LUMEN ET VIRTUS
ISSN: 2177-2789

DIGITAL PATHS IN EDUCATION: A STUDY ON THE FREQUENCY OF USE OF TECHNOLOGICAL TOOLS IN PHYSICAL EDUCATION CLASSES IN THE CITY OF GURJÃO-PB

https://doi.org/10.56238/levv15n41-113

Submitted on: 09/31/2024 **Publication date:** 10/31/2024

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ABSTRACT

The excessive use of digital screens has been associated with several negative impacts on the health and socio-emotional and motor development of children and adolescents. In this context, digital technologies have become both a challenge and an opportunity for education. The present study investigates the frequency and contexts in which Physical Education teachers use technological tools as didactic resources in schools in Gurjão-PB. The research adopts a mixed methodological approach, combining quantitative and qualitative methods, including an online survey and virtual interviews. The sample is composed of graduates in Physical Education who teach in public schools in Gurjão-PB. The results highlight the relevance of digital tools for student engagement, but also point to challenges related to technological infrastructure, teacher training and the availability of resources. Effectively integrating digital technologies into education requires concerted efforts by teachers, educational institutions, and governments to overcome infrastructural challenges and explore the potential of these tools to improve the quality of teaching and learning.

Keywords: Digital Learning. Physical education. Excess of Screens. Gurjão. Digital Technologies.

INTRODUCTION

There is evidence that demonstrates the sudden advance of technologies. Over the past two decades, a growing body of evidence has suggested that excessive exposure to screen use results in negative health effects, such as excess body weight, obesity, diabetes, socio-affective problems, changes in dietary patterns, regardless of physical activity (Tremblay et al., 2011).

With the sudden advance of digital technologies, the importance of studies like this arises, because screens, or rather their misuse, have become one of the biggest villains of child and adolescent health. This phenomenon covers a number of aspects, starting with mental health and in relation to extrinsic factors, many authors have been increasingly relating it to the excessive use of electronic media, since there is a growing increase in the spending of leisure time in front of screens by the pediatric age group (Twenge et al., 2018).

Constant exposure to virtual content, often distorted and idealized, can generate psychological pressures, anxiety, and even depression in young people who seek to fit into unattainable standards propagated by social media. It is recommended by the Brazilian Society of Pediatrics (SBP) that screen time for children aged 6 to 10 should be up to one or two hours a day, while that for adolescents aged 11 to 18 should be a maximum of two or three hours a day (SBP, 2020). Time spent in front of screens has already been associated with an increased risk of anxiety in young people (Khouja, et al., 2019).

In recent times, according to Orrico (2013), the world has experienced a great technological advance, making people routinely access a vast amount of information, through the dissemination of the use of the internet, with the use of technological devices. In addition, excessive time spent in front of screens has contributed to social isolation and the loss of interpersonal skills. However, the influence of screens is not limited to mental health, it also directly affects physical health, with the emergence of postural problems due to long periods of use of mobile devices. The lack of physical activity resulting from sedentary behavior is another growing concern, contributing to an obesity epidemic among children and adolescents. In addition, excessive exposure to blue light from screens can impair circadian rhythms, affecting the quality of sleep in these age groups.

> Technological advancement has been present in all sectors of social life, and in education it could not be different, because the impact of this advance is effective as a social process reaching all institutions, invading the life of man inside his home, on the street where he lives, in the classrooms with students, etc. In this way, technological devices direct their activities and condition their thinking, their acting, their feeling, their reasoning and their relationship with people. (Dorigonil; Silva, 2012, p. 3).

It is essential to recognize that digital technologies also offer a wide range of opportunities and benefits, especially in the educational field. From the point of view of UNESCO (1984) it is understood "that it is appropriate to understand the study, teaching and learning of the modern means of communication and expression, considered as part of a specific and autonomous field of knowledge, in pedagogical theory and practice".

By exploring the positive side of these tools, we can find a multitude of possibilities in the didactic field. It is not necessary to run away from traditional teaching methods, on the contrary, both can go together. The great techno-informatics revolution has presented us with new realities and possibilities that can transform the way we learn, interact and develop as individuals and society.

> The technological society is predominantly characterized by the advancement of digital communication and information technologies, and microelectronics, such as computers, DVDs, digital television, cell phones, software, internet, among others. These new information and communication technologies are already materializing as an educational reality, enabling a sudden change in the way of thinking and doing education. (Lima, 2007, p. 05).

In this study, we explore both the challenges and the opportunities that digital technologies offer for the health and education of children and adolescents, seeking a balance between the negative and positive aspects of these tools in their lives, in view of these aspects, linking to our reality this research aims to identify the frequency and the way in which physical education teachers use technological mechanisms as a didactic tool, in schools in the city of Gurjão-PB.

METHODOLOGY

The methodology adopted in this study is both quantitative in nature, based on an online *survey* with exploratory and descriptive cross-sectional purposes, at this point data collection occurred through a questionnaire (APPENDIX II) sent to the interviewees from *Google Forms*, and qualitative, from an online interview, focused on understanding more subjective aspects, such as behaviors, ideas, points of view, personal experiences, interview conducted through the digital meeting platform *Google Meet*.

TYPE OF RESEARCH

The present study presents a mixed quantitative and qualitative, observational, cross-sectional approach. Quantitative research is a method of social research that uses quantification in the modalities of information collection and treatment, through statistical

techniques, such as percentage, mean, standard deviation, correlation coefficient, regression analysis, among others. They are often used when it is necessary to ensure the accuracy of the results, therefore, quantitative research is achieved in the search for exact results evidenced by means of pre-established variables, in which the influence on the variables is verified and explained, through analysis of the frequency of incidences and statistical correlations. (Michel, 2005).

According to Maanen (1979, p.520), the expression "qualitative research" acquires several interpretations in the scope of the social sciences, encompassing a set of distinct interpretative techniques aimed at describing and decoding the elements of a system of complex meanings. Its purpose lies in translating and expressing the meaning of the phenomena of the social world, seeking to reduce the distance between indicator and indicated, between theory and data, and between context and action.

POPULATION AND SAMPLE

The population is the total group of interest for the research. In this case, the sample consists of all graduates in Physical Education who are teaching in public schools in the city of Gurjão-PB, from kindergarten to high school and EJA and who meet the established inclusion criteria, that is, they are graduates in Physical Education, teachers of basic education in Gurjão-PB and currently teaching in the city, totaling 3 teachers, the municipality has only 3,242 inhabitants (IBGE, 2024).

DATA COLLECTION PROCEDURES

A structured questionnaire was applied with physical education graduates in the city of Gurjão-PB who are teaching in public schools, (since there are no private schools in the municipality), from kindergarten to high school and EJA. After analyzing the data collection, an interview was conducted taking into account the subjective aspects, for a better interpretation of their answers to the questionnaire, taking into account the interviewees' points of view, main daily difficulties, personal experiences and suggestions.

ETHICAL ASPECTS

Respecting the ethical aspects in accordance with Resolution No. 466/2012 of the National Health Council, the research was forwarded to the Ethics and Research Committee with Human Beings of the State University of Paraíba, and approved under the number 70662523.1.0000.5187. In addition, all participants who agree to participate in the study will have to sign the Informed Consent Form (APPENDIX I), in addition, they were

informed about the objectives of the study, the possible risks and benefits, as well as the entire data collection procedure.

- Inform participants about the objectives of the study, the possible risks and benefits of the research.
- Obtain the (digital) signature of the participants to participate in the study.
- The participants signed the Informed Consent Form (ICF).
- Respecting all ethical aspects, including the submission of the research to the Ethics and Research Committee with Human Beings of the State University of Paraíba.
- Respect for the ethical standards set forth in Resolution No. 466/2012 of the National Health Council.
- Free and Informed Consent: All participants who agree to participate in the study must sign the Informed Consent Form, being informed about the objectives, risks and benefits of the study.

DATA COLLECTION INSTRUMENT

The data collection instruments were: 1. Questionnaire created by the authors from an online *survey* (APPENDIX II), the questionnaire was previously developed in a scientific article on the use of educational technologies by physical education teachers. The questionnaire was applied to graduates in Physical Education in the city of Gurjão-PB who met the established inclusion criteria, considering that the research was carried out online, the participants answered the questionnaire via the internet, ensuring anonymity and confidentiality; 2. The interview was conducted online, through the videoconferencing platform *Google Meet*. Based on the interview script (APPENDIX III), the interviewees were the same participants mentioned above and questions pertinent to the research objectives were addressed, such as the use of technological resources in classes, perceptions about their effectiveness, challenges faced and suggestions for improvements. In addition, open-ended questions were included to enable the emergence of new information and *insights* not initially anticipated. The interviews were conducted individually, recorded and later transcribed, ensuring the fidelity of the information collected and facilitating data analysis. The analysis of the interviews was carried out qualitatively, using categorization and organization techniques to identify patterns, trends and recurring themes.

VERIFICATION OF THE INCLUSION CRITERIA

To identify the graduates in Physical Education who teach in public schools in the city of Gurjão-PB. Verify that potential participants meet the inclusion criteria set out below:

- Have a degree in Physical Education;
- To be a teacher of basic education in the city of Gurjão-PB;
- Be teaching in the city currently; Sign the Informed Consent Form (ICF);
- Answer the complete questionnaire;
- Agree to participate in the interview.

DATA ANALYSIS

After data collection, the results of the questionnaire were statistically analyzed, using mean and sum formulas arranged in Excel, and graphs were generated, based on the parameters already structured in the questionnaire to reach the conclusions and answers investigated. The interviews were analyzed taking into account the main aspects pointed out, experiences, perspectives and suggestions of the participants in a qualitative way, using categorization and organization techniques to identify patterns, trends and recurring themes.

RESULTS AND DISCUSSIONS

The contemporary context of education faces significant challenges related to student attention and participation, influenced by the excessive use of mobile devices, especially cell phones. The lack of attention and response of students during educational activities is attributed to their immersion in digital screens, from the perspective of Gurjão-PB where entertainment surpasses educational functionality. This reality is reflected in evident losses, especially in theoretical classes, where the potential of technologies to assist in the teaching and learning process is underutilized.

At the present time, the area of education experiences a chance to ponder on the application of the teacher in relation to the use of pedagogical technologies, which provide multiple possibilities for interaction, fun, communication and research, playing a constructive role in the generation and acquisition of knowledge (Lima *et al.* 2021).

In this way, the teaching and learning method can be improved by such technologies, exemplified by the Internet, which offers a variety of data, media and software, which collaborate for this learning process. Considering that the integration of technological tools in teaching is progressively essential, since it makes the class more captivating, providing students with a differentiated approach to teaching, "[...] strengthening their capacities to

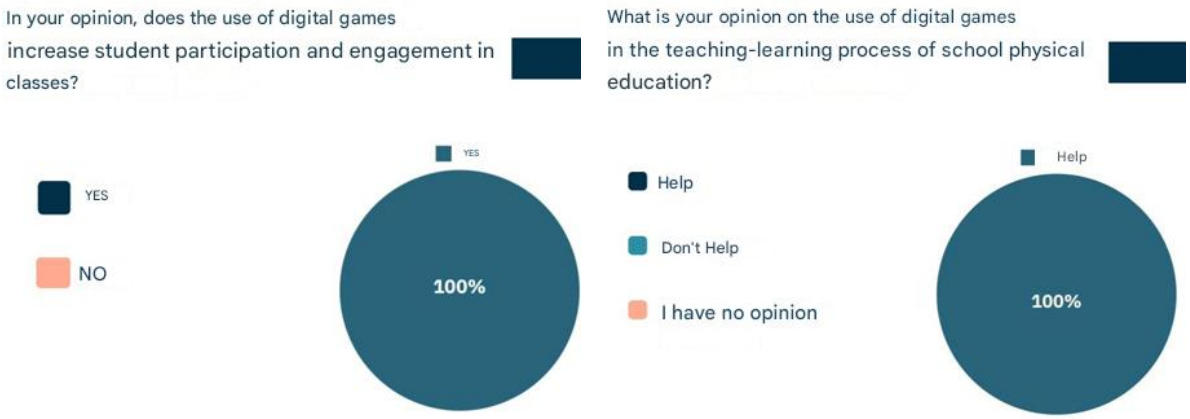
create, reason and make decisions" (Pontes, 2022, p.9). As reported by some of the interviewees when asked about: What is your opinion about the use of technological resources in the teaching-learning process of school physical education?

> "I believe that technology comes to add and increase our work tools, thus being able to help us and improve our day-to-day practice" (Interviewee A, 2024).

> "They are important tools not only for physical education, but in many areas of knowledge! In physical education, the class becomes more attractive, bringing the student closer to a more practical and objective knowledge. But in public schools it is still a distant reality" (Interviewee B, 2024).

Therefore, it was unanimous among the interviewees that the benefits of digital games in Physical Education classes are mutual and increase the participation and engagement of students in the proposed activities and help in the teaching-learning process, as can be seen in the figure below (Figure 1).

Figure 1. Data on student engagement and the teaching-learning process with the use of digital games.



Source: Prepared by the author (2024).

The incorporation of technologies in education can have a positive impact, as long as it is innovative with a defined purpose and in a well-structured way, in order to allow the participation and contribution of all in the teaching-learning process. According to Tolomei (2017), the introduction of gamification elements can stimulate active involvement on the part of students. However, for this to occur, it is necessary for educators to reformulate their pedagogical practices, expanding their teaching approaches.

An interesting observation is the disparity in motor development between children from rural and urban areas. Rural children, who generally have limited access to the internet and spend more time engaged in physical activities, demonstrate more robust motor development compared to their urban peers, who tend to spend more time exposed

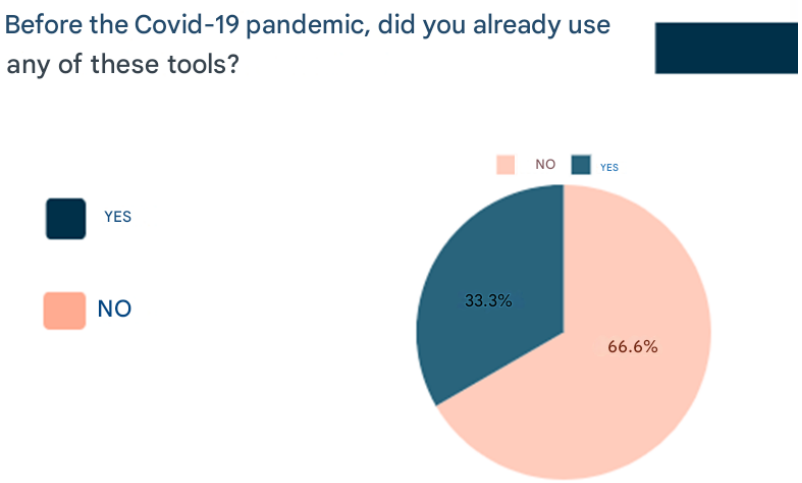
to digital screens. According to a study conducted by McCrorie et al. (2020), there is a significant difference in physical activity levels and sedentary behavior between children living in urban and rural areas. On average, rural children are less sedentary by about 14 minutes and spend approximately 13 minutes more on light-intensity activities per day compared to children living in urban settlements.

The research of Karkera et al. (2013), identified disparities in physical fitness between urban and rural children. Children living in rural areas demonstrate better performance on tests of cardiovascular flexibility and endurance compared to their urban counterparts. Regarding the influence of electronic devices on children's routines, Silva and Santos (2017) observe that parents have increasingly resorted to tools such as smartphones, television, tablets, and video games as a means to control their children's behavior and manage situations according to their convenience, often excluding children from social interactions and keeping them focused on screens.

Another very important context to be discussed is the pandemic period. The COVID-19 pandemic was a watershed in education, forcing the academic community to quickly adapt to technological tools to enable remote teaching. Presenting data from the Organization for Economic Cooperation and Development (OECD), they state that "most teachers did not have access to adequate training to work with digital technologies." They also state that "in Brazil, teacher training curricula do not involve even 1% of their total workload for the technological training of teachers" (Arruda; Gomes, 2021, p. 1742).

Although the COVID-19 pandemic has provided significant advances in this regard, the lack of adequate continuing education and the subsequent abandonment of technological practices after the end of the pandemic highlight a gap in the sustainable integration of these tools into the educational environment. A possible result of this use of technology can be seen in the figure below (Figure 2).

Figure 2 - Use of digital tools.

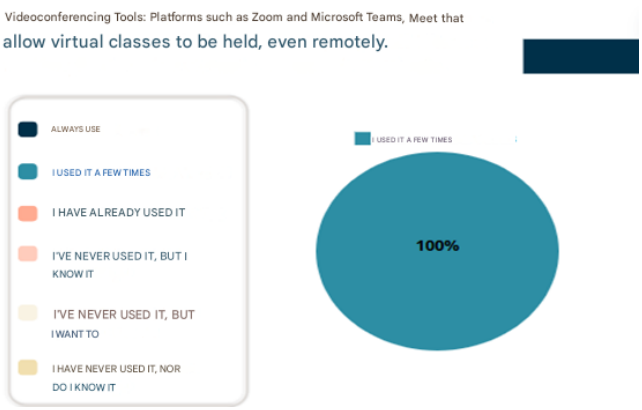


Source: Prepared by the author (2024).

In the observed reality, in relation to the use of digital tools, the *Google Forms, Google Meet, and Classroom,* that started to be used during the pandemic and demonstrated improvements in student participation and class dynamics. However, the limitation of access to these tools, especially after the return to face-to-face classes, where only the use of *WhatsApp* prevails as a didactic tool explored in class.

This fact reveals the dependence on adequate technological infrastructure, as reported that the means of using digital tools are almost never available in educational institutions, whether it is a defective TV, or the lack of a Data Show, through it, the student absorbs knowledge through all the senses, receiving several stimuli for reflection and understanding of the content taught during classes (Masseto, 2010). When analyzing the answers to the questionnaire, which are in agreement with the reports found in the literature and with the observations exposed in the interviews, an illustration of the use of this potential can be seen in the figure below (Figure 3).

Figure 3 - Videoconferencing tools.

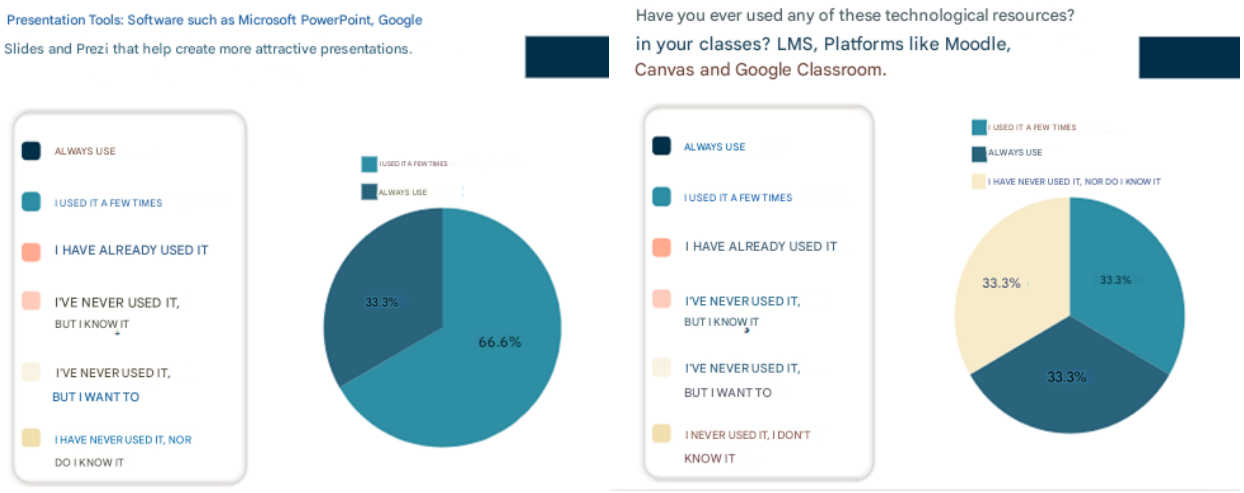


Source: Prepared by the author (2024).

According to a study conducted by Modra, Domokos, and Petracovschi (2021), the use of digital learning tools by teachers aims to improve students' cognitive, emotional, and behavioral engagement during the teaching process. In addition, the digital technologies employed in Physical Education classes have the potential to improve students' motor skills, learning capacity, and motivation.

The motivation of students to get involved in learning with the help of technologies is notorious, since it favors independence and the incorporation of the teaching-learning process in the daily lives of students, with a more active role, the student seeks solutions to their needs and promotes an effective exchange of information in the classroom. The teacher, in turn, is no longer configured as the sole source of knowledge, playing the role of mediator (Peixoto, 2016). A visual representation of the investigated scenario can be found in the figure below (Figure 4), where a graph reveals the lack of use of modern technological software.

Figure 4 - Presentation platforms and tools.

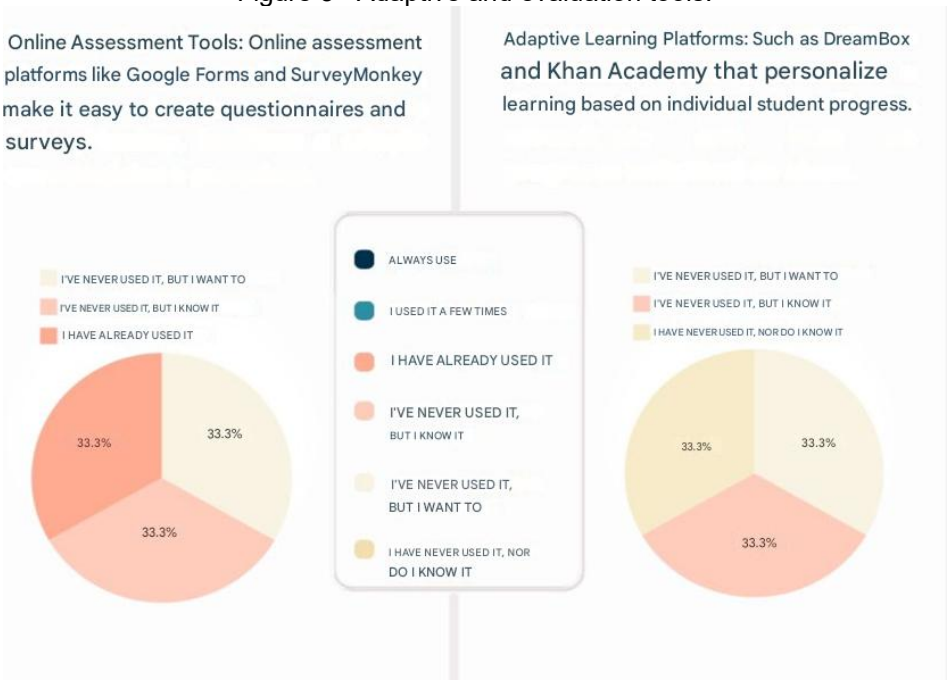


Source: Prepared by the author (2024).

The ban on the use of cell phones in schools in Gurjão reflects an attempt to mitigate the negative effects of excessive use of mobile devices. However, this reinforces the idea for students that the cell phone is a mere entertainment mechanism and cannot be used as an educational apparatus. Educators should consider students' everyday activities involving cell phone use. Instead of rejecting them, they should face the challenge of integrating this device into the teaching process, aiming to attract the attention of students and promote a more playful approach.

According to Monteiro, Teixeira (2007) "what can be said is that the cell phone has been dialoguing with the cultures that are possibly already present in the classrooms and/or in the school space with a disposition that can enable the emergence of new cultures and new pedagogical practices". A demonstration of the setbacks caused by the ban on the use of cell phones in schools in Gurjão can be found in the figure below (Figure 5), where a graph reveals the limited adoption of digital assessment or adapted learning tools.

Figure 5 - Adaptive and evaluation tools.

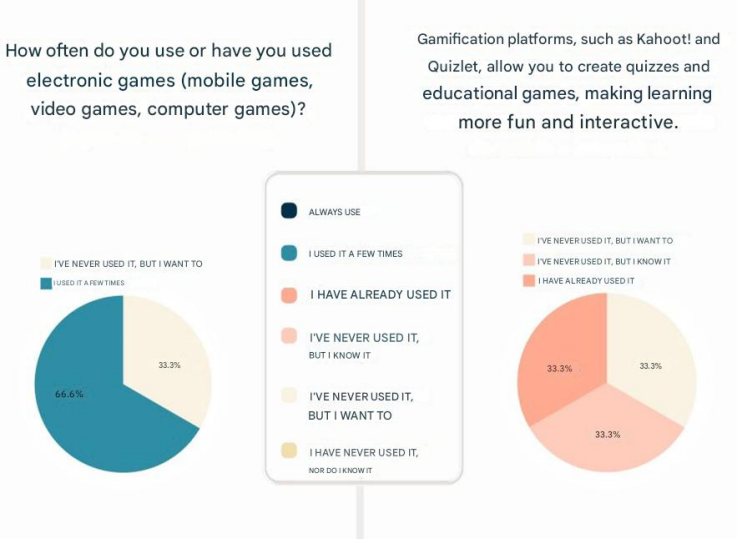


Source: Prepared by the author (2024).

Adherence to gamification is observed as a rarity, as we can see in the graph below (Figure 6), indicating a significant gap between the potentialities offered by these innovative approaches and their effective implementation in classrooms. This finding highlights the urgent need to explore and promote more dynamic and technologically integrated strategies to enrich the teaching-learning process and enhance student engagement.

Electronic games represent an excellent opportunity for teachers to address various topics in the classroom, such as media, internet, video games and how to use these tools to improve their pedagogical practices. Including this knowledge in the BNCC is an important advance, especially considering the evolving profiles of students (Callai *et al. (*2019).

Figure 6 - Use of electronic games and gamification.



Source: Prepared by the author (2024).

According to Bock (2010, p.10), "criticized for the disturbances caused in the educational environment, the cell phone is on the verge of becoming a collaborator in the teaching process, according to a survey carried out by a group of international scholars". It is notorious that the lack of investment in educational infrastructure, including internet access and adequate audiovisual equipment, in schools limits the effectiveness of this measure and compromises the integration of digital technologies in the educational process.

Despite the difficulties faced, the use of emerging educational software shows promise to engage students and enrich the learning environment. However, the scarcity of information in the literature about these tools highlights the need for continuous investments in training and scientific research to leverage and develop more and more information and continuing education for teachers. The teacher assumes the role of mediator of knowledge, promoting a transition from the model of mere knowledge transfer. The student engages in more dynamic learning processes, in which he is the protagonist in the search for knowledge, while education is configured as an agent of personal liberation (Santos, 2010).

Despite the incessant search for as much information as possible, the study finds some limitations, especially with regard to the sample that was restricted to Physical Education graduates who teach in public schools in Gurjão-PB, summarizing the study in only 3 Physical Education teachers, since the city is a municipality with 3,242 inhabitants (IBGE, 2024), thus making it impossible for other professionals in the field of physical education and students from other locations who could provide complementary perspectives. One suggestion for future research would be to broaden the sample to

include professionals from other education-related fields, as well as students from different geographic regions, in order to gain a more comprehensive view of the issues addressed.

In addition, although the methodology adopted in this study integrated quantitative and qualitative approaches, the depth of the qualitative analysis may not have been as comprehensive due to the sample size and the nature of the interviews conducted. One suggestion for future research would be to conduct longitudinal studies that allow for more in-depth analysis of changes over time, as well as explore other qualitative methodologies, such as case studies or focus groups, to capture a wider variety of participants' experiences and perceptions. While this study has provided valuable results on the use of digital tools in physical education, there is room for future research that further explores these issues by considering a more comprehensive and in-depth approach.

The effective integration of digital technologies in education requires a joint effort of teachers, educational institutions and governments, as the discrepancy between the immersion, attendance and collaboration of students in traditional classes (without the use of digital tools) compared to classes using technological mechanisms is immense, in order to overcome infrastructural challenges, promote continuing education and explore the potential of these digital tools to improve the quality of teaching and learning.

CONCLUSION

From the survey, we observed unanimity among the interviewees regarding the benefits of technological resources in Physical Education classes, demonstrating a significant increase in student participation and engagement. A worrying disparity in motor development was also identified between children from urban and rural areas, highlighting the influence of access to technology and time dedicated to physical activities on the integral development of young people.

The COVID-19 pandemic accelerated the adoption of technological tools in education, but revealed deficiencies in teacher training and educational infrastructure, highlighting the urgent need for investments in this regard. Although significant advances have been identified during this period, after the return to face-to-face classes, they highlight a gap in the sustainable integration of digital technologies in education.

The ban on cell phone use in schools reflects a simplistic approach to mitigating the negative effects of excessive use of mobile devices, ignoring the educational potential of these devices. Educators must adopt a more inclusive stance, seeking to integrate the cell phone into the teaching process in a constructive way, recognizing it as a tool that can enrich the educational experience of students. Despite the challenges faced, the use of

emerging educational software shows promise to engage students and enrich the learning environment. However, it is essential to invest in teacher training and scientific research to fully exploit the potential of these tools.

We can observe that education in Gurjão-PB faces several difficulties, whether in terms of infrastructure, materials or adequate professionalization, because of this, the traditionalist teaching model persists and digital technologies are rarely used as didactic tools, confirming the research hypothesis. The education of the future depends on the ability to adapt to the demands of the digital world, ensuring that students are prepared to face the challenges and take advantage of the opportunities that arise in this ever-evolving landscape.

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