

CHALLENGES FACED IN THE INTEGRATION OF TECHNOLOGY IN PUBLIC EDUCATION

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ABSTRACT

This scientific article discusses the main barriers imposed on education in the current context, regarding the integration of technology in educational environments, with a focus on public policies. It also highlights the profile of 21st-century students in relation to this scenario. Based on the literature reviewed in this study, it emphasizes what has been termed by Prensky as the "digital native," characterized by interactive processes and, therefore, constituting a new cyberculture. This gives rise to a renewed demand in this educational context, as it is crucial to consider innovative pedagogical practices in the face of new technologies. Additionally, the use of ICT (Information and Communication Technologies) in the classroom is becoming increasingly tangible and real. As the results outlined in this study indicate, technology offers greater motivation and results during class sessions, which can be considered an attractive advantage to encourage studying.

Keywords: public policies; digital native; educational technology.

INTRODUCTION

Currently, we are experiencing a cultural era marked by digital culture, or cyberculture. In this sense, many of our students spend a significant part of their childhood in educational institutions. In these environments, therefore, there is a constant confrontation with challenges arising from various situations and groups, encompassing political, cultural, psychological, and other aspects. However, in the present times, one of the major challenges that schools face can be observed due to the integration of new information and communication technologies (ICTs) in their educational processes.

In addressing this premise regarding the complex educational process, various reflections can be made. In this regard, the school, for example, can be analyzed to highlight the importance of managing the integration of the school community and ICTs. Furthermore, one can reflect on the teachers and

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the challenge of educating in contemporary times, as well as contemplate the need for continuous professional development and the weariness caused by the lack of recognition for their work. Additionally, the student, despite being immersed in the Digital Age, faces resistance when it comes to integrating ICTs into the teaching and learning process due to the teachers' difficulties in incorporating new technologies. This emphasizes the importance of understanding theoretical concepts related to cyberculture. As Santaella (2004) points out, conceptually, culture allows for human adaptation to the natural environment and its gradual and variable manifestation in institutions, thought patterns, and material objects.

As digital culture encompasses the study of various social phenomena related to digital technologies, including the internet and other networked communication means. In this perspective, Santaella (2004) and Manovich (2005) propose that each individual becomes a producer, composer, creator, and disseminator of their own products. In this sense, hypermedia, known as a product of cyberculture, utilizes the computer to store, retrieve, and distribute information in the form of images, texts, animations, sounds, videos, and virtual worlds (SANTAELLA, 2004).

Based on these theoretical premises, it is worth noting that the objective of this article is centered around understanding the digital profile of students and the public policies aimed at integrating technology in schools. As a result, several recent studies have reflected on the integration of technological devices, such as tablets, in educational environments. These analyses encompass aspects ranging from teacher professional development to public policies and the teaching and learning processes.

According to Lopes and Schlemmer (2012), the movement of emission, production, and connection results in a process of increasing reorganization of social relations fostered by digital technologies, touching, in some way, all sectors of human action in a movement that reconfigures practices and institutions. It is within this context of digital culture that a large part of the

individuals who are part of the educational context is situated. In order to characterize this generation that is growing up with digital technological advancements, researchers use different nomenclatures with the purpose of describing it in detail.

According to SHLEMMER and LOPES (2012), Topscott, as early as 1999, characterized this generation as the "Net Generation," referring to the first evidence of a generation that has been immersed in all digital technologies since birth. For them, technology does not represent threats because it is perceived as a naturally integrated factor in the experiences of these individuals.

21ST-CENTURY STUDENTS AND TECHNOLOGY

The understanding sought regarding the psychocultural and social characteristics of individuals that unify the educational relationship is essential for the success of the teaching and learning process. This is corroborated by the abundance of studies and different concepts surrounding the differentiation and understanding involved in different generations.

In this sense, it is worth highlighting the classification presented by Presnky (2010), which characterizes individuals who were born into the social context that is considered digital in today's world as digital natives, and those who belong to the generation that was born prior to the consolidation of digital culture as digital immigrants.

Thus, it is important to reinforce what Santaella (2004) points out when organizing three categories based on the user's interaction in cyberspace, also known as the contemplative reader, the moving reader, and the immersive reader. The contemplative or meditative reader is classified by her as someone who devotes their time to reading printed books. The second category identified by the author is the moving or fragmented reader, characterized by those born during the peak of the Industrial Revolution, the era of newspapers, cinema, and television. The last category, as described by the

author, is the immersive or virtual reader, representing the user immersed in the Digital Age.

Therefore, it is worth emphasizing the author's postulates and categorization in this regard, as, according to her:

The defining characteristic of the immersive reader lies undoubtedly in interactivity [...]. Another identifying trait of the immersive reader lies in the sensory, perceptual, and cognitive transformations that emerge in this type of reading. In cyberspace, information travels at the speed of light. Motor, perceptual, and mental reactions are accompanied by a change of pace that is visible in the agility of multidirectional movements, zigzagging horizontally, vertically, and diagonally as the gaze continuously scans the screen. It is also evident in the multi-active movement of the mouse pointer and the speed at which navigation is executed (SANTAELLA, 2004, p. 181).

For this reason, it is also necessary to analyze the potentialities that technology can help develop in the classroom when it comes to 21st-century students. Therefore, it is important to consider the school as a space where technology is integrated into every corner that can be related to the teaching and learning process.

Under this perspective, educational institutions are adapting to the challenges imposed by the technological reality, "whether it is to fulfill their social function and disseminate historically constituted knowledge, or to meet the need to become contemporary in the face of scientific and technological advancements" (SOUSA NETO, TRINDADE, 2014, p.3). Students are becoming more demanding and, as a result, no longer accept classes that are considered simple, where the teacher speaks and they simply listen. According to Ramos (2012, p. 5), in this sense, "a new format of education emerges, in which chalk, blackboard, and books are no longer the only teaching tools that teachers possess."

In this logic, let us highlight the thoughts of Pereira and Silva (2013) who, in this regard, add that:

Today it is impossible to talk about education without acknowledging the presence of technology within it. Many schools already offer computer classes not only in primary education but also starting from early childhood education. We know that children are increasingly adept at learning technology, and the computer has become a tool they use for both leisure activities (games, chatting) and learning purposes (research, typing) as well (PEREIRA; SILVA, 2013, p. 5).

Thus, the use of technology can also be seen as a convenient ally for teaching, provided that the school, as a formative environment, can offer all students unrestricted access and utilization of all the benefits that technology can provide.

In this aspect, it can be said that the use of technology in the classroom enhances students' motivation and, moreover, sparks a desire to innovate in teaching practice. Teachers perceive the students' interest in interactive classes that evoke different sensations from what they are accustomed to. However, what should not happen is the teacher using technology and remaining the sole protagonist in the classroom. For example, the use of text projection should not be limited to the teacher reading and providing commentary. It should instead stimulate students' desire to read, encourage them to get up from their seats, highlight specific vocabulary on the board, or even write their ideas in connection with the reference text for that lesson.

In this context, "interaction" refers to the mutual influence of organs or organisms that interact with each other, i.e., the mutual or shared action between two or more bodies or individuals, a communication that exists among people who coexist: dialogue, interaction, contact. An interactive class without the students' interaction does not happen. As long as the students remain in their seats, without movement and without exchanging knowledge, the classes will not be appealing to their eyes, and the use of technology will not yield satisfactory results.

According to Behrens and Santos (2011):

Innovative teaching action needs to encompass the utilization of various available resources, especially computers and information networks. Both teachers and students must engage in a collaborative

process to learn in a creative, dynamic, and encouraging manner, with dialogue and discovery at its core. [...] Teachers and students become supportive partners who confront challenges based on real-world issues in contemporary society, demanding joint actions that foster collaboration, cooperation, and creativity to make learning collaborative, critical, and transformative. (BEHRENS and SANTOS, 2011, p. 76)

Due to issues like these, it is important to highlight the need for teachers to perceive the broad scope of technology in today's world. The possibilities are numerous, and even with limited or abundant technological infrastructure, it is undeniable that with minimal access to available digital media, it is already possible to develop innovative and differentiated lessons. Furthermore, students' mobile devices should be utilized, along with projectors that allow for various modes of usage. The key to the success of these classes is the utilization of any technological tool in a way that both the student and the teacher can actively participate throughout the lesson. It is about encouraging the student to speak, write, comment, create, and intervene in the educational process as the protagonist of their own knowledge construction.

In summary, the use of technology should be carried out with "interaction" and not merely as a mere reproduction of content. A technology-infused class should be planned in advance because students can discern when the teacher has genuinely prepared a good lesson with technological tools.

PUBLIC POLICIES FOR DIGITAL INCLUSION

The Federal Government of Brazil has been encouraging digital inclusion and the use of technology in the field of education through government programs. However, according to the 2016 Census, only 68.2% of enrolled students have access to computer labs in their schools. Therefore, it is crucial to highlight that educational technologies are unfortunately not available to all students and teachers. When we compare these data with the digitized society in which we are immersed, we can classify them as unsatisfactory. We can also identify the disparate realities that hinder the use

of technology as alternative pedagogical tools in the classroom. However, from another perspective, Almeida (2011) points out that:

Technologies began to enter educational spaces brought by the hands of students or through their way of thinking and acting as representatives of the digital native generation. They became part of the culture, occupying a place in social practices, reshaping educational relationships even if they are not always physically present in educational institutions. Among the typical technological artifacts of the current digital culture, with which students interact even outside of school spaces, are electronic games that stimulate immersion in the visual aesthetics of digital culture. There are also characteristic Web 2.0 tools, such as social media presented in different interfaces, and mobile devices such as cell phones and portable computers that allow access to virtual environments in different spaces and times, among others (ALMEIDA, 2011, p. 5).

For these reasons, Quaresma (2015) states that despite Computer Science having developed technologies that enable technological inclusion in the classroom, education suffers because it has not kept up with technological advancements.

In addition to that, it is important to emphasize the need for the use of technology as a pedagogical tool in the classroom and how it should be based on well-founded and carefully planned pedagogical proposals, supported by concepts that enable the application of innovative technologies to enhance the teaching and learning process, making the class more dynamic, contextualized with students' reality, interactive, and dynamic. Therefore, implementing technological tools in educational spaces requires not only technological changes but also paradigm shifts and changes in teachers' conceptions of how learning, interaction, and knowledge construction occur.

In this perspective, it is important to reflect on alternative possible paths that allow for the enhancement of the knowledge construction process based on theoretical frameworks that promote reflection on knowledge construction mediated by the use of technological tools in the classroom. Specifically, these paths should aim to meet the needs of students who are present in today's educational context.

FINAL CONSIDERATIONS

Based on the bibliographic studies listed in this research, we can affirm that technology offers greater motivation and results during class sessions, which can be considered an attractive and advantageous aspect to encourage studying. From a philosophical perspective, influenced by Plato, it is recognized that necessity has become the mother of interventions that occur in modern times. In comparison to this, it is crucial to emphasize the need to promote the integration of technological resources aimed at assisting learning, and the school, in turn, should keep track of the progress of these classes, both from the teachers' perspective and the demonstrated learning progress of the students. Thus, this research makes it clear that modern technological tools are indispensable for the formation of individuals with a broad range of knowledge in all areas.

We live in a reality where we can no longer ignore technology and its benefits, especially in the realm of education. It is inherent in the innovative context and constantly evolving to enhance teaching in the classroom. The role of schools is to improve their structures considering the physical and financial conditions of educational institutions. With the minimum possible resources available for these experiences, it is necessary to empower education professionals and provide their students with enjoyable and interesting learning experiences in the classroom. By offering lessons that awaken genuine interest in the subject being taught. It is also important to consider the constant evolution of the world, and therefore, improvements in education cannot be neglected. It is proven that technology in the classroom is a facilitating tool for the teaching and learning process.

Furthermore, another relevant factor in these considerations is the relevance of using this technology as a pedagogical tool in the inclusion of people with disabilities or learning difficulties. Considering the fact that equity and quality in education need to be provided, it is known that by enabling the autonomy of these students in the processes of understanding and relating to

others, education offers new experiences for these individuals, facilitating interaction and understanding of the world of others.

It is evident, therefore, the importance of continued research on the use of technological tools, as long as it prioritizes inclusion and the integration of all audiences present in basic education institutions in every corner of the country. With the aim of achieving quality education for all students and the development of more critical, creative, and socially prepared citizens who can contribute to the construction of a fairer and more supportive world.

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