaboration

It is observed that 40% of the teachers surveyed indicate having received limited training processes (figure 3). This perception could be a result of the approach adopted by the Ministry of Education in 2020, which included the provision of bibliographic resources on tools and strategies for virtual learning. However, the responsibility for training fell on the teachers, who had to autonomously assume the process of adaptation to the new educational demands (Figure 4).

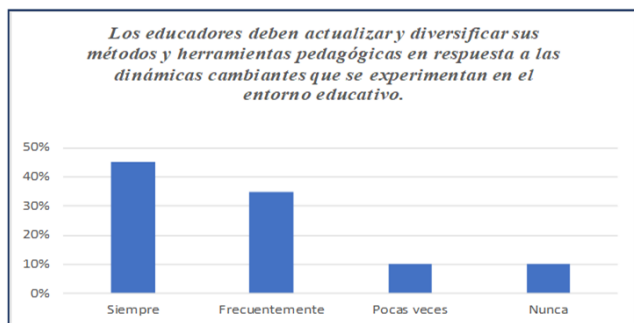


Fig. 4- Innovation of teaching methods and tools

Note: the graph shows a histogram that reflects the percentages of teachers' use of innovative methods in teaching Natural Sciences
Source: Own elaboration

Innovation in teaching methods and tools is essential in the current educational context. The graph presents a histogram that reflects the

percentages of use of innovative methods in teaching Natural Sciences by teachers. According to the data, 45% of teachers agree with the need to innovate in their teaching methods and tools (figure 4). This high percentage of agreement underlines the importance of innovation as an imperative process, given that society experiences continuous changes and technology and innovation are constantly linked to educational processes. In this context, innovation not only refers to the incorporation of new technological tools, but also to the adoption of pedagogical strategies that promote active and meaningful learning.

The continuous training of teachers in the use of digital tools and the implementation of new methodologies is crucial to maintaining a dynamic and relevant educational environment. The willingness of 45% of teachers to adopt these innovations reflects a positive trend towards the modernization of education. However, it is important to recognize and address barriers that may exist, such as lack of resources, resistance to change, or the need for additional training. In this sense, educational institutions must provide the necessary support so that all teachers can fully participate in this innovation process (Figure 5).

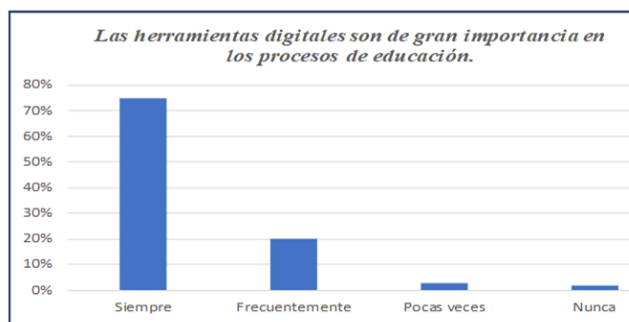


Fig. 5- Importance of digital tools in education

Note: The graph offers a histogram that reflects the percentages of the importance of the implementation of digital tools in education processes specifically in Natural Sciences
Source: Own elaboration

The previous perspectives are reiterated, with 75% of the population favoring the use of technological tools, while 20% maintain a position of total rejection towards the integration of technology in the educational process (figure 5). In this context, it is essential to enhance the technological and digital skills of teachers, focusing on training educators within the contemporary educational environment. On the other hand, it is crucial to inquire deeply into the real use of digital tools by teachers, since the recognition of their importance in the educational field does not necessarily guarantee their effective implementation.

After the presentation of the contents addressed in the Natural Sciences subject, through the use of digital resources developed with the Genially tool, the students' perception was analyzed in relation to the integration of this digital platform and its influence on motivation. for the knowledge. In a later stage, the evaluation of the knowledge acquired during the classes in which the Genially tool was implemented was carried out, thus seeking to verify the impact of these technologies on the learning process of basic education students in the Educational Unit. March 22" (Table 1).

Table 1- Genially and its impact on motivation for student learning

Statement	Frequency				Total	Percentage				Total
	Totally disagree	Somewhat disagree	OK	Totally agree		Totally disagree	Somewhat disagree	OK	Totally agree	
Does the class become more motivating when the teacher uses technological tools?	0	0	1	14	15	0 %	0 %	5 %	95 %	100 %
Did the use of resources created in Genially during class manage to encourage your interest and motivation in learning?	0	1	2	12	15	0 %	5 %	10 %	85 %	100 %
In your opinion, do you consider that a motivated student learns more effectively?	0	1	2	12	15	0 %	5 %	10 %	85 %	100 %

Note: The table shows the impact of Genially on student learning motivation
Source: Own elaboration

The first block of questions focused on analyzing the students' motivation based on their experience with the Genially platform applied in class. As detailed in table 1, the affirmative responses are significant, since the majority maintains that the use of technological tools is motivating, while a minority supports this statement with less emphasis; Furthermore, no negative evaluations were recorded. In relation to the interest and motivation generated by the use of Genially as a tool for the creation of pedagogical resources, the majority completely agree, followed by a small group that expresses agreement and, again, no negative evaluations are observed. Finally, by linking motivation to the learning process, positive responses increase, with the majority stating they strongly agree and a minority agreeing.

From the above, it can be deduced that, for students, the implementation of technological tools such as Genially by the teacher in teaching content generates palpable motivation, which has a positive impact on their learning process. In this context, Franco (2021, pág. 153) maintains that motivation plays a fundamental role in learning; Therefore, it is the responsibility of teachers to design pedagogical strategies whose tools contribute to the stimulation and motivation of students (Table 2).

Table 2- Approaches and evaluations of the contents in Genially

Statement	Frequency				Total	Percentage				Total
	Totally disagree	Somewhat disagree	OK	Totally agree		Totally disagree	Somewhat disagree	OK	Totally agree	
The clarity of the content is significantly enhanced when it is explained using technological tools such as Genially.	0	0	1	14	15	0 %	0 %	5 %	95 %	100 %
It is suggested that you take advantage of technological tools such as Genially to enrich the educational experience in classes.	1	0	2	12	15	3 %	0 %	12 %	85 %	100 %

Note: The table shows the approach and ratings of the content implemented in Genially
Source: Own elaboration

<https://mendive.upr.edu.cu/index.php/MendiveUPR/article/view/3722>

Regarding the students' perception of the content created with Genially, it is observed that 95% completely agree and 5% agree that this tool facilitates a clearer understanding of the content. However, 12% are also identified as agreeing with the statement and 3% disagreeing (Table 2). This contrast suggests that the development of pedagogical strategies that involve the use of Information and Communications Technologies (ICT) must be adapted to the individual needs of students, since not all are familiar or have an affinity with these tools. Consequently, the importance of teachers designing pedagogical strategies that incorporate various tools to promote the motivation and learning of all students is highlighted (Table 3).

Table 3- The impact of Genially on academic performance

Statement	Frequency				Percentage					
	Totally disagree	Somewhat disagree	OK	Totally agree	Total	Totally disagree	Somewhat disagree	OK	Totally agree	Total
¿Ha experimentado una mejora en su rendimiento académico mediante el uso de recursos elaborados en Genially?	0	0	1	14	15	0 %	0 %	5 %	95 %	100 %
Se recomienda la incorporación de herramientas tecnológicas como Genially en el entorno educativo.	0	0	1	14	15	0 %	0 %	5 %	95 %	100 %

Note: The table shows the impact of Genially on student academic performance
Source: Own elaboration

Finally, the impact of the Genially tool on academic performance was evaluated, and 95% of students expressed their complete agreement that the use of this platform improved their academic performance, while 5% agree with this statement (Table 3). There were no negative responses in this section, suggesting that this type of platform is linked not only to motivation, but also to student performance. In fact, Castro and Ochoa's research (2021, pág. 252) supports this observation by demonstrating that using Genially improves academic performance, mastery, and understanding of concepts, as well as increasing motivation.

The use of virtual strategies favors academic performance and, therefore, learning, concluding that Information and Communications Technologies (ICT) directly benefit the motivation of students. In this sense, 95% (totally agree) and 5% (agree) of the students participating in this study recommend the use of technological tools such as Genially for teaching content in class, highlighting the multiple benefits it offers, especially the reduction of stress or pressure, increased motivation and greater understanding of the content. With the purpose of verifying the students' statements about motivation and its relationship with learning based on the presentation of the topics of the Natural Sciences chair, demonstrative classes on vertebrate animals were selected, where pedagogical resources created were implemented with Genially. The students were evaluated using a rating scale that allowed the teacher to determine the degree of understanding of the concepts. The results of this evaluation are presented in the tables below, along with the corresponding assessments (Table 4).

Table 4- Evaluations of Basic Education students

Scale	Frequency	Percentage
Master the required learning	4.00-5.00	8 53 %
Achieve the required learning	3.00-3.99	4 27 %
Is close to achieving the required learning	1.00-2.99	3 20 %
Does not reach the required learning	≤ 1	0 0 %
Total		15 100 %

Note: the table shows the frequency and percentage of Basic Education student evaluations
Source: Own elaboration

Basic education students participated in a class focused on the topic of vertebrate animals, which was explained with the help of a pedagogical resource generated through Genially. This resource consisted of a set of slides presenting

<https://mendive.upr.edu.cu/index.php/MendiveUPR/article/view/3722>

<https://mendive.upr.edu.cu/index.php/MendiveUPR/article/view/3722>

key concepts and a game designed as a way to assess learning of the corresponding module. An evident positive impact is observed, since 53% of the students (with grades between 4.00 and 5.00) managed to master the learning, while 27% (with grades between 3.00 and 3.99) achieved the required learning (Table 4). This indicates that the implementation of Genially as a pedagogical resource was effective.

Regarding the 20% of students (with grades between 1.00 and 2.99) who are in the process of approaching the required learning, this situation can be attributed, as explained in table 4, to the fact that there are groups of students who are not familiar or they have some resistance to technology. This resistance may be due to several factors, such as lack of access, limited resources, among other variables. It is important to highlight that the "March 22" Educational Unit, where the research was carried out, is located in a rural context. In addition to the above, it is imperative that teachers carry out diagnoses regarding students' positions regarding the use of technology. This allowed for the creation of pedagogical strategies that consider the individual perspectives and needs of all students. In this way, the teacher can contextualize the teaching-learning process according to the characteristics of his or her students, thus promoting motivation and meaningful learning. It is essential to remember that each student has unique learning modalities that must be addressed by the teacher.

Correspondingly, the strategy that focused on this study was to promote the use of the digital tool Genially in the teaching-learning process of Natural Sciences in Basic General Education. To achieve this, three specific strategic actions were developed:

1. Development and design of interactive content in Genially, as shown in figure 6
 - Contextualization-Vital territory-Generate interest:
 - Genially presentations that highlight the relevance of Natural Science concepts

- and relate them to everyday life.
 - Include multimedia elements, such as images and videos, to capture students' attention.
 - Organization of content-Facilitate understanding:
 - Structure content clearly and sequentially using tabs, links, and visual effects in Genially.
 - Use infographics and interactive concept maps to show relationships between concepts.
 - Create interactive activities-Encourage active student participation-there is no learning without emotion:
 - Integrate interactive quizzes into Genially to assess understanding.
 - Use educational games or simulations that allow students to explore scientific concepts in a practical way.
 - Generate new ideas-Additional resources-Expand learning:
 - Link to relevant external resources, such as articles, educational videos, or trusted websites.
 - Create multimedia galleries within Genially to expand understanding of the topics covered.
2. Self-assessment and collaborative projects with students of Natural Sciences in Basic General Education of the "22 de Marzo" Educational Unit in the canton of San Lorenzo, Province of Esmeraldas, Ecuador
 - Promote teamwork and generate empathy:
 - Design interactive sections where students can collaborate on projects,

<https://mendive.upr.edu.cu/index.php/MendiveUPR/article/view/3722>

<https://mendive.upr.edu.cu/index.php/MendiveUPR/article/view/3722>

- share their findings and build knowledge together.
 - Use feedback tools to facilitate peer feedback.
 - Self-assessment and monitoring/Facilitate self-regulation and feedback:
 - Include self-assessment tools and instant feedback.
 - Establish checkpoints where students can review their progress and make adjustments if necessary.
 - Forums and discussions-Stimulate the exchange of ideas:
 - Integrate discussion forums into Genially so students can ask questions, share observations, and participate in debates.
 - Highlight the importance of critical thinking and respect for the opinions of others.
 - Formative Assessment-Monitor ongoing progress:
 - Use Genially to implement regular formative assessments that provide immediate insights and constructive feedback.
 - Take advantage of interactive options to adapt assessments to students' learning styles.
 - Reinforce key concepts-Synthesis and Review:
 - Create interactive and visual summaries to help students review and consolidate what they have learned.
 - Incorporate gamification elements to make the review more attractive.
3. Teacher training of Natural Sciences in Basic General Education of the "22 de Marzo" Educational Unit in the canton of

San Lorenzo, province of Esmeraldas, Ecuador

- Offer training to Natural Sciences teachers in Basic General Education of the "March 22" Educational Unit, specific for the effective use of Genially.
- Provide resources and tutorials adapted to the teaching of Natural Sciences.
- Encourage familiarization and acquisition of skills in creating interactive content.

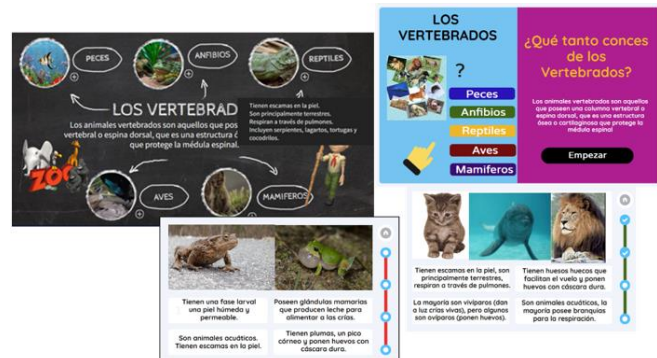


Fig. 6- Design of interactive Natural Sciences content in Genially
 Note: The figure shows the design of interactive content for Natural Sciences in Genially
 Source: Own elaboration

DISCUSSION

Taking into account the results obtained, it is important to highlight the fact that the research in the first phase was dedicated to diagnosis, with the purpose of analyzing the use of didactic tools by teachers in the Educational Unit "March 22", during the period 2023-2024. It was evident that the lack of contextualized training processes limits teachers in the use of these tools. In this context, Andrade *et al.* (2022, pág. 115) suggest that teaching staff have been forced to integrate technologies during the COVID-19 pandemic, without considering the limitations of students and teachers regarding technology.

<https://mendive.upr.edu.cu/index.php/MendiveUPR/article/view/3722>

Teachers are willing to innovate in their teaching methods, not only due to a need that arose during the pandemic, but also due to the constant evolution of society, which links technology and innovation to educational processes. Garzón *et al.* (2022, pág. 3) They affirm that Ecuadorian teachers require curricular adaptations, use of digital tools and new pedagogical methodologies to achieve meaningful learning. It is crucial that teachers improve their technological and digital skills to effectively integrate ICT into their pedagogical strategies. Despite teachers' willingness to adopt new tools, this process represents a challenge for the institution, since it requires socialization activities and a well-organized teacher training plan.

The implementation of the strategy focuses on the creation and application of each of the strategic actions conceived in its design. In particular, the specific topic of Natural Sciences is addressed: vertebrate animals. To this end, digital resources have been created that select key concepts, using multimedia to illustrate the topic. In addition, gamification elements are incorporated to mitigate stress in the learning and evaluation process. It is important to carry out continuous evaluations to monitor the academic performance of students in Natural Sciences, carrying out qualitative evaluations focused on motivation. According to the analysis of the results, the majority of students expressed that the activities with Genially helped them reduce stress, encouraging experimentation and acceptance of error as part of the learning process.

The Genially platform stands out for its ability to create presentations, infographics and interactive content in a visual and attractive way, making it a versatile tool for creating interactive and dynamic content in the teaching-learning context. The research shows a good predisposition of teachers and students towards ICT. However, there is still a percentage of students with a low level of learning, which suggests that more efforts are needed for the effective implementation of Genially as a pedagogical resource.

The current strategy encourages the use of the Genially digital tool in the teaching-learning process of Natural Sciences in Basic General Education. This includes the development of each strategic action, the design of interactive content in Genially, self-assessment and collaborative projects with students, as well as the training of Natural Sciences teachers in Basic General Education of the "22 de Marzo" Educational Unit in the canton San Lorenzo, Province of Esmeraldas, Ecuador. It is essential to guarantee the preparation of teachers to analyze and apply the guide to using Genially proposed as a fundamental result of this research. This will maximize its impact on meaningful learning and student motivation, particularly in the teaching-learning context of Natural Sciences.

BIBLIOGRAPHIC REFERENCES

- Acosta, D., Hernández, P., & Onofre, V. (2020). Habilidades sociales y su impacto en la educación del individuo. *Revista de Investigación e Innovación Magazine De Las Ciencias.*, 5, 430-449.
- Andrade, R., Carpio, R., & Sánchez, M. (2022). La educación mediada por las tecnologías durante la pandemia por COVID 19, desde la mirada de los estudiantes: aprendizajes y experiencias. *Revista Científica de Ciencias Sociales y Humanas* (80), 113 - 123.
<https://revistas.uazuay.edu.ec/flip/uverdad/080/uazuay-uverdad-080-07.pdf>
- Castro, D., & Ochoa, S. (2021). Gamificación en el proceso de interaprendizaje: Una experiencia en biología con Genially. *CIENCIAMATRIA*, 7(3), 249 - 272.
<https://www.cienciamatriarevista.org.ve/index.php/cm/article/view/579/874>
- Centeno, R., & Acuña, L. (2023). Competencias digitales docentes y formación continua:

<https://mendive.upr.edu.cu/index.php/MendiveUPR/article/view/3722>

- una propuesta desde el paradigma cualitativo. Revista Latinoamericana de Tecnología Educativa-RELATEC, 22(2), 119 - 137.
<https://relatec.unex.es/index.php/relatec/article/view/4722>
- Chaparro, C., Ramírez, J., Martínez, J., Ruiz, E., & Leiva, M. (2022). Pertinencia en el uso de las plataformas educativas prácticas de uso libre y su aplicación en el área de ciencias naturales en la educación media de instituciones educativas del sector oficial del departamento central. Ciencia Latina, 6(6), 12205-12219.
<https://ciencialatina.org/index.php/cienciala/article/view/4248/6515>
- Díaz, D., & Loyola, E. (2021). Competencias digitales en el contexto COVID 19: una mirada desde la educación. Revista Innova Educación, 3(1), 120 - 151.
- Franco, J. (2021). La motivación docente para obtener calidad educativa en instituciones de educación superior. Revista Virtual Universidad Católica del Norte (64), 151 - 179.
<https://www.redalyc.org/journal/1942/194267200007/html/>
- Garzón, A., Segovia, J., & Mora, R. (2022). Estudio de la Brecha Digital y el Proceso de Enseñanza- Aprendizaje en Ecuador- Caso De Estudio: Universidad Técnica De Machala. Revista Angolana de Ciências, 4(2), 1 - 22.
<https://www.redalyc.org/journal/7041/704173402006/html/>
- Instituto Nacional de Formación Docente. (2020). Tutorial Genially. Argentina.
<https://red.infed.edu.ar/wp-content/uploads/2020/04/Tutorial-Genially.pdf>
- Logroño, L., Ramos, D., & Tello, D. (2023). Recursos digitales en la asignatura de ciencias naturales. Pentaciencias, 5(5), 228 - 244.
<https://www.editorialalema.org/index.php/pentaciencias/article/view/731/1019>
- Mejía, N., García, D., Erazo, J., & Narváez, C. (2020). Genially como estrategia para mejorar la comprensión lectora en educación básica. Cienciamatria revista, 7(1), 15.
<https://www.cienciamatriarevista.org.ve/index.php/cm/article/view/413>
- Rivas, H., & Alcívar, A. (2023). Uso de la plataforma Virtual Zoom como estrategia para mejorar el aprendizaje de las Ciencias Naturales. Revista científica MQR Investigar, 7(1), 10 - 20.
<https://www.investigarmqr.com/ojs/index.php/mqr/article/view/269>
- Simonelli, M. (2019). Integración de las TIC en las ciencias naturales para el desarrollo de las competencias: caso UPEL - IPMAR. Investigación y Postgrado, 34(2), 9-37.
- Sunkel, G., Trucco, D., & Espejo, A. (2023). La integración de las tecnologías digitales en las escuelas de América Latina y el Caribe. Una mirada multidimensional (Primera Edición ed.). CEPAL-Naciones Unidas.
<https://repositorio.cepal.org/server/api/content/bitstreams/1430a3ff-1b88-4a49-a8e1-037f89bd77e6/content>
- Tomalá, M., Gallo, G., Mosquera, J., & Chancusig, J. (2020). Las plataformas virtuales para fomentar aprendizaje colaborativo en los estudiantes del bachillerato. Recimundo, 8, 199-212.
<https://www.recimundo.com/index.php/es/article/download/899/1622?inline=1>

<https://mendive.upr.edu.cu/index.php/MendiveUPR/article/view/3722>

<https://mendive.upr.edu.cu/index.php/MendiveUPR/article/view/3722>

Conflict of interests:

The author declares that she has no conflicts of interest.

Authors' contribution:

The author participated in the design and writing of the article, in the search and analysis of the information contained in the consulted bibliography.

Cite as

Pérez Barrera, H. M. (2024). Implementation of Genially as a strategy in the teaching-learning process of Natural Sciences. *Mendive. Journal on Education*, 22(3), e3722.

<https://mendive.upr.edu.cu/index.php/MendiveUPR/article/view/3722>



This work is licensed under a [Creative Commons Attribution-NonCommercial 4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/)