

Digital Game-Based Methodology: Active Learning in Elementary Education in Brazil

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Abstract

Partnering can be the starting point for effective learning process in schools in the 21st century, says professor and book writer Marc Prensky, in his publication of 2010. Prensky's perspective posits that technological tools are continually becoming more compact, swifter, and superior in quality. Unquestionably, the younger generation will manifest a pervasive inclination to integrate these tools into their daily activities. Concurrently, a juxtaposition arises with educators who are accustomed to traditional instructional methodologies involving lectures, presentations, and the dissemination of their own expertise. In contrast with this didactic approach, active learning methods are emerging as alternative pedagogical teaching. In the present-day educational scenario, the Alpha generation comprises a significant majority of primary school pupils, thereby requiring a distinctive pedagogical framework characterized by unique attributes and emerging complexities for educators. This way, the undertaken investigation seeks to showcase the effective deployment of game-based Methodology, with a particular focus on the application of interactive platforms like *Kaboo!* and *Nearpod* for the instruction of the English as an Additional Language. The research is rooted in a qualitative paradigm, grounded in action research (Stinger, 2014) and guided by the theoretical framework of multiliteracy pedagogy (Coscarelli; Ribeiro, 2017; Rojo, 2009). This theoretical stance accentuates active and interactive learning modalities. In this empirical inquiry, instructional propositions were implemented during the early stages of primary education within two privately administered educational institutions situated in the municipality of João Pessoa, Paraíba, Brazil. The outcomes of the study demonstrate a favorable reception among students and parents concerning the assimilation of educational games into the pedagogical process. Consequently, it can be deduced that digital game-based methodology has the potential to function as a crucial constituent in the evolution of contemporary pedagogical methods, thereby motivating other educators to delve into its merits in order to augment student involvement and align with the exigencies of the contemporary learners.

Palavras-chave: Alpha Generation, Multiliteracies, Digital Games, English as an Additional Language.

1 Introduction

In his 2010 book the professor and book writer Marc Prensky proposed a way to ensure student's learning in the 21st century: partnering. In his opinion, technology tools are getting smaller, faster and better. And, no doubt, the young people will want to use it everywhere, every time. On the other side, there will be teachers who are used to lecturing, presenting, and exposing their knowledge. The opposite of this kind of teaching is partnering (Prensky, 2010). There is a new generation in schools nowadays. They are growing up surrounded by technology, in deed of educators to reflect upon their teaching methodologies to engage this new kind of students. They are known as Alphas (McCrindle; Fell, 2021) are maturing in a world vastly distinct from any preceding generation. A substantial disparity emerges when comparing today's children with their teachers' generation. From an early age, these children effortlessly interact with digital devices, navigating touch-sensitive screens with instinctive ease.

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Their world is full of movement, colors, videos, and the skip button (when they don't like something they're watching). There must be a kind of partnership between them, otherwise there will be neither teaching nor learning. In this scenario, the whole pedagogy is coming into a reframe, and active learning methodologies are being considered very beneficial for both students and teachers (Prensky, 2010; Bacich & Moran, 2018; Gee, 2013). As technology continues to be an integral part of Alphas' lives, incorporating digital literacy into educational practice becomes imperative. However, educators must know that it is worth noting that digital literacy encompasses only the ability to use digital tools, it must also promote the capacity to critically evaluate and create content in the digital realm. It involves the "expansion of the range of possibilities for contact with writing in a digital environment" (Coscarelli; Ribeiro, 2017, p. 9).

This perspective aligns with the Brazilian norms for education: the National Common Curricular Base (BNCC), which presents the competencies to be developed throughout basic education, including the ability to "reflect on different social contexts and situations in which oral texts are produced and the formal, stylistic, and linguistic differences that these contexts entail, including multimodality and multisemiosis" (Brasil, 2018, p. 79). By fostering these skills from the outset, young learners establish a solid foundation for success in an increasingly technology-driven world. Moreover, with the rise and ongoing proliferation of access to digital information and communication technologies (ICTs), consideration must be given to the "multisemiotic literacies demanded by contemporary texts, expanding the notion of literacy to include fields such as image, music, and other semiotic modes beyond just writing" (Rojo, 2017, p. 107).

In this context, the development of digital literacies highlights an important concept proposed by Mendonça (2018): technological appropriation. According to the author, it is necessary for "students to be able to appropriate educational technologies that are more complex than those used in their daily lives. Through this appropriation, students can intervene in the processes of creation and development of new technologies" (Mendonça, 2018, p. 114).

Engaging these children in the learning process can pose a challenge, particularly for teachers with many years of classroom experience who may have entrenched traditional approaches. However, "making teachers proficient in the integrated use of digital technologies within the curriculum is important for modifying an approach that translates into better student learning outcomes" (Bacich, 2018, p. 130). Therefore, instead of the traditional teaching methods, as mentioned before, integrating digital literacy and active methodologies, such as digital game-based learning, has proven to be a promising solution for today's youth. By incorporating elements of play into a learning context, educators can capture children's attention, enhance their motivation, and improve the overall learning experience.

The hypothesis of this study is that the use of interactive games such as Kahoot! and Nearpod adds an exciting dimension to the classroom, promoting active participation and collaborative learning. Additionally, tablets serve as learning tools, bridging the gap between traditional teaching methods and modern learning preferences. It is also a goal to reach the parents, as they are going to fill in a form. It should be noted that in schools where pedagogical proposals were implemented, students are prohibited from bringing tablets, phones, or any other digital or interactive devices. Therefore, bringing tablets into the classroom produced the initial challenge. Emphasizing student characteristics and well-structured planning, linking activities to the curriculum, were necessary arguments to convince both school coordination and administration to allow the proposal.

Given this backdrop, the chosen focus for this research was to explore the integration of digital game-based learning methodology in elementary education, with the aim of investigating the role of digital literacy in shaping the educational experiences of children aged 7 to 9, and the impact of game utilization on the teaching and learning process. Given the foregoing, the overarching objective of this study was to identify the effects of utilizing digital games in three classes from the early years of elementary education: one from 1st grade, using the Kahoot! application, and two from 3rd grade, employing Nearpod. All the classes belonged to private schools located in João Pessoa, the capital of the state of Paraíba, Brazil. By documenting the experiences of students, parents, and teachers, the goal is to share insights into the transformative potential of digital games in basic education.

2 Theoretical Discussions

In the current educational landscape, in general, computers have become essential as they "allow interaction with real-time applications, personalized or group learning development, and research on various topics" as exemplified by Tajra (2019, p.55). However, technology alone is not sufficient. It is imperative that teachers employ technological resources aligned with educational planning so that they function as tools to support the chosen methodology for their classes.

In this regard, this study sought as theoretical foundations the research on the Alpha generation, especially McCrindle and Fell (2021), the utilization of interactive games in basic education, the new recommended active learning methodologies, and attitudes for teaching children in the 21st century. The following items describe these points.

2.1 A new Generation

It is a fact that education plays a fundamental role in children's lives, as it prepares them for socio-interaction, their future professions, and assists in developing the skills and competencies necessary for them to become well-rounded adults. However, it is acknowledged that each generation has its own distinct way of learning, based on different stimuli and methods. For McCrindle and Fell (2021), the Alpha generation (children born from 2010 on) is the one that will suffer the most from the strong social isolation they had to undergo during the Covid-19 pandemic. Furthermore, educators need to understand "that this generation is highly connected through digital devices and engaged through social media" (McCrindle; Fell, 2021, p.188). Excluding these items from the classroom and insisting on lecture-style classes will not yield positive results in learning.

In this context, Gee (2013, p. 16-17) points out significant errors of contemporary schools, the two first are: "1- Much of formal schooling is devoted to listening and reading, not to taking actions in the world that are relevant; 2- Often students can see no clear goal for what they are learning." In line with this thinking, Prensky (2021) describes what he calls "content in advance," which means schools are delivering subjects that are not part of students' daily lives but *might be* useful knowledge in the future. Consequently, these learners struggle to find meaning in what they are receiving from their teachers, and little is retained as learning.

According to Prensky (2023, p. 5), if schools want to "prepare young people for the time they will live in, which is the 21st century, probably the second half of the 21st century, they had better make sure students know how to use all parts of their body. And technology is becoming a new part of the body. I call this symbiosis." In other words, it is no longer possible to separate today's youth from the devices they use. Therefore, it is essential that educational institutions and teachers are prepared for new methodologies that align with students' desires and expectations, aiding in their potential and the development of meaningful competencies, as we will see in the next topics.

2.2 Interactive Games and Active Methodologies in class

The current literature underscores that active methodologies are pedagogical approaches that place the student at the center of their own learning, encouraging active participation, autonomy, and collaboration. In contrast to the traditional model of lectures where the teacher is the focal point and holder of knowledge, active methodologies foster dynamic and interactive learning. According to Moran (2018, p. 4), "active methodologies emphasize the student's protagonist role, their direct, participatory, and reflective involvement in all stages of the process, experimenting, designing, creating, with the guidance of the teacher."

It is increasingly recognized that learning based on the transmission of knowledge from teacher to student holds relevance, but learning through active student participation via questioning and experimentation triggers a broader and deeper understanding (Moran, 2018). McCrindle and Fell (2021) argue that methods based on questions or problems are important for the Alpha generation. According to these authors, contemporary classes should shift from being curriculum and content-centered to student-centered, with students assuming collaborative responsibilities and the teacher as a facilitator. "Through analysis, reflection, collaboration, and communication, students explore and respond to questions. This requires a degree of curiosity and puts the student at the center of the process" (McCrindle; Fell, 2021, p.78).

These ideas go well together with the concept of partnership proposed by Prensky (2010) and mentioned in the introduction of this paper. For the author, students should be responsible for : "Finding and following their passion; Using whatever technology is available; Reaching and finding information; Answering questions and sharing their thoughts and opinions; Practicing, when properly motivated (eg through games); Creating presentations in text and multimedia (p.13)."

Achieving deeper learning, as said by Moran (2018), necessitates conducive environments where frequent practices and the "learning by doing" approach are favored. To enable this approach, multisensory stimulation and consideration of students' prior knowledge are crucial elements in consolidating new knowledge. Within this context, the importance of an active approach, always in conjunction with reflective learning, is emphasized, aiming to make the processes, knowledge, and competencies acquired in each activity visible. Under this perspective, learning transforms into an ongoing journey of discovery, a constant way of being, and a process of progressive enhancement.

Among the numerous active methodologies present today, digital game-based learning stands out. It involves competitions, challenges, rewards, and teamwork. The games stimulate students' intrinsic motivation, increasing their interest in content and encouraging persistence in learning. Interactive digital games are powerful tools for educating the Alpha generation. With engaging audiovisual resources, immediate interactions, and the potential for experience customization, digital games create an immersive environment conducive to cognitive, emotional, and social development of students.

According to Caillois (2017, p. 15), "the word game also suggests ideas of ease, risk, or skill." Thus, teachers must be cautious when introducing games in the classroom. In general, games should serve not only to teach or reinforce content but also to stimulate teamwork and help students understand that there are predefined rules that determine what is allowed and what is prohibited. This is also part of their constitution as citizens in a very diverse world. Furthermore, digital games can be adapted to various curriculum content, making teaching more contextualized and meaningful for students. By experiencing challenging situations and problem-solving within game contexts, students develop skills like critical thinking, collaboration, decision-making, and conflict resolution. The transition from lecture-style teaching to student as protagonist is a paradigm shift that requires efforts from both educators and educational institutions. Teachers take on the role of mediators, facilitators, and guides of the learning process, creating collaborative and stimulating learning environments.

The focus is not merely on conveying information but on stimulating curiosity, encouraging knowledge-seeking, and fostering the development of skills required to face the challenges of the 21st century. In this regard, Lemke (2010, p. 475) warns that "We certainly cannot continue teaching our students only the literacies of the mid-20th century or just present to them the more advanced and diverse literacies of today." For the author, it is the school's and teacher's role to help this generation learn to use new literacies wisely. In this scenario, the use of active methodologies such as digital game-based learning allows educators to explore new pedagogical strategies aligned with the characteristics and interests of the Alpha generation students.

3 METHODOLOGICAL PROCEDURES

Due to its qualitative nature and the presence of the teacher who was interested in addressing the issue of student engagement in the classes, as well as promoting digital literacy among early elementary school students, the decision was made to follow the methodology of action research. According to Stringer (2014, p. 36), this type of method "is grounded in the qualitative research paradigm whose purpose is to attain clarity and understanding in the face of a particular problem or subject."

The presence of the teacher-researcher is crucial for the success of this type of intervention, given that these are very young children, and the presence of an external person might potentially lead to some form of discomfort. For Bortoni-Ricardo (2008) the teacher-researcher is essential for science because they are "not only a user of the knowledge produced by other researchers, but also offer themselves to contribute their knowledge about professional pedagogy in order to share best practices" (p. 46). In this sense, active methodologies, in general, promote the transformation of how education was conceived up to the 20th century. Currently, they aim to develop competencies, skills, and knowledge in a diverse manner, with the student as the protagonist (Sefton & Galini, 2022). In other words, the lesson ceases to be solely expository and teacher centered. In the specific case of this research, considering the characteristics of the students, the decision was made to employ the methodology known as Game-Based Learning.

The initial step was the preparation of games, and the choice was Kahoot! for the 1st-grade class, as the students had never used any form of digital device in the classroom and Kahoot!'s interface is more intuitive and easily comprehensible. Given that personalization is one of the traits of the Alpha generation, photos of the students themselves were incorporated into the questions, as illustrated in the example shown in Figure 1 below.

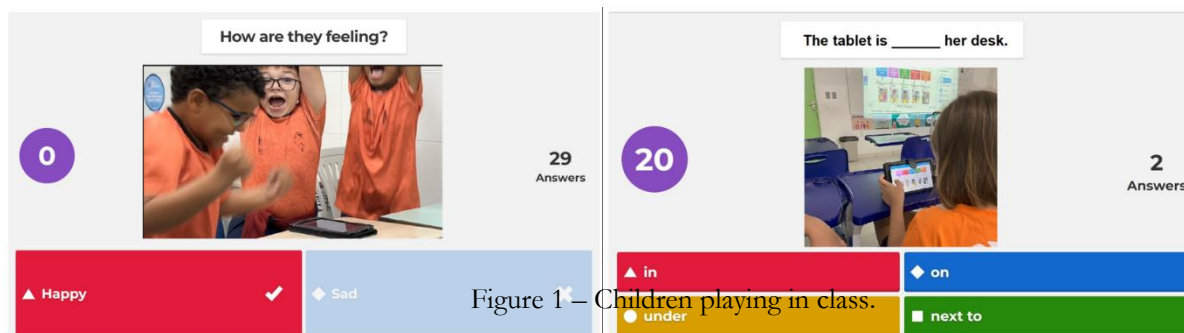


Figure 1 – Children playing in class.

It was possible to notice, immediately, the students' surprise and interest not only in using the tablets in the classroom, but also with the appearance of each one in the photos of the activities. The students, despite their young age, 7 to 8 years old, had no difficulty using the application, even though it was the first time they had done this type of activity. The questions were used to review content seen in the quarter that would be the subject for the upcoming exam. First, only questions with two answer options were inserted, to then include questions with four options. All were given 30 seconds to respond. For the two 3rd year classes, who already have a beginning of digital literacy and had already used computers and tablets to carry out activities not only in the English discipline, but also in other components of the curriculum, it was chosen to work with the Nearpod application, due to the different types of activities that the platform presents, figure 2, below shows them during the class.



Figure 2 – Students playing in Class

On the day of the class for this didactic proposal, the following activities were carried out: matching pairs, fill in the blanks, draw it and time to climb. In the first activity, students needed to find pairs: images and vocabulary words studied in the lesson, making them associate verbal and non-verbal elements. In the second activity, students needed to fit the words from activity 1 into sentences, that is, with the help of context so that they could effectively use the learned vocabulary. In the third activity, more playful, students received a sentence and had to represent it through a drawing. The last activity is a quiz, with questions and answers in which each correct answer takes each participant to a higher point on a mountain, and students only find out who reached the top first at the end of the game.

The next topic will present and discuss the results, the impressions of students and parents and the impact on the teaching-learning process.

4 Results and Discussion

In this section, the results obtained from the application of active methodologies are shown, especially digital game-based method, in the early years of elementary school, with a focus on the alpha generation. In addition, the positive repercussion of these approaches is discussed, both among students and with parents, through data obtained from questionnaires.

4.1 Results collected from students

After the class with the use of digital games, described in the previous section, a simple and colorful questionnaire was carried out, as shown in figure 3, below, with the students to assess their perception in relation to the learning experience and the use of the proposed game for that one. classroom.



Figure 3 – Kid’s Assessment

This questionnaire was applied to both groups after the class. Of the students who participated in the survey, 96% assigned the maximum grade to the class. Also noteworthy is the high percentage of acceptance of the platforms, as 94% marked the option “I loved it”, in relation to Kahoot! and 90% for Nearpod. This result shows the high satisfaction of students with the pedagogical strategy used, demonstrating that interactive digital games were able to engage and motivate students in their learning process. All students who filled out the questionnaire, in the three classes, indicated that both platforms were “easy”, but when asked about playing the same game again, 5% said they did not want to play Kahoot! again and 100% would like to repeat Nearpod. The hypothesis for these responses is that Kahoot! it has a more competitive atmosphere, and some students don't feel comfortable when they lose. However, this is also part of the socio-emotional learning proposed by the teacher. And a topic to discuss with them in sequent classes.

4.2 Parents’ opinions

Parallel to the research carried out with the students, a questionnaire was applied to parents or guardians to assess their perception of the class. An explanatory note was placed in each student's agenda, with a Qr-code that pointed to a Google form. The results showed that 84.2% of parents reported that their children commented on the classes with them, and of these, 57.9% did so spontaneously, that is, without the parents asking as shown in figure 4. In this way, it is perceived that the students were engaged and enthusiastic enough to share their educational experiences with their tutors.

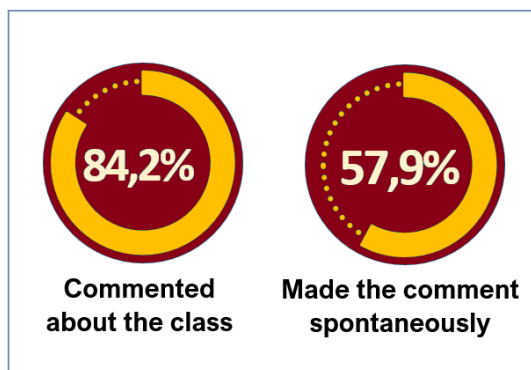


Figure 4 – Parents’ form

These data gain more relevance when 52.6% of parents admit that their children do not usually comment every day about what happens in class and 36.8% only speak when asked, as shown in Figure 5.

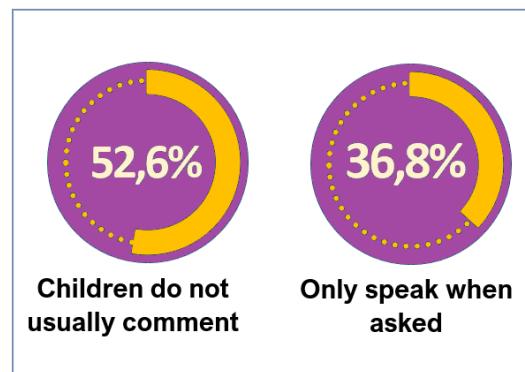


Figure 5 – Parents' form

As can be seen in the graphic, talking about classes spontaneously is not common for these groups of students. It is noticed that, if they commented, even if stimulated by the parents' question, it was probably a special, different day, a day when they liked the class. And taking pleasure in studying a subject, engaging with the content presented is the first step to success. If the child is happy with the activities being carried out by the teacher in the classroom, there are more chances of retaining the content taught, that is, of really learning and in a meaningful way. For an educational institution to be successful, it is necessary to have great harmony between the entire school community: students, parents, teachers, and management. However, sometimes parents do not follow their children's daily lives and do not interact frequently with teachers or coordinators. Therefore, the parents' perception when listening to their children's reports is quite relevant, as it was possible to inform them positively about a class held in the English class.

The results obtained from parents, as shown in Figure 6, corroborate the relevance and positive impact of active methodologies in student education, especially interactive games. The tutors' perception of the increased interest and motivation of their children demonstrates that these approaches have the potential to transform the students' relationship with the learning process, making it more meaningful and pleasurable.



Figure 6 – Parents' form

Communication between students and their parents regarding school activities reflects greater integration between the school and the family, which can strengthen the educational process as a whole. The participation and involvement of parents in this context are essential to support and encourage student progress and strengthen ties with teachers. In an open-ended question on the form, parents reported what students said:

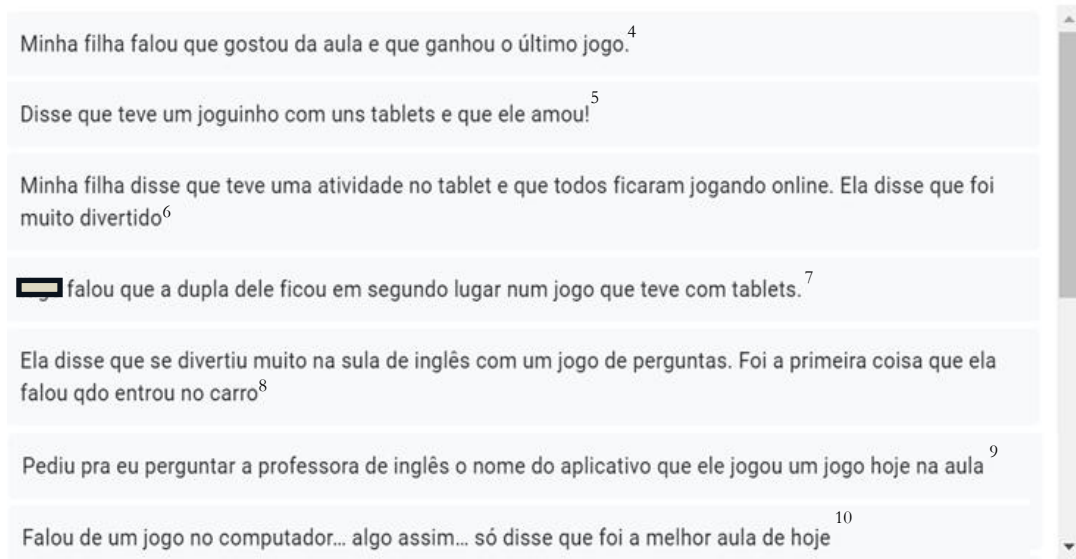


Figure 7 – Parents' comments

The positive comments corroborate the impression that the students themselves gave in the classroom, and, in addition, strengthen the parents' bond with the school. This fact is particularly relevant because it is a component that is not part of the curriculum proposed by the BNCC for the early years of elementary school and there are always questions from parents about the early insertion of another subject, the need for tests, among others.

The word that appeared in all the comments on the open question, presented in Figure 7, was “game” and its derivatives, some highlighting the fact that it is online or interactive. All the comments were positive that the students gave to their parents spontaneously or encouraged, but that indicate that the activity was positive.

It is noticed that some characteristics of the games, such as “there were some stick figures and I had to climb a mountain”. Ranking, winning, and losing issues were also pointed out, however, even students who reported having lost said they had fun. It is known that the Alpha generation is very competitive and in both schools the importance of winning and losing has been worked on, without students who win acting presumptuously and those who lose see the fact as a learning opportunity. These were themes worked on in classes prior to the application of the didactic proposal. Another widely reported point was the use of tablets in class. This was perhaps the most surprising moment for the students, since, as previously mentioned, they are prohibited from taking any digital device to school.

In the next topic, the final considerations on the activities carried out in the three classes are reflected and shared.

5 Final Considerations

The results and discussions presented in this study show that the use of active methodologies, especially gamification and interactive digital games, in basic education, is a promising strategy to engage and motivate students of the alpha generation. The high satisfaction of the students, reflected in the majority of the responses, attributing the maximum score to the activity, as well as the interest shown in sharing educational experiences with their parents, highlight the relevance of these approaches in transforming the way of teaching. Another aspect that we highlight is the fact that the use of active methodologies, when applied in an appropriate and planned way, have the potential to engage students in a meaningful way, promoting the pleasure of learning and preparing them to face the challenges of the contemporary world.

⁴My daughter said she liked the class and that she won the last game.

⁵He said there was a game with some tablets, and he loved it!

⁶My daughter said that there was an activity with the tablet and that all the students played online. She said it was fun.

⁷(...) Said he and his partner were second in a game with tablets.

⁸She said she had a lot of fun in the English class with a game quiz. It was the first thing she mentioned when she entered the car.

⁹She told me to ask the English teacher the name of the app he used in class today.

¹⁰(...) talked about a computer game... something like that.... And that it was the best class today.

However, it is essential that the implementation of these methodologies be accompanied by ongoing training for teachers, the responsible use of educational technologies and the adequacy of pedagogical resources to educational objectives. Building a more innovative and student-centered education requires a joint effort by educators, managers, families and society itself to recognize the importance of change and invest in the future of basic education. The high student satisfaction rate suggests that the transition from lectures to a more active, student-centered approach is welcomed by students. This change enables the construction of knowledge in a more meaningful way, since students are encouraged to explore, question and apply the content in concrete situations.

Thus, we conclude that, in our research context, the adoption of active methodologies requires continuous reflection and improvement on the part of educators, aiming at a pedagogical practice that is more aligned with the needs and characteristics of the generations of students who are in the classroom today. Parent engagement is essential to support and enhance the benefits of these strategies, consolidating education as a collaborative and enriching experience for students, preparing them more effectively for the challenges of the future society in which they will live as adults. Also, the research proved that partnerships between teachers, students and parents are very efficient for the learning process.

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