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The challenge of combining technology with teaching methodology: a look at teacher training

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SUMMARY

The central theme of this study is to highlight the importance of improving technical knowledge. pedagogical practices of teachers in educational institutions, regarding the use of educational technologies and teaching resources. The methodology adopted was descriptive qualitative research, which made it possible to reach the results on how to explore the multiple educational possibilities of these resources on days of today. In this way, we started from the contributions of scientific theories related to this area, observing, thus, the current state of the art of research on the subject, when revisiting or reviewing research and discussions already published on the subject. The main authors used in carrying out this study were Almeida, Jonassen, Costa, Valente, Christensen, among other theorists.
Keywords: Teacher training; Technology; Methodology.

ABSTRACT

The central theme of this study is to highlight the importance of improving the technical-pedagogical knowledge of teachers in educational institutions regarding the use of educational technologies and teaching resources. The methodology adopted was descriptive qualitative research, which made it possible to achieve results on how to explore the multiple educational possibilities of these resources today. Thus, the starting point was the contributions of scientific theories related to this area, thus observing the current state of the art of research on the subject, by revisiting or reviewing research and discussions already published on the subject. The main authors used in carrying out this study were Almeida, Jonassen, Costa, Valente, Christensen, among other theorists.
Keywords: Teacher training; Technology; Methodology.

1- INTRODUCTION

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Living in the current societal context implies constant exposure to a profusion of information made available by different means, which are renewed at a fast pace and which causes unforeseen, immediate and profound changes in society, to the point of being called of information society (COSTA, 2011). In this horizon, according to the author in question, consider that the profile of today's students, “is radically different from the generations previous” (p. 134), from the point of view of their interests and motivations, “it no longer makes sense that the educational process continues to be based on the organization, simplification and transmission of content by the teacher and by the manuals” (p. 121).

From this angle, teachers, in their professional work, need to use appropriately, from a didactic and pedagogical point of view, educational technologies and teaching resources available in abundance today. From this perspective, Miranda (2009) states that quality of education depends fundamentally on a set of variables, all of which are inter-related, such as the quality of content and activities, as well as teaching methods and teaching resources used by teachers, for illustration purposes.

It is important to emphasize that the 21st century teacher has the responsibility to prepare himself for the paradigm shift and adapt (because the world has told it to) to the introduction of new technologies in their pedagogical practice. In this sense, they also have responsibility for their path professional and seek to constantly update oneself, gaining relevance in reflecting on the myriad possibilities that technologies offer to the educational field, making it essential to improvement of teachers' pedagogical knowledge, through initial training and continued, for the use of these teaching resources.

In this path, according to Valente and Almeida (2011), several studies indicate that This process is not simple, it requires time and happens in phases, so it is important that teachers' technical and pedagogical knowledge grow together, simultaneously, and thus, constitute a true upward spiral. This objective will become possible if the formation of teachers take into account that, more than learning how to operate a certain resource technological, it is essential to combine technology with methodology and reject the role of technology as a mere instrument to reinforce the knowledge transmission model.

2- DEVELOPMENT

It is important to initially consider some aspects to reflect on the challenges and opportunities regarding the use of digital technologies in education, in the current post-pandemic context, in terms of innovation of pedagogical practices and improvement of learning. In fact, the teachers are fundamental in this process, and, according to Bacich, Moran and Florentino (2021, p. 1-2),

in the current context they had to reinvent themselves, in the sense of learning new ways of using digital platforms in education, with a view to establishing new connections with students.

In order to scrutinize this process, it is therefore important to carefully select teaching strategies, so that the chosen technological resources can fit into the proposed learning objectives, leading to the effective construction of learning, with problems to be solved collaboratively. According to Illeris (2013) it is worth noting that, in the current complex context, the concept of learning covers a much wider spectrum than which is traditionally understood, including other distinct dimensions beyond mere acquisition of information.

In light of this analytical perspective, from the perspective of Illeris (2013), learning can be understood as the acquisition and apprehension of new knowledge or the complementation and extension of those already existing, being a continuous process, that is, one that occurs throughout life. In view of this, it is necessary for the teacher, to better support his/her practice, to understand the different pedagogical possibilities of technologies, in order to identify those that best contribute to the teaching of their subject, in light of the learning objectives to be achieved and the profile of its students. In this context, having as the ultimate goal of its practice the learning of students, so that

> It is undeniable that today's students are no longer the same as they were just a few years ago. The fact is that society has changed, and education needs to keep up with these broader changes. It is precisely in this context that the need arises for a pedagogical practice based on active education that is increasingly online and hybrid (CAMARGO and DAROS, 2021).

From this perspective, in order to reflect on the use of technologies in the teaching process, according to Coutinho (2006, p. 3), to make the best use of their potential in didactic action, it is important to emphasize that, for Tapscott (2010, p. 141), the increase in technology in education can enhance students' active learning, thus, for this author, digital immersion can stimulate the development of intelligence, incredibly flexible, adaptable and skilled in various digital media, and who acquires planning skills, making choices, practice and discover, in an interactive and challenging way.

In this sense, a point that should be raised, according to Coutinho (2006, p. 2), is the need for reflection on the role of technology in education, given that globalization has led us to such broad connectivity, through massive access to the internet, that we live today in a so-called “networked” society, where access to information is very easy and unlimited, at your fingertips, just a click away. The importance of this reflection is also highlighted by

Vicente and Almeida (2011, p. 43), when they state that the increase in technology in education, on the one hand, it helps to diversify didactic-pedagogical strategies and educational solutions, but, on the other hand, On the other hand, this diversification does not effectively guarantee the process of appropriation of these resources digital by the subjects of educational praxis.

In the particular case of this study, it is worth noting, according to Costa (2011), that the change constant of the teacher's social and professional context translates into the requirement of a methodology different from what was previously required. This change requires adequate monitoring regarding the organization of the teaching-learning process and the working conditions of the teacher. In this way, it is necessary that the initial and continuing training offered to teachers is not out of step with the current context of the information society, but is consistent with the level of preparation required for the adequate use of technologies digital in the classroom, with the aim of promoting significant learning.

In view of the above, the backdrop to this context is revealed, according to Costa (2011), that even after the training period, teachers continue to have difficulty in using technologies to promote student learning. In this regard, Costa (2011), In his studies, he highlights that “equating the future of school and learning today is something that cannot be can be done without considering the influence of digital technologies” (p. 136), thus, teachers need to be prepared to perform their pedagogical functions and reflect on the introduction of new teaching-learning strategies with the adoption of technological resources teaching.

In view of this, it is important to note that digital technologies go beyond this conception. merely instrumental, becoming not just a means of communication, of transmitting a message, but rather to fully live a new social organization, marked, as well Costa (2011) pointed out, due to the intensity of information flows, the speed of processes and social transformations and also the complexity, unpredictability and interdependence in relationships. In this perspective, technologies have changed our way of being and existing in the world, of relate to each other, and therefore they need to have greater prominence in education, acting not only as accessory element to the teaching-learning process.

In this context, Costa (2011) asserts that the preparation of teachers in the use of information and communication technologies (ICT) in their educational practices is not just a a question of being technically prepared, but also of taking ownership of their effectiveness methodological point of view, so, as Coutinho (2006) says, it is in training that the the crux of the matter, “without training teachers will not be able to develop practices quality pedagogical practices based on technologies” (p. 10). Thus, allowing flexibility

of the forms of access to knowledge through digital technologies, conceived as tools of learning and active construction of knowledge, so that its interactive characteristic, It makes it possible to guide and optimize ongoing learning and encourage students' creativity.

Costa (2011), in his studies, proposes a reflection on the integration of technologies in education, as being inescapable the long road that still has to be traveled and, also, on preparing teachers to include digital technologies in their practices pedagogical. The aforementioned author even points out that the training models used are ineffective in preparing teachers to improve student learning. At this point, It is observed that teacher preparation has been improving, especially during and after the pandemic, due to the need to use digital resources that would enable the transmission of content. However, there is still a long way to go and challenges to face in the regarding the digital training/qualification of teachers.

> The training of educators, whether or not they are technologists, today encompasses the technical dimension, the human dimension, the political-economic context and the knowledge to be transmitted, all of which can be summed up in what can be called the acquisition of competence (NISKIER, 2014, p. 30).

Even though many teachers use digital resources in their practice, this attitude does not means that they have an appropriate pedagogical use and, consequently, contribute to student learning. As mentioned by Ramos, Teodoro and Ferreira (2011), digital resources must be innovative resources with pedagogical potential adjusted to the context, because only in this way can they contribute to the student's learning. Therefore, educators, in this context, need to align their teaching methodologies with the appropriate pedagogical use of technologies, which will contribute to the effectiveness of teaching and emancipation of students. In view of this, authors such as Tapscott (2010) point out that technology, when well employed can enhance students' active and meaningful learning, favoring the development of intelligence and different skills and abilities.

It is also worth highlighting that, based on Pereira (1993), it is interesting to observe that, in Nowadays it is urgent that the educational process is increasingly focused on a model of teaching-learning that values the use of different digital technological means and resources, without disregard the specificities of each education system, especially due to the current need to increase interactive technologies in school dynamics, in this post-secondary context pandemic, in contrast to traditional education that does not prioritize the communication model multidirectional, in a dialogical relationship between the different actors participating in the educational process, with the use of technologies.

According to Kenski (2012), in this new paradigm, the student is the subject who becomes present throughout the process of construction and reconstruction of knowledge, a process that experienced in the interactive and collaborative learning environment, mediated by technologies and by the mediating presence of the teacher. According to this argument, this educational model advocates procedural evaluation, monitoring of academic performance accompanied by continuous feedback, when the teacher's concern is to guide the learning process, as a partner, interacting and facilitating the process of exchange and growth.

It can be inferred, therefore, that the student must become creative, critical, researching and active. to produce knowledge, extracting information from various sources. Students build the knowledge through exploration, navigation, communication, exchange, representation of creation recreation, organization reorganization, connection reconnection, transformation elaboration and reworking (ALMEIDA, 2005). From this perspective, students should be encouraged to go beyond the passive role of repeater and “learning to learn” so that they become capable of solving problems with autonomy and creativity (BEHRENS, 2005). In order to build knowledge, in this optics, teaching involves creating learning environments in which the student begins to interact with various problem situations and learning depends on the student's ability to process, interpret and understand the information received and, from there, create solutions for the problems.

Regarding this, Valente (2005, p. 27) states that ICT, especially the internet, presents a of the most efficient resources for searching and accessing information, allows you to develop skills in research and critical evaluation. Following this reflection, Kenski (2012) points out that the approach of learning through digital skills suggests a new educational paradigm, in which the objective The main thing is to promote a link between education and the demands of the digital society contemporary. Regarding this conception, it is worth highlighting the paradigm shift regarding the ICT-mediated learning, as shown in the table below.

Table 1 *Combination between new paradigms and ICT*

Da educação à aprendizagem	
Antigo paradigma	**Novo paradigma**
Instalações físicas (prédios escolares)	Ciberespaço
Freqüência obrigatória e horário rígido	Conveniência de local e hora
Ensinar	Aprender a aprender
Currículo mínimo, disciplinas obrigatórias e pré-requisitos	Conteúdos significativos e flexíveis
Unidisciplinaridade	Inter, multi e transdisciplinares
Pedagogia	Andragogia
Transmissão do conhecimento	Aprendizagem coletiva
Educação formal	Educação não formal
Formação com duração prefixada	Formação ao longo da vida
Educação a distância	Aprendizagem aberta e flexível
Economia de bens e serviços	Economia do conhecimento
Professor	Orientador de aprendizagem
Avaliação quantitativa	Avaliação qualitativa
Diploma/certificado	Satisfação de aprender

Taken from: Formiga (2014, p. 43).

According to the paradigm shift regarding education and learning portrayed in table above, regarding learning mediated by ICT, according to Almeida (2014, p. 105), the current challenges faced by the growing demand for initial and continuing teacher training, which occurs throughout life, they reopened discussions about the new educational possibilities that can lead to learning in this scenario of dissemination of digital technologies. In this way, “the concept of education can be broken down into the ideas of teaching and learning, in which education takes place when a teaching project generates learning” (MAIA and MATTAR, 2007, p. 4).

In view of this, based on Costa (2011, p. 123), it is also relevant to point out that the increase in information available to people and ease of access to this countless amount of information information that digital technologies provide has ended up transforming/modifying the world in which we live, greatly influencing the teaching-learning process. In this way, for the continuous improvement of the educational process, according to Bacich and Moran (2018), the teacher must be well-founded to select the digital tool that best meets the proposal pedagogical approach of the course you teach, which is within the learning approach of your

discipline, and must also use teaching methodologies that more effectively meet the objectives pedagogical.

Kenski (2012) proposes a discussion on this subject, so that the author in question considers that currently the teaching-learning process is no longer centered on the figure of the teacher as the absolute holder of knowledge, in a unidirectional perspective, since the student is an active subject in this process. One of the challenges for teachers in relation to ICT is, in this sense, understand that learning is the center of the process and its role shifts to that of mediator/facilitator of learning. Therefore, it is up to the teacher to recognize that students are heterogeneous, due to the experiences and information they have, their interests, tastes and expectations, difficulties and limitations, etc., so that you can keep your attention, organizing a plan that allows the use of differentiated/personalized resources, which stimulate and instigate students, asking questions and provoking dialogical reactions to facilitate learning (KENSKI, 2012).

From this angle, in line with Camargo and Daros (2021), the different possibilities educational resources revealed by the myriad of technological resources present in society reveal the relevance of working in the classroom with a focus on meaningful and collaborative learning by students, through their effective participation as mediators, where the curricular design of fact can favor their active learning. In this way, the teacher can make didactic use of the multiple creative possibilities of technologies, increasingly hybrid and disruptive, combining digital tools according to the learning objectives, bringing elements close to the significant reality of students (Jonassen, 2007, p. 24), favoring the construction of knowledge by students in an active, dynamic, innovative way.

In this line of understanding, according to Miranda (2007), there are teachers who in fact see the use of digital technologies as accessories, something that adds to activities pedagogical practices already in existence without there being a clear pedagogical intention. Others believe that it is enough that there are computers in the classrooms, some *software* and an internet connection and that this is sufficient for digital technologies to align with the curricular and pedagogical proposal and to the teaching methodology (MIRANDA, 2007). On this subject, Costa (2011, p. 132) highlights the importance of training for an adequate methodological use of digital technologies, to the effective achievement of learning objectives. In light of Costa's (2011)

theoretical contributions, it is necessary to have the integration of technologies in the curriculum, emphasizing the need for teacher preparation in order to include digital technologies in their pedagogical practices, thus helping students to do their research, create texts and share content. The author even mentions that,

sure, there is a certain fear among many teachers even today, of using ICT in their classes. There are, therefore, several improvements to be made, such as the inclusion of teaching on the use of technologies as a mandatory item in teacher training, since they are fundamental for expanding knowledge, and is also necessary to show students how to best use them to expand opportunities. Highlighting teacher training, initial and ongoing, as a touchstone so that they can offer practices and actions that awaken students' interest and promote their development.

Therefore, it is important that the teacher shares with the students the most useful to use the application, and then you can explore the functionalities of this tool to create and build meaningful learning. In which cognitive tools, according to Jonassen (2007), can act as facilitators of learning. It is now necessary to clarify that in these innovative creative activities, according to Zabala and Arnau (2014), seek to promote research and collaborative learning, in which students, individually or in small groups, must explore and develop their knowledge, in an attempt to resolve challenges and situations-problem proposals, encouraging the development of skills.

Ponte (2014) considers that technology supports effective teaching and its appropriate use depends on the teacher, who must consider that technology alone is not a panacea, a universal solution that will cure all the ills of education in the present time. How can one understand, from this interpretation key, how any teaching tool can be used adequately or deficiently and teachers should use it for the purpose of improving learning opportunities for your students, as already mentioned, by selecting or creating tasks that take advantage of what technology can do well and efficiently.

It is worth noting that, according to Valente and Almeida (2011, pp. 48-49), the teacher must seek to integrate their knowledge and that which students bring from their daily lives when exploring the functionalities of interactive technologies. Thus, helping students to better organize their knowledge and express the result of their learning (Jonassen, 2007, p. 24), with the possibility of monitoring the creative work of students during their journey learning. In this sphere, according to Christensen (2012), it is also necessary to competence to choose the most appropriate methodology and technique to use, explore the functionalities of digital tools, proposing and applying improvements.

3- FINAL CONSIDERATIONS

Considering the issues raised, it is imperative to agree with Jonassen (2007), when states that innovating pedagogical practice is to favor autonomy, learning to learn, thinking

about learning itself, above all, through the appropriate choice and use of methodologies and teaching resources that are, in fact, innovative. Thus, according to Valente and Almeida (2011, p. 48-49), as the technical and pedagogical domain of educational practice should not be watertight, that is, separate, the teacher must seek to integrate his knowledge and those who students bring from their daily lives when exploring the functionalities of interactive technologies, during the approach of the contents.

In general terms, it is worth highlighting that the rapid development of technologies and the difficulty in finding time for the teacher to appropriate ICT creates a problem. Indeed, the Things have changed so quickly that teachers are at a huge technological lag, in which we must understand that the pandemic brought about a necessary situation, which was previously only in future plans of the teaching class. Given that, as Costa (2011) rightly mentions, the school of Today, as in the past, it is resistant to innovation, creating a certain passive resistance to adhere to the increase in technologies, remaining at the forefront of this innovation process, the which invariably has consequences for teaching.

In summary, it is worth highlighting that students, when working collectively in a true learning community could perceive, in a critical and constructive way, the usefulness of these cognitive tools and then seek to align them with their learning. In these activities student participation and involvement are required when interrelating their knowledge, raise their hypotheses and interpret the context in a critical and reflective way (Jonassen, 2007, p. 25), hence the importance of collective discussion, as well as joint reflection and dialogued, about the advantages of using educational technologies aligned with the methodology teaching methods of teachers in the classroom.

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