DIGITAL TECHNOLOGY AND EDUCATION: mapping productions in scientific journals

TECNOLOGIA DIGITAL E EDUCAÇÃO: mapeamento de produções em revistas científicas

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ABSTRACT

This study aimed to map the productions on technologies and education in scientific journals, from 2006 to 2019. The methodological path that composed the results found, from the most cited texts in Google Scholar of journals Tempos e Espaços em Educação, Espaço Pedagógico e Tear: Revista de Educação, Ciência e Tecnologia,was guided by the systematic review, which is a type of research that follows specific standards and aims to give logic to a wide documentary corpus. In this sense, applied the exclusion/inclusion criteria it was found that the studies with greater notoriety are concentrated in the areas of teacher training and practice from the use of technologies, in addition to inclusion and digital culture. Through the mapping, it was possible to perceive the significant increase in productions on digital technologies in the investigated journals, contributing to the improvement of professionals and researchers who make investigations in this area of knowledge and, in addition, express the relevance of technologies and their varied possibilities of use in the educational field. Despite technological advances, access to the network, lack of resources and failures in teacher training for the use of digital, there are still some obstacles that interfere in the integration of digital technologies in education.

Keywords: Literature review. Scientific production. Education. Digital Technologies.

RESUMO

Este estudo teve por objetivo mapear as produções sobre tecnologias e educação em revistas científicas, no período de 2006 a 2019. O caminho metodológico que compôs os resultados encontrados, a partir dos textos mais citados no Google Scholar das revistas Tempos e Espaços em Educação, Espaço Pedagógico e Tear: Revista de Educação, Ciência e Tecnologia, foi tema de pauta na revisão sistematizada, que é um tipo de pesquisa que segue padrões específicos e almeja dar sensatez a um amplo corpus documental. Neste sentido, aplicado os critérios de exclusão/inclusão verificou-se que os estudos com maior notoriedade se concentram nas áreas de formação e prática docente a partir da utilização das tecnologias, além da inclusão e cultura digital. Por meio do mapeamento, foi possível perceber o aumento significativo das produções sobre tecnologias digitais nos periódicos investigados contribuindo para o aperfeiçoamento de profissionais e pesquisadores que tecem investigações na referida área do conhecimento, assim como expressam a relevância das tecnologias e suas variadas possibilidades de utilização no campo educacional. Apesar dos avanços tecnológicos, o acesso à rede, a carência de recursos e a falhas na formação docente para o uso do digital ainda são alguns entraves que interferem na integração das tecnologias digitais na educação.

Palavras-chave: Revisão de Literatura. Produção Científica. Educação. Tecnologia Digital.

1 Introduction

Technology has revolutionized the human condition in all aspects, whether economic, social, political or cultural, also influencing education. As of web 2.0, the internet allows the interaction and sharing of information on the network, new features have been used in cyberspace, going beyond entertainment (Santos et al., 2020).

The advances also contribute to scientific production, when considering the variety of themes and applications of technologies in the educational field. From this, this study aimed to map the productions on educational technologies in periodicals registered in the Google Scholar database. It is a bibliographic study, built from a systematic review of the literature.

This type of review is configured as an indispensable instrument in the preparation of academic works, helping to insert scientific production in the large area of research in which it is a part. From the evidence, the results are collected, categorized, analyzed and synthesized (Rios et al., 2020).

The selection process of articles took place from the productions with the highest citation index, in academic studies published in the following journals: Revista Tempos e Espaços em Educação, from the Graduate Program in Education (PPGED) of the Federal University of Sergipe (UFS), Revista Espaço Pedagógico, from the Graduate Program in Education (PPGEDU) of the University of Passo Fundo (UPF), and Tear: Education, Science and Technology Magazine, from the Federal Institute of Education, Science and Technology of Rio Grande do Sul (IFRS).

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In the first part of the study, the most cited articles that fit the field of educational technologies are presented, which in turn were organized according to the number of citations. In a second step, we carry out the categorization of the productions trying to understand which are the most recurrent categories

in the studies, besides the brief description about each production.

2 Systematic review track

Systematic review is a method used to evaluate a set of data from different studies. It seeks to collect all empirical evidence that fits pre-defined eligibility criteria, in order to answer a specific question. It uses systematic methods that are selected with the aim of minimizing bias, thus providing more reliable results, with which conclusions can be made and decisions made.

> The systematic review differs from the traditional one, since it transcends probable biases in all stages, covering a rigid search and research selection methodology, analyzing the legitimacy of what was found and collecting, synthesizing and interpreting the data from the investigations (Rios et al., 2020, P. 336).

The steps in conducting a systematic review are similar to those of any other research project: it involves formulating the problem, collecting and analyzing data and interpreting the results. Likewise, a detailed study protocol, indicating the objectives, the subgroups of interest, the methods and criteria to be used for the identification and selection of the relevant studies, extraction and analysis of the data, must precede the preparation of the review. The importance of this is in preventing decisions from being influenced by the data collected. Subsequent changes to the protocol must be specified and justified.

In the area of Education, the systematic literature review stands out for numerous contributions, among them: "the concentration of results from several other studies in the same work, increasing reliability and revealing the status of a research problem" (Dias et al., 2015, p. 196).

Thus, with a view to delimiting the productions to be compiled, it is essential that we define exclusion/inclusion procedures. In this sense, with regard to these procedures, we opted for journals that were indexed in the base Web of Science, categorized in the large area of humanities and in the area of Education and that presented at least five productions among the most cited in Google Scholar, on the theme technologies aimed at education. In this sense, after having performed these procedures, we found three

journals: Revista Tempos e Espaços em Educação, from the Graduate Program in Education (PPGED) of the Federal University of Sergipe (UFS), Revista Espaço Pedagógico, from the Graduate Program in Education (PPGEDU) of the University of Passo Fundo (UPF), and Tear: Magazine of Education, Science and Technology, of the Federal Institute of Education, Science and Technology of Rio Grande do Sul (IFRS).

It is worth mentioning that, because the number of citations may vary and thereby change the order of the texts more or less cited in these journals, the selection of these productions took place on July 28, 2020.

With regard to the most cited articles in each of these journals, on the theme of technology and education, it should be noted that in the Tempos e Espaços em Educação magazine, the tenth most cited article had the same number of citations as the eleventh and twelfth, making up a total of 12 articles. In the Espaço Pedagógico magazine, there were 9 articles, while in the journal Tear: Revista de Educação, Ciência e Tecnologia, 8 articles. Thus, the total number of articles, applying all the criteria described here, was 29 articles.

3 Most cited articles on Google Scholar: the expansion of technology and education research

The most cited articles were published between the years 2006 to 2019. Revista Espaço Pedagógico has the highest number of citations, being 849, obtaining indexes h equal to age and i10 twenty-four. Then the Tempos e Espaços em Educação magazine with 820 citations, with an h index equal to fourteen and i10 twenty-one, while Tear: Revista de Educação, Ciência e Tecnologia appears with 203 citations, obtaining a hygiene index of six and i10 four.

We emphasize that the h index represents the h productions that have at least h citations over the past 5 years, while the i10 index refers to the number of publications with at least 10 citations in the last 5 years. Table 1 shows the productions in ascending order according to the number of citations in Google Scholar.

Board 1: Magazines for numbers of quoting

Título	Nº de citação	Autor(es)	Periódico
A aprendizagem ubíqua na educação aberta	34	Santaella (2014)	Revista Tempos e Espaços em Educação
O uso de dispositivos móveis no contexto educativo: análise de teses e dissertações nacionais	17	Almeida & Araújo Jr. (2013)	Revista Tempos e Espaços em Educação
Ambientes educativos inovadores: o estudo do fator espaço nas 'salas de aula do futuro' portuguesas	12	Pedro (2017)	Revista Tempos e Espaços em Educação
Desafios e oportunidades do uso da tecnologia para a formação contínua de professores: uma revisão em torno do *tpack* em Portugal, Brasil e Espanha	12	Nogueira & Gallego (2015)	Revista de Educação, Ciência e Tecnologia
Utilização de jogos digitais para o desenvolvimento do raciocínio lógico-matemático	12	Silveira et al., (2012)	Revista de Educação, Ciência e Tecnologia
Práticas pedagógicas com a web 2.0 no ensino fundamental	10	Bassani et al., (2013)	Revista Espaço Pedagógico
Culturas digitais na educação do Século XXI	9	Lucena & Oliveira (2014)	Revista Tempos e Espaços em Educação
Hacking education. A formação entre a abertura e a tecnologia	9	Pireddu (2013)	Revista Espaço Pedagógico
A cultura digital na formação de professores	8	Souza & Bonilla (2014)	Revista Tempos e Espaços em Educação

A singularidade na multiplicidade: crianças e tecnologias móveis na escola no contexto da cultura digital	7	Miranda & Fantin (2015)	Revista Tempos e Espaços em Educação
Produção de vídeos em sala de aula: Uma proposta de uso pedagógico de celulares e câmeras digitais	7	Almeida (2013)	Revista de Educação, Ciência e Tecnologia
As crianças e o repertório lúdico contemporâneo: entre as brincadeiras tradicionais e os jogos eletrônicos	7	Fantin (2006)	Revista Espaço Pedagógico
O letramento digital no processo de formação de professores de línguas	5	Marzari & Leffa (2013)	Revista de Educação, Ciência e Tecnologia
Os jovens na contemporaneidade: a experiência da articulação entre a dinâmica da escola e um projeto de inclusão digital	5	Souza & Bonilla (2012)	Revista Espaço Pedagógico
O ensino da matemática em meio à tecnologia: desafio aos programas de formação de professores	4	Purificação & Pessoa (2015)	Revista de Educação, Ciência e Tecnologia
Mapeamento de jogos educacionais	4	Santos et al., (2013)	Revista Espaço Pedagógico
Educação a Distância, TIC e formação de professores de pedagogia: um estudo de caso a partir da mídia-educação	3	Souza & Borges (2018)	Revista Tempos e Espaços em Educação
Cinema e educação para além do conteúdo	3	Linhares & Avila (2017)	Revista Tempos e Espaços em Educação
Letramento digital de idoso no contexto da EJA em Mossoró-RN	3	Lima & Almeida (2015)	Revista de Educação, Ciência e Tecnologia
A Educação a Distância como auxílio na formação de professores	3	A Ponticelli et al., (2013)	Revista de Educação, Ciência e Tecnologia
Uso de blogs no processo de aprendizagem de literatura no ensino médio	3	Porto & Porto (2012)	Revista de Educação, Ciência e Tecnologia
Pensamiento computacional: una nueva exigencia para la educación del siglo XXI	2	Valencia & Panaqué (2019)	Revista Espaço Pedagógico
A Programação de jogos como um instrumento motivador da aprendizagem	2	Pinto & Matos (2019)	Revista Espaço Pedagógico
Ensino de história por meio de jogos digitais: Relato de aprendizagem significativa com games	2	Bianchessi & Mendes (2019)	Revista Tempos e Espaços em Educação
Aplicativos móveis para a alfabetização e letramento no contexto do ensino fundamental	2	Junior et al., (2018)	Revista Tempos e Espaços em Educação
Formação Continuada em contexto híbrido e multimodal: ressignificando práticas pedagógicas por meio de projetos de aprendizagem gamificados	2	Bersch & Schlemmer (2018)	Revista Tempos e Espaços em Educação
Utilização das TIC no ensino de Português: o olhar revelador dos professores	2	Neto (2012)	Revista Tempos e Espaços em Educação
Ensino de programação em robótica com Arduino para alunos do ensino fundamental: relato de experiência	1	De medeiros & Wünsch (2019)	Revista Espaço Pedagógico
Um computador por aluno: possibilidades de inclusão e letramento digital	1	Flores (2013)	Revista Espaço Pedagógico

Source: Elaboration of the authors (2021).

The survey pointed out a variety of issues related to digital technologies related to issues in the area of education, addressed in the three magazines. Themes that go directly through teacher training (Nogueira et al., 2015; Bersch & Sechlemmer, 2018; Souza & Borges, 2018; A Ponticelli, et al. 2013; Purificação & Pessoa, 2015; Souza & Bonilla, 2014; Marzari & Leffa, 2013; Linhares & Avila, 2017), teaching practices with the use of digital technologies (Junior et al., 2018; Bianchessi & Mendes, 2019; Porto & Porto, 2012; Bassani et al., 2013; Almeida, 2013; Silveira et al., 2012; Medeiros & Wunsch, 2019; Pinto & Matos, 2019; Nogueira et al., 2015), issues in the field of digital inclusion (Flores, 2013; Souza & Bonilla, 2012; Lima & Almeida, 2015), and reflections on the influence of digital culture in contemporary education (Miranda & Fantin, 2015; Lucena & Oliveira, 2014; Valencia & Panaqué, 2019; Santos et al., 2013; Fantin, 2006; Pireddu, 2013; Santaella, 2014; Almeida & Araújo, 2013; Pedro, 2017).

From Table 1, it is possible to see that research in the field of educational technologies has had a considerably significant growth around different themes, which discuss the educational processes from different conceptions, perspectives and analyzes. In the next section we will do a more detailed analysis and categorization of the productions and themes elucidated previously.

3.1 Analysis and discussion: emerging categories in the study

Considering the objective proposed in this study, after conducting a survey of productions, we move on to the next stage, which concerns the categorization of the 29 most cited studies on Google Scholar. At this stage, after reading the abstracts and keywords, the articles were grouped into 4 categories: 1) Teaching practices; 2) Teacher training; 3) Digital Inclusion and; 4) Digital Culture, as described below in table 2.

Board 2: Distribution of productions by categories

CATEGORIES	TITLE	AUTORS	PERIODIC
TEACHING PRACTICE	Utilização das TIC no ensino de Português: o olhar revelador dos professores	Neto (2012)	Revista Tempos e Espaços em Educação
	Aplicativos móveis para a alfabetização e letramento no contexto do ensino fundamental	Junior et al., (2018)	Revista Tempos e Espaços em Educação
	Ensino de história por meio de jogos digitais: Relato de aprendizagem significativa com games	Bianchessi & Mendes (2019)	Revista Tempos e Espaços em Educação
	Uso de blogs no processo de aprendizagem de literatura no ensino médio	Porto & Porto (2012)	Revista de Educação, Ciência e Tecnologia
	Práticas pedagógicas com a web 2.0 no ensino fundamental	Bassani et al. (2013)	Revista Espaço Pedagógico
	Produção de vídeos em sala de aula: Uma proposta de uso pedagógico de celulares e câmeras digitais	Almeida (2013)	Revista de Educação, Ciência e Tecnologia
	Utilização de jogos digitais para o desenvolvimento do raciocínio lógico-matemático	Silveira et al., (2012)	Revista de Educação, Ciência e Tecnologia
	Ensino de programação em robótica com Arduino para alunos do ensino fundamental: relato de experiência	De Medeiros &; Wünsch (2019)	Revista Espaço Pedagógico
	A Programação de jogos como um instrumento motivador da aprendizagem	Pinto & Matos (2019).	Revista Espaço Pedagógico

TEACHERS TRAINING	Desafios e oportunidades do uso da tecnologia para a formação contínua de professores: uma revisão em torno do tpack em Portugal, Brasil e Espanha	Nogueira et al., (2015)	Revista de Educação, Ciência e Tecnologia
	Formação Continuada em contexto híbrido e multimodal: ressignificando práticas pedagógicas por meio de projetos de aprendizagem gamificados	Bersch & Schlemmer (2018)	Revista Tempos e Espaços em Educação
	Educação a Distância, TIC e formação de professores de pedagogia: um estudo de caso a partir da mídia-educação	Souza & Borges (2018)	Revista Tempos e Espaços em Educação
	A Educação a Distância como auxílio na formação de professores	A Ponticelli et al., (2013)	Revista de Educação, Ciência e Tecnologia
	O ensino da matemática em meio à tecnologia: desafio aos programas de formação de professores	Purificação & Pessoa (2015)	Revista de Educação, Ciência e Tecnologia
	A cultura digital na formação de professores	Souza & Bonilla (2014)	Revista Tempos e Espaços em Educação
	O letramento digital no processo de formação de professores de línguas	Marzari & Leffa 2013)	Revista de Educação, Ciência e Tecnologia
	Cinema e educação para além do conteúdo	Linhares & Avila (2017)	Revista Tempos e Espaços em Educação
INCLUSÃO DIGITAL	Um computador por aluno: possibilidades de inclusão e letramento digital	Flores (2013)	Revista Espaço Pedagógico
	Os jovens na contemporaneidade: a experiência da articulação entre a dinâmica da escola e um projeto de inclusão digital	Souza & Bonilla (2012)	Revista Espaço Pedagógico
	Letramento digital de idoso no contexto da EJA em Mossoró-RN	Lima & Almeida (2015).	Revista de Educação, Ciência e Tecnologia
DIGITAL CULTURE	A singularidade na multiplicidade: crianças e tecnologias móveis na escola no contexto da cultura digital	Miranda & Fantin (2015).	Revista Tempos e Espaços em Educação
	Culturas digitais na educação do Século XXI	Lucena & Oliveira (2014).	Revista Tempos e Espaços em Educação
	Pensamiento computacional: una nueva exigencia para la educación del siglo XXI	Valencia & Panaqué (2019)	Revista Espaço Pedagógico
	Mapeamento de jogos educacionais	Santos et al., (2013)	Revista Espaço Pedagógico
	As crianças e o repertório lúdico contemporâneo: entre as brincadeiras tradicionais e os jogos eletrônicos	Fantin (2006).	Revista Espaço Pedagógico
	Hacking education. A formação entre a abertura e a tecnologia	Pireddu (2013).	Revista Espaço Pedagógico
	A aprendizagem ubíqua na educação aberta	Santaella (2014)	Revista Tempos e Espaços em Educação
	O uso de dispositivos móveis no contexto educativo: análise de teses e dissertações nacionais	Almeida & Araújo (2013).	Revista Tempos e Espaços em Educação
	Ambientes educativos inovadores: o estudo do fator espaço nas 'salas de aula do futuro' portuguesas	Pedro (2017).	Revista Tempos e Espaços em Educação

Source: Elaboration of the authors (2021).

Composing the category Teaching Practices, there are 9 productions that together account for 31% of the works that were raised in the systematic review process, in common, these productions carry a practical and reflective bias on the insertion of digital technologies as a didactic-pedagogical resource in space Neto (2012) investigated the applicability of these technologies in the teaching of Portuguese, the limits and challenges faced by teachers in their practices, and the way students deal with the technological context in the school environment, the study was carried out in two schools public school system in the municipality of Fátima/BA. From documentary analysis and interviews, the author highlights a huge gap in the way teachers and students dealt with technologies; on the one hand, the teacher is resistant to the implementation or adaptation for such use, on the other, the students who easily manipulate the technologies. As a result, the study pointed out the need to rethink the educational process in technological contexts, aiming at the significant use of digital resources in a more effective way.

From a theoretical perspective from the survey of productions available on the web, Junior et al., (2018) in their study analyzed the didactic-pedagogical methodologies expressed in mobile applications, and how they could contribute to the process of literacy and digital literacy in the series In addition to a survey of productions, Bassani et al., (2013) in a bibliographic research based on the works published in the annals of the Brazilian Symposium on Informatics in Education (SBIE, 2012) and the Workshop on Informatics in Education (WIE, 2012) and survey of articles published in the Magazine Novas Tecnologias na Educação, sought to present an overview of teaching practices with the use of web 2.0 resources, involving interactivity and media sharing, within the scope of the final grades of Elementary School.

Almeida (2013), on the other hand, when considering the transformations resulting from technological advances and the inevitable insertion in the educational field, sought to describe a teaching practice based on the use of cameras, cell phones and literary texts in the creation of videos in the classroom. While Medeiros and Wunsch (2019) report teaching practices when programming a platform, through a course designed for students in the final grades of elementary school in nine public schools in Curitiba, the perspective presented in that study goes beyond the insertion of digital technologies, considering that the students who participated in the study are part of groups of robotics competitions, however, they were not familiar with the platform that would be programmed. As a result, the study pointed out the students' ease of learning when programming a virtual interface, as well as how to adapt, handle and assimilate basic programming concepts.

In the perspective of interactive interfaces, Porto and Porto (2012) reflect on the use of Blogs as online spaces that can enhance the teaching and learning process in the curricular component of Literature in High School, with the aim of pointing out how these interfaces can motivate students. students to learn and analyze literary texts, as well as broaden the student's interest in learning Literature, narrowing the existing relationships between textual genres, technologies and cyberspace. Bianchessi and Mendes (2019), Silveira et al., (2012) and Pinto and Matos (2019) developed their studies on digital games in education, and how these interactive interfaces can be used significantly for didactic and pedagogical purposes, as an element learning motivator.

With 8 productions, totaling 27.6% of the works found, the category Teacher Training gathers works that focus on the influence of technologies in the process of initial and continuing training of teachers. In the field of continuing education, we can see the work of Nogueira and Gallego (2015) and, Bersch and Schlemmer (2018) that reflect on the challenges and possibilities of using technologies in the preparation of teaching professionals, emphasizing the relevance of continuing education in hybrid contexts, so that teaching practice can be re-signified. Souza and Borges (2018) and Ponticelli et al., (2013) weave their studies on the contributions of Distance Education to the training of teachers in Brazil.

In this same perspective, Souza and Bonilla (2014) present reflections on the process of teacher training in the context of digital culture, the study is the result of a Master's in Education research, based on an articulation of projects between student teachers

at the Faculty of Education. Education at the Federal University of Bahia (UFBA) and public school teachers in the municipality of Irecê/BA. As an objective, the study sought to reflect and analyze the actions developed in the Pedagogy course, presenting and discussing the experience in digital contexts, and the possibility of integrating digital culture into the training processes of teachers

In the context of digital literacy in the process of teacher training, Marzari and Leffa (2013) discuss the extent to which Information and Communication Technologies (ICT) are present in teacher training for language teaching in Brazil, both in their mother tongue and in their native language. foreign languages, based on the identification of digital literacy practices. The study reveals that the presence of technologies in the Language courses is, in most cases, restricted to extracurricular activities that occur throughout the course and in some elective courses. Purification and Pessoa (2015), through a documentary research, reflect on the challenges of the mathematics teacher training programs in the face of constant technological innovations. While Linhares and Avila (2017) reflect on the relationship between cinema, education and the training of educators, investigating the possibilities of mediation, decoding and representation of cinema for the cognitive exercise of learning beyond content, through a qualitative and quantitative research in Pedagogy courses from three higher education institutions, the study pointed out multiple and complex approaches in what it says I respect the association of film with content, giving rise to a broad process of reflection and perception about everyday knowledge and practices.

The category Digital Inclusion was the one that got the least prominence, composed only by three productions equivalent to 10.3% of the works found. In this category are the productions of Flores (2013), Souza and Bonilla (2012) and, Lima and Almeida (2015) who jointly discuss the need for digital inclusion in the school space.

Flores (2013), in their theoretical work, reflect on education in the context of Information and Communication Technologies (ICT), with emphasis on the processes of digital inclusion, technological literacy

and digital literacy. According to the author, it is not enough to install technologies in the school space, but it is necessary to develop a concept of use. Souza and Bonilla (2012) present some results of a master's research carried out between 2009 and 2010, with young people from two public schools in the city of Irecê/BA, aiming to reflect on the constitution of digital culture among these subjects who were integrated in a digital inclusion project.

In this same perspective of digital inclusion, Lima and Almeida (2015) investigated the insertion of digital literacy practices with elderly members of Youth and Adult Education, offered by the Youth and Adult Education Center (CEJA), in the municipality of Mossoró, in the According to the authors, the lack of approximation of individuals with technologies means that they do not participate in social processes, specifically in the elderly, thus emphasizing the gaps in the teaching and learning process in EJA for the promotion of digital literacy.

Composed of 9 productions, about 31% of the works found, the Digital Culture category encompasses discussions that have become trends in the educational field in recent years, when considering the reflexes of technological evolution and the impacts caused on education, specifically, in the teaching process and learning. In this context, Lucena and Oliveira (2014) and Santaela (2014) reflect on 21st century education, with regard to advances in digital technologies and the influence of digital culture in learning contexts. Santos et al., (2012) mapped free educational games in order to suggest pedagogical practices that facilitate the incorporation of digital culture in the school environment, collaborating in the construction and assimilation of concepts.

In the context of digital culture in Early Childhood Education, Miranda and Fantin (2015) reflect on mobile technologies in the school space, with the aim of analyzing the multiple languages involved in the teaching and learning process from the perspective of media-education. Fantin (2006), on the other hand, discusses the playful aspects in contemporary times, considering the contributions of games and electronic games to the child's cognitive, social and cultural development.

Still on digital mobile technologies, Almeida and Araújo (2013) mapped in the CAPES repository dissertations and theses on the use of mobile devices for didactic-pedagogical purposes in formal education in Brazil, from 2003 to 2012. Pedro (2017) in his production on innovative educational environments, he addresses the classroom of the future, reflecting on new teaching methodologies, in this case active methodologies and the use of digital technologies for didactic-pedagogical purposes and the development of multiple and varied skills.

Discussing computational thinking and the new requirements for 21st century education, Valencia and Panaqué (2019) emphasize that education should promote skills that are related to computational thinking "considering critical thinking and where a problem can be decompose, process data, create procedures and generalize them" (p. 323). Pireddu (2013) proposes a reflection on digital communication technologies, in the context of networked environments, and the way they influence social relationships, and the way they teach and learn in cyberspace, considering that the user is each increasingly participative on the web, posing new challenges to education systems in the face of the need to adapt to digital culture.

4 Final considerations

Researches involving technologies go through a whole advance, from the concept of the term, the evolution of old Information Technologies (IT), the inclusion of mass communication processes with Information and Communication Technologies (ICT), also explaining the need for inclusion in the digital world, including Digital Information and Communication Technologies (TDIC), even more contemporary discussions involving Mobile Information and Communication Technologies (TMDIC).

With this understanding and in the analyzed perspective, one can perceive, among other approaches, those aimed at the insertion of technologies in the educational field, a reality necessary for the process of teaching and learning, especially in this time of pandemic, as well as the significant increase in production in journals. contributing to the improvement of professionals who intend to interconnect to cyberspace.

Thus, there is an increasing number of publications focused on technologies in education, especially in the analyzed magazines indicating the relevance of the theme addressed and mapped, representing 39% on teaching practice, 26.7% Teacher training and with less expression, 10 , 3% in the Digital Inclusion category. However, it is a current fact that publications involving the main theme of this text have advanced considerably.

Through the mapping developed in this study, it was possible to perceive the growing influence of digital technological resources in the educational perspective due to media advances and the improvement of communication and information in the network society.

This study contributes directly to the field of education, considering that the survey conducted here aimed to give visibility to other studies on digital technologies in this field of knowledge, while bringing current perspectives that still need to be rethought for teaching and learning, such as inclusion and digital literacy. Therefore, with so many technological advances, inequality of access is still a problem to be faced in the "computerized society", as well as educating in digital culture is a challenge for teachers who have not been prepared to act in technological and digital contexts. It is even more evident when compared to the current context of remote classes in the face of the pandemic.

Finally, the analyzed authors consider the importance of technologies and draw attention to the varied possibilities of using them in the educational field in an informational and technological society. As Oliveira says; Vasconcelos (2018, p. 76) "It is possible to state that information and communication technologies have an essential role as a pedagogical support for the teacher to draw the student's attention to the objective that he (the teacher) intends". However, the technology used does not determine the teaching methodology. If the teacher is a follower of a traditional pedagogy, even if he uses all technological supports in the classroom, his methodology will remain traditional, even in a digital culture.

The possibilities of using the technologies presented indicate paths for the teacher who intends to

adopt a methodology that encourages reflection, research, anxiety and "mistrust" in the face of the range of information that is presented externally as unquestionable truths, as well as drawing attention for the importance of knowing how to think and interact with technologies to transform the reality in which we live. It is up to us the important mission of transforming information into knowledge and pointing out ways so that the student is not filled with alien ideas and empty of his own ideas, especially in this time of Covid-19, in which technologies and their derivatives are the most used means of Communication.

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