INITIAL TRAINING OF PEDAGOGUES AND THE USE OF DIGITAL TECHNOLOGIES: A CURRICULAR ANALYSIS OF UNDERGRADUATE COURSES FROM PUBLIC UNIVERSITIES OF SÃO PAULO

FORMAÇÃO INICIAL DE PEDAGOGOS E O USO DAS TECNOLOGIAS DIGITAIS: UMA ANÁLISE DOS CURSOS DE GRADUAÇÃO DE UNIVERSIDADES PÚBLICAS PAULISTAS

FORMACIÓN INICIAL DE PEDAGOGOS Y EL USO DE LAS TECNOLOGÍAS DIGITALES: UN ANÁLISIS DE LOS CURSOS DE PREGRADO DE LAS UNIVERSIDADES PÚBLICAS DE SÃO PAULO

Maria Carolina Branco Costa Antunes de OLIVEIRA[1]
e-mail: ma.carolinabc@gmail.com

Viviane Cristina GARCIA DE STEFANI[2]
e-mail: vivigarcia@ifsp.edu.br

How to reference this article:

OLIVEIRA, M. C. B. C. A. de; GARCIA DE STEFANI, V. C. Initial Training of pedagogues and the use of digital technologies: A curricular analysis of undergraduate courses from public universities of São Paulo. **Revista Ibero-Americana de Estudos em Educação**, Araraquara, v. 18, n. 00, e023063, 2023. e-ISSN: 1982-5587. DOI: https://doi.org/10.21723/riaee.v18i00.16207

| **Submitted**: 29/01/2022
| **Revisions required**: 15/03/2023
| **Approved**: 06/06/2023
| **Published**: 27/09/2023

[1] Federal Institute of São Paulo (IFSP), São Carlos – SP – Brazil. PhD student and master in Education (FE/UNICAMP) and Basic Education teacher in the municipal education network of Valinhos.
[2] Federal Institute of São Paulo (IFSP), São Carlos – SP – Brazil. PhD in Linguistics (UFSCar) and effective professor of Spanish, Portuguese and English at IFSP - São Carlos.

ABSTRACT: This article aims to investigate the knowledge about Digital Technologies of Information and Communication (DTIC) in the initial training of pedagogues. The data of the documentary research were collected at public universities of São Paulo State, particularly at those that offer undergraduate courses in pedagogy in face-to-face modality. Documents that contextualize the legal scenario on teachers training and the pedagogical projects of the selected courses were analyzed, including their curricular structure and teaching plans for the subjects that discuss DTIC. Documentary analysis is based on the qualitative approach and the principles of Content Analysis (BARDIN, 1977). The results point to the need for curricular updates, which collaborates to put the theme in perspective and at the center of educational debates about teachers training.

KEYWORDS: Digital technologies. DTIC. Teachers training. Pedagogy. Curriculum.

RESUMO: *Este artigo objetiva identificar os conhecimentos sobre Tecnologias Digitais da Informação e Comunicação (TDIC) na formação inicial de pedagogos. Os dados da pesquisa documental foram coletados em universidades públicas estaduais e federais paulistas, particularmente, as que ofertam cursos de graduação em pedagogia na modalidade presencial. Foram analisados documentos que contextualizam o cenário legal sobre formação docente e os projetos pedagógicos dos cursos selecionados, incluindo sua estrutura curricular e planos de ensino das disciplinas que discutem as TDIC. A análise documental ancora-se na abordagem qualitativa e nos princípios da análise de conteúdo (BARDIN, 1977). Os resultados apontam a necessidade de atualizações curriculares, o que colabora para colocar a temática em perspectiva e no centro de debates educacionais sobre formação de professores.*

PALAVRAS-CHAVE: *Tecnologias digitais. TDIC. Formação inicial docente. Pedagogia. Currículo.*

RESUMEN: *Este artículo tiene por objetivo identificar los conocimientos sobre las Tecnologías Digitales de Información y Comunicación (TDIC) en la formación inicial de pedagogos. Los datos de la investigación documental fueron recolectados en las universidades públicas estatales y federales de São Paulo, particularmente las que ofrecen cursos de pregrado en pedagogía en la modalidad presencial. Fueron analizados documentos que contextualizan el escenario sobre la formación docente y los proyectos pedagógicos de los cursos seleccionados, incluyendo su estructura curricular y planes de enseñanza para las asignaturas que discuten TDIC. El análisis documental se basa en el enfoque cualitativo y en los principios del Análisis de Contenido (BARDIN,1977). Los resultados señalan la necesidad de actualización curricular, lo que colabora para poner el tema en perspectiva y en el centro de los debates educativos sobre la formación del profesorado.*

PALABRAS CLAVE: *Tecnologias digitales. TDIC. Formación inicial del profesorado. Pedagogía. Curriculo.*

Introduction

The progressive introduction of Digital Information and Communication Technologies (DICT or TDIC, in Portuguese) in Education has accentuated educational challenges, by provoking reflection on consolidated paradigms on ways of teaching and learning and by calling on teachers to (re)configure their teaching practice.

Network Education is a process that began in 1970, with the emergence of the personal computer (GOMEZ, 2004) and, over the years, it becomes more complex, integrating new software and encouraging collaborative processes. Over the years, collective intelligence (LEVY, 2007) improves digital spaces, as well as devices, enabling interaction, communication and access to knowledge.

Since the 1990s, researchers have addressed the issue of teacher training in the context of technology, a topic that has become more frequent in the last decade. Since that time, they have already noted the need to rethink the curricular structure of initial teacher training courses, with regard to the relationship between teaching-learning approaches, the impacts of digital technical-semiotic instruments in training and new ways of [3]teaching and learn (SILVA, 2011; KENSKI, 1998). In the current situation, TDIC are "more than simple supports, that is, they interfere with our way of thinking, feeling, acting, relating socially and acquiring knowledge" (KENSKI, 2003, p. 23-24, our translation).

In the Digital Era (CHARTIER, 2017), the form of communication and access to information enables other relationships with knowledge (CASTELLS, 2018; LEVY, 2007). As a result, the teacher becomes even more important in his relationship with students, as the one who guides the ways of use, and, aware of his social role, acts as a mediator between the information obtained in an unsystematic way and knowledge. However, the teacher also needs to be trained in the proper use of networks and digital devices. Thus, recognizing the importance of the pedagogue in pedagogical processes and in facing contemporary educational demands, as well as the centrality of the curriculum as a guiding element in the formation and transformation of teaching practices and knowledge, it is interesting to investigate how the initial training of this professional has occurred in public universities from the state of São Paulo, asking: how have pedagogy courses at state and federal universities in São Paulo addressed the educational use of TDIC in their curricular proposal? Which pedagogical

[3] The studies of Pino (2003) and other researchers in Historical-Cultural Psychology in Brazil led to the creation of the term "technical-semiotic instrument", which refers here to digital instruments such as computers, tablets and *smartphones*. Such instruments condense form and content and mean that they are inseparable, since they are oriented towards action and the psyche.

paradigms do these curricular proposals link to and what are the implications for teaching practice?

Faced with such questions, this research aimed to identify knowledge about Digital Information and Communication Technologies (DIT) in the initial training of pedagogues. To this end, a survey and analysis of the curricular matrices of pedagogy courses at three state universities and two federal universities in São Paulo, prepared between 2015 and 2020, were carried out, as well as the teaching plans, aiming to discuss the pedagogical paradigms in which they were anchored.

What the teaching guiding documents say

Although normative documents suggest the use of digital technologies in Education; such as the National Education Guidelines and Bases Law 9394/96, the National Curricular Parameters (PCNs) and the National Common Curricular Base (BNCC); studies by Lopes and Fürkotter (2016) and Marfim and Pesce (2017) point out gaps in the curricular organization of pedagogy courses regarding discussions about the use of digital technologies in the teaching-learning process.

In the legal scope, the 2015 National Curricular Guidelines, referring to the *Training of Basic Education Teachers, at higher level, degree course, full degree,* highlight, in Chapter II, Article 5:

> Art. 5 The training of teaching professionals must ensure a common national basis, guided by the conception of education as an emancipatory and permanent process, as well as by the recognition of the specificity of teaching work, which leads to praxis as an expression of the articulation between theory and practice and to the requirement that the reality of the environments of educational institutions of basic education and the profession be taken into account, so that the graduate can be guided: [...]
> *VI - The competent use of Information and Communication Technologies (ICT) to improve pedagogical practice and expand the cultural training of teachers and students* (BRASIL, 2015, emphasis added, our translation).

TDICs in pedagogical practice is evident, and the mention of the *competent use* of these technologies denotes even more emphasis on the importance of this topic being worked on in pedagogy degrees. What is also mentioned in Chapter III, Article 8 stands out:

> Art. 8 Graduates of initial higher education training courses must, therefore, be able to:[...]

> *V - Relate the language of the media to education, in didactic-pedagogical processes, demonstrating mastery of information and communication technologies for the development of learning.* (BRASIL, 2015, authors' emphasis, our translation).

According to the Curricular Guidelines for the Pedagogy Course, established in Resolution CNE/CP nº. 1/2006:

> Art. 4 The Degree in Pedagogy course is intended for the training of teachers to exercise teaching functions in Early Childhood Education and in the initial years of Elementary School, in High School courses, in the Normal modality, in Professional Education in the area of services and school support and in other areas in which pedagogical knowledge is provided. [...]
> III - production and dissemination of scientific-technological knowledge in the educational field, in school and non-school contexts. [...]
> Art. 5 Graduates of the Pedagogy course must be able to: [...]
> VII - relate the languages of the media to education, in didactic-pedagogical processes, demonstrating mastery of information and communication technologies suitable for the development of significant learning (BRASIL, 2006, p. 02, our translation).

Although such guidelines encourage debates about TDIC during the pedagogue's initial training, a large part of the courses in this degree are still being adapted or do not include mandatory subjects focused on this topic, that is, subjects that integrate the backbone training of all students. In situations where there is the presence of disciplines that include discussions about TDIC, the use of digital instruments is identified as a tool for carrying out activities on site, evidencing a paradigm of technical rationality. There are also disciplines that evoke traditional forms of interaction or that approach the digital dimension in an exclusively theoretical way, without deepening, continuity or encouraging practices.

In order to compare the arguments about the need to include digital technologies in the initial training of pedagogues in accordance with legal guidelines, it is highlighted that the BNCC (Common National Curricular Base) provides for the "General Competencies of Basic Education", mentioning work with digital language at school, in the following terms:

> 1. Value and use historically constructed knowledge about the physical, social, cultural and digital world to understand and explain reality, continue learning and collaborate towards the construction of a fair, democratic and inclusive society.
> [...]
> 4. Use different languages – verbal (oral or visual-motor, such as Libras, and written), body, visual, sound and digital –, as well as knowledge of artistic, mathematical and scientific languages, to express oneself and share

> information, experiences, ideas and feelings in different contexts and produce meanings that lead to mutual understanding.
> 5. Understand, use and create digital information and communication technologies in a critical, meaningful, reflective and ethical way in different social practices (including school practices) to communicate, access and disseminate information, produce knowledge, solve problems and exercise protagonism and authorship in personal and collective life. (BRAZIL, 2017, p. 09, our translation)

Since digital instruments permeate contemporary society, interaction with these devices deserves teaching guidance, aiming to collaborate in expanding the meanings produced by students, to the extent that teachers recognize them as teaching objects and use them as pedagogical resources, incorporating such devices into their educational praxis. Therefore, it is agreed that:

> It is important that the school institution maintains its commitment to stimulating reflection and in-depth analysis [...]. However, it is also essential that the school understands and incorporates new languages and their ways of functioning, revealing possibilities of communication (and also manipulation), and that it educates for more democratic uses of technologies and for a more conscious participation in digital culture. (BRASIL, 2017, p. 59, our translation).

Conceiving the importance of mediations for the process of cultural appropriation and for the development of subjects, provided by interpersonal interactions and technical-semiotic instruments, it is considered that integrating TDIC into educational practices is not something easy, but deserves investigation, having with a view to strengthening the school as a guiding and experiential space for social practices.

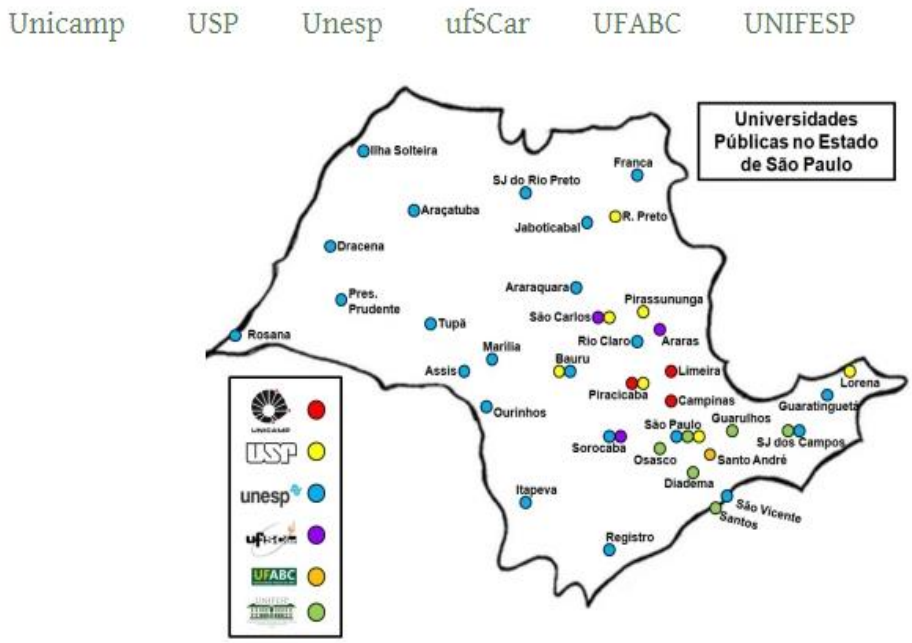
Faced with such considerations, the timid contribution of São Paulo state and federal universities to the feasibility of training experiences within the scope of TDIC is problematized, distancing themselves from the demands of the contemporary sociocultural context, as already pointed out by Marfim and Pesce (2017).

Methodological aspects

Documentary research is described by Severino (2007, p. 122-123) as one that uses different documents as a source, whose textual contents "have not yet had any analytical treatment, they are still raw material, from which the researcher will develop its investigation and analysis". Here, we sought to organize the curricular matrices of twelve pedagogy courses, as well as the teaching plans for subjects that included discussions on ICTs, TDICs, NTICs [4], media, technologies in/of education, and analyze them from a qualitative approach which, according to Lüdke and André (1986), presents as its central characteristic the detailed descriptions and analyses, compared to social, historical and political determinations.

The offer of pedagogy courses was mapped according to the inclusion criteria: face-to-face courses, located in the state of São Paulo and offered by public institutions. In this way, five universities were selected: three state universities (USP; UNESP; UNICAMP) and two federal universities[5] (UFSCAR; UNIFESP), distributed across twelve campuses.

Figure 1 – State and federal universities in the state of São Paulo



Source: TRIU Course[6]

[4]ICTs - Information and Communication Technologies; TDIC – Digital Information and Communication Technologies; NTICs - New Digital Information and Communication Technologies.
[5]UFABC was not included in the study because it did not meet all the inclusion criteria, as it did not offer, during the period of preparation of this study, the pedagogy course in person.
[6]See https://cursinhopopulartriu.wordpress.com/2011/06/19/localizacao-universidades/

The survey of the curricular matrices focused on the presence of mandatory and elective subjects that mentioned, in the titles, the use and/or application of digital technologies, which allowed the organization of a table.

Table 1 – Mapping of the curricular matrices of pedagogy courses at São Paulo State and Federal Universities/Institutes

UNIVERSITY	CITY	DOC DATE	SUBJECT AND TIME OF THE COURSE	ACRONYM	OBLIGATORINESS
UNICAMP	Campinas	2020	Education and technologies (4th year)	ET	Mandatory
USP	Ribeirão Preto	2017	Instrumental computing	INFI	Elective
	São Paulo	2019	-	-	-
UNESP	Araraquara	2017	-	-	-
	Marília	Not included	-	-	-
	Bauru	2018	Digital Information and Communication Technologies in pedagogical practice (4th year)	TDICPP	Mandatory
	President Prudente	Not included	Media and technologies applied to Education (2nd year)	MTAE	Mandatory
	Sao Jose do Rio Preto	2015	1) Media and education (3rd year) 2) Information and Communication Technologies applied to education (4th year)	ME	Mandatory
	clear river	2015	Information and communication technologies in education	TDICE	Elective
UFSCAR	San Carlos	2018	-	-	-
	Sorocaba	2017	-	-	-
UNIFESP	Guarulhos	2018	-	-	-

Source: Prepared by the authors

As can be seen in table 1, among the twelve courses consulted in the last five years (2015 to 2019), there is the presence of mandatory subjects with the theme of TDIC in four of them: one at UNICAMP and three at UNESP, on the Bauru campuses, Presidente Prudente and São José do Rio Preto, which focus, in short, on the last years of the undergraduate course (3rd and 4th years). It is also observed the presence of elective subjects in two courses: USP Ribeirão Preto and UNESP Rio Claro, and the lack of subjects linked to TDIC in six courses (USP São

Paulo; UNESP – Araraquara and Marília; UFSCAR – São Carlos and Sorocaba; UNIFESP Guarulhos).

Among the mandatory subjects, all of them highlight, in the title, the presence of technologies linked to education, mentioning pedagogical practice or the school setting. Among the elective courses, only one of them is exclusively focused on the machine's operating modes, a skill that, although important and fundamental, does not involve discussing its applications in the classroom.

It is observed that, although the courses at UNESP and USP follow common regulations, as they belong to the same institutions, the different faculties of these universities have different curricular guidelines regarding the offering of subjects focused on TDIC, even though subjects such as Philosophy, Sociology and History of Education changed little in terms of offering, obligation and period of the course, which leads to problematizing the reasons for this.

The interpretation of these data leads us to reflect on the organization of courses in relation to the offer of subjects and the teaching staff, as well as comparing this offer with the existence of undergraduate and postgraduate courses focused on the areas of Technology on the same campus, which could promote an interdisciplinary approach between scientific areas. This seems to occur in institutions that offer subjects linked to TDIC, which bring together courses in Exact Sciences, Biology and Humanities – which provides an opportunity for interdisciplinary rapprochement between teachers and students.

The theme of TDIC in pedagogy courses

of seven subjects were analyzed – five mandatory and two elective – with the occurrence of the topic, focusing on syllabuses and general characteristics,[7] as shown in table 2. The analysis was based on the studies of Pérez Gómez (1997), regarding discussions about technical rationality or practical rationality, and was anchored in the principles of content analysis, which guided the selection, organization and document analysis. For Bardin (1977), this approach can be understood as:

[7]The teaching programs can be accessed in full on the official websites of the universities investigated.

> [...] *a set of communications analysis techniques that uses systematic and objective procedures for describing the content of messages*. [...]. The intent of content analysis is *inference of relative knowledge to the conditions of production and reception of messages, an inference that uses indicators (quantitative, or not)* (BARDIN, 1977, p. 38, authors' emphasis, our translation).

Considering these guidelines, we sought to understand the assumptions underlying the selected documents, among which the most recurrent terms stood out or those that summarized the perspective of the discipline, indicating trends and pedagogical assumptions.

Regarding the pedagogical paradigm, it is clear that technical rationality (PÉREZ GÓMEZ, 1997) comprises the appropriation of specific content, linked to ways of using the machine, which could serve as a subsidy for the operation of software used in other disciplines, such as case of Virtual Learning Environments (VLE). For Schön (1997), practical rationality is based on theoretical knowledge and analyzed practice, involving practical training consistent with its field of activity. The practices of curricular internships or pedagogical workshops stand out as an example, in which the student can integrate certain themes discussed in academia into the empirical context, by carrying out practical activities that challenge them to use them in the teaching-learning process.

In the context of training based on practical rationality, when experiencing training spaces that make it possible to collectively discuss and analyze experiences theoretically, the future teacher would potentially come across the limits and scope of the use of TDIC in Education and would be better able to propose other ways of use, learning to use them with more confidence, intentionality and criticality, as well as greater control over the articulation between theory and practice.

Analysis of the syllabi of the investigated courses

Next, the syllabi of the aforementioned disciplines are presented, as well as other characteristics that will help in identifying the pedagogical paradigms to which they are linked, in order to analyze the way in which DICT has been approached.

Table 2 – Syllabuses and objectives of subjects with TDIC occurrence

discipline	Menu	General features	Pedagogical paradigm
ET/OB (UNICAMP)	**Interdisciplinary approach**, proposing the treatment of communication and information technologies in the **educational environment**. Students will experience **practical situations** that will lead them to **critically reflect** on the use of technologies in education.	Theoretical-practical discipline; Objective: aesthetic experiments with images and texts in dialogue with visual, digital and analogue culture. Assessment: video recordings are expected at school using cell phones and articulation with cinema.	Practical rationality
TDICAPP/OB (UNESP Bauru)	The articulating discipline of the semester, of a theoretical and practical nature, aims to articulate the contents of the other disciplines through the central axis of the course, that is, pedagogical practice in contemporary basic education schools; carrying out **interdisciplinary studies** and providing reflection on the **pedagogue's role in the use of TDIC in the teaching process**. To achieve this, it is necessary to study the concept of technology and its relationship with pedagogical practice in basic education schools; the use of TDIC in teaching situations; knowledge and evaluation of educational portals, software and other content available on web 2.0.	Theoretical-practical discipline; Objective: aesthetic experiments with images and texts in dialogue with visual, digital and analogue culture. Assessment: video recordings are expected at school using cell phones and articulation with cinema.	Practical rationality
MTAE/OB (UNESP Presidente Prudente)	**Analytical study** on the articulation of the pedagogical use of media and technologies, specifically TDIC **in the school context** (basic education, youth and adult education and management) and in initial teacher training. Knowledge and approaches to media, technologies, cyberculture and teaching resources.	Theoretical-practical discipline; Objectives: To understand and reflect on teaching practices, using **hypermedia language** (**videos, software, internet and virtual learning environment**); learn to teach with TDIC in early childhood education and the early years of elementary school; Methodology: dialogued lectures, guided study and group work, including experience in a **computer laboratory** and on digital devices (**cell phones and tablets**) Assessment: diagnostic, instructional and formative, providing for the development and presentation of a pedagogical resource that uses media resources or TDIC for basic education.	Practical rationality
ME/OB	The subject aims to develop an **understanding of the process of building school knowledge mediated**	Theoretical-practical discipline;	Practical rationality

(UNESP São José do Rio Preto)	**by** symbolic representations established between the student and the **media**. **Analyzes** the **contributions and limitations of the use of information and communication technologies in school education**.	Objectives: Understand the concepts of **instructional and constructionist media education**; Methodology: lectures, debates, case studies and projects; Assessment: record, seminar, test and intervention project using media.	
TDICAE/OB (UNESP São José do Rio Preto)	The subject aims **to identify** the cultural elements of contemporary society resulting from technological innovation and **analyze** the **potential of ICT** in general and, more specifically, of **Web 2.0 tools** in **school education**.	Theoretical discipline; Objectives: understand changes in the digital society, approaches to **computer use** and types of **educational software**; Methodology: readings, seminars, discussions, development of teaching-learning situations using ICT; Assessment: attendance, development of an educational situation involving **ICT/Web 2.0z**, seminar and test.	Practical rationality
IFI/EL (USP Ribeirão Preto)	**Expository theoretical classes**, complemented with exercises in the classroom, with the guidance of the teacher. **Solving exercises and applying practical** programming work.	Theoretical discipline; Methodology: expository classes; Assessment: didactic presentation involving bibliographic research on the internet, database research, organization of data in files, writing, editing and formatting of a monograph corresponding to the research carried out, manipulation of images, editing and formatting of graphics, construction of calculation spreadsheets and editing presentations.	Technical rationality
TDICE/EL (UNESP Rio Claro)	The subject focuses on the **study and characterization** of recent information and communication technologies, seeking **to analyze** their possibilities and **potential for the work of teachers in basic education**. Different digital tools will be studied, comprising equipment and applications, aiming to **develop a teaching proposal using the ICTs analyzed**.	Theoretical-practical discipline; Objectives: Critically understand the pedagogical potential of ICT and its implications for teaching-learning in basic education; Methodology: lecture, theoretical analysis, **guided study with web browsing**, lectures and monitored visits, **collaborative construction of educational projects, blog entries**; Assessment: continuous, involving participation in theoretical-practical activities, reviews and seminars.	Practical rationality

*Note: OB: Mandatory/ EL: Elective.
Source: Authors' elaboration and emphasis

The analysis of the syllabi and general characteristics of these subjects points to the occurrence of interdisciplinary and expository classes, articulation between theoretical and practical activities based on identification, analysis, critical reflection, understanding and development of teaching proposals that integrate TDIC into teaching-learning situations in

school education. Among the seven disciplines focused on, six can be configured with the paradigm of practical rationality and one with the paradigm of technical rationality.

It is considered that these subjects comply with a training proposal based on practical rationality, considering that they analyze and experience theoretical and practical educational situations that use TDIC in basic education. However, it is considered that the expression of these subjects in the curriculum is still low compared to the sampling carried out and, except on one campus, there is no need for continuity, which would allow for deeper discussions and expansion of experiments and training experiences.

It is observed that recently updated courses, as well as those located on interdisciplinary campuses, add more favorable elements to discussions on TDIC, which allows the use of technologies not to be reduced to the acquisition of elementary, instrumental notions or those that do not have continuity.

Reasons for including TDIC in the initial training of pedagogues

For Marinho and Lobato (2008), the appropriation of TDIC during initial training is a possibility that can make a difference in building their relationship with digital technologies, reflecting on their future performance. In the same sense, Karsenti, Villeneuve and Raby (2008), argue that future teachers who have training in the pedagogical use of technologies are more likely to use them at school.

Digital technologies can act as auxiliary technical-semiotic instruments for teaching work; however, they require the appropriation of a range of knowledge for their use to be efficient. Therefore, it is considered important to encourage practices and discussions that lead to the redefinition of the bond between teachers and these technologies, providing them with a mode of use that goes beyond unintentional use, aimed at communication or leisure, but that leads them to develop a critical and pedagogically oriented look at these resources in the classroom.

Bearing in mind that the appropriation of TDIC during initial training can make a difference in the teacher's relationship with these technologies in pedagogical practice (MARINHO; LOBATO, 2008), it is necessary to pay attention to the pedagogue's initial training courses, as well as to the paradigms of teaching under which they are structured, associated with practical experiences on the school floor and opportunities for reflection, theoretical comparison, debates and restructuring of strategies.

It is considered that, although they have been gaining more expression in recent years, TDIC has still been treated as a kind of "appendix" in teacher training curricula, which leads to problematizing the consequences of this in the relationships that this teacher establishes with technologies in the classroom, in its ways of using it as a teaching tool, and in its impacts on students, who could benefit from these instruments in the face of critical and innovative education, but who end up not debating or experiencing such experiences in the classroom of class.

Returning to the research question, which sought to answer how pedagogy courses in the state of São Paulo have approached Digital Information and Communication Technologies and which pedagogical paradigms underlie the initial training of future pedagogues, the results of the documentary analysis allowed us to verify that the courses investigated seek to train up-to-date professionals, aware of social and historical dynamics and that promote transformative practices, but few initial training programs are effectively training teachers for the educational use of digital technologies in the classroom, with a view to offering mandatory and elective courses that discuss such issues.

The results indicate that both educational legislation and education researchers recognize the importance of training future pedagogues to use TDIC in the classroom, but the timid and discontinuous offer of training experiences that discuss TDIC makes deepening and integration difficult of digital instruments efficiently in the classroom. It is considered that these aspects could promote teaching that allows access and qualifies the ways in which digital instruments are used by teachers and students; however, in the current scenario, they contribute little to effective teaching updating and do little to interfere in the collective transformation of teaching practices. Furthermore, it highlights the need for curricular updates and the inclusion of this topic in debates on initial and continuing teacher training.

Final remarks

In the reflections made so far, we have been concerned with analyzing the initial training of the pedagogue under the legal and curricular panorama, discussing statements that support and structure the course curricula and that will echo in teaching, inviting reflection on the reformulation of higher education teaching courses in terms of the relationship between teaching and learning approaches and the insertion of digital technologies in pedagogue training. Therefore, we consider that the scope of these discussions is expanded, as we look at the reverberations of the initial training process for the school, in terms of pedagogical and social transformation.

Regarding the results of this research, we consider that pedagogy courses have little problematized, reflected, analyzed or investigated knowledge about Digital Information and Communication Technologies, with regard to their pedagogical use at school, which certainly impacts initial training teaching and their future practice. We understand that such a discussion is necessary, since, in addition to the technical handling of the digital instrument, pedagogical innovation consists of the integration of pedagogical paradigms, the search for updated scientific knowledge, the promotion of a motivating educational environment, critical reading that guides the appropriate selection of materials and intentionality in the use of these and other teaching aids, aspects that demand reflection, experience, discussion and collective analysis, which will form a solid training, which replaces insecurities, resistance and fear of the unknown through appropriation, creativity and innovation.

At the beginning of 2020, the world was surprised by a virus that shook all social sectors, especially health, the economy and education. The SARS-COV-19 pandemic required extreme measures from governments to minimize contagion, including social isolation, which, in the educational field, involved remote teaching.

This historical moment highlighted the inequality of access to digital instruments and the internet, the different modes of use, the uncertainties, but, above all, the collective efforts to appropriate a way of teaching and learning through digital screens, which strengthened the need incorporating discussions about TDIC during initial teacher training. On the other hand, there was a reduction in ongoing training and emergency strategies so that the educational process did not stagnate, considering that having the digital instrument does not enable the subject to use it for educational purposes, which requires knowledge and intentions.

We agree with Nóvoa (1997, p. 9) that: “there is no quality teaching, no educational reform, nor pedagogical innovation, without adequate teacher training”. Although the

integration of digital technologies in Education is a trend, teacher training, as well as universal access to digital devices and the internet, continue to be one of the steps to be reached on the ladder of quality in education, which aims at social transformation.

REFERENCES

BARDIN, J. **Análise de conteúdo**. Lisboa: Edições 70, 1977.

BRASIL. Ministério da Educação. **Parecer CNE/CP n. 3/2006**. Estabelece as Diretrizes Curriculares Nacionais do Curso de Graduação em Pedagogia. Brasília, DF: MEC, 2006. Available at: http://portal.mec.gov.br/cne/arquivos/pdf/pcp003_06.pdf. Access: 10 May 2021.

BRASIL. Conselho Nacional de Educação. **Resolução n. 2, de 1 de julho de 2015**. Estabelece as Diretrizes Curriculares Nacionais para a formação inicial em nível superior (cursos de licenciatura, cursos de formação pedagógica para graduados e cursos de segunda licenciatura) e para a formação continuada. Brasília, DF: CNE, 2015. Available at: http://portal.mec.gov.br/docman/agosto-2017-pdf/70431-res-cne-cp-002-03072015-pdf/file. Access: 04 May 2021.

BRASIL. Ministério da Educação. **Base Nacional Comum Curricular**. Brasília, DF: MEC, 2017. Available at: http://basenacionalcomum.mec.gov.br/. Access: 13 May 2021.

CASTELLS, M. **A Sociedade em Rede**. Rio de Janeiro: Editora Paz e Terra, 2018.

CHARTIER, R. Novas tecnologias e a história da cultura escrita: obra, leitura, memória e apagamento. **Revista Leitura: teoria e prática**, [*S. l.*], v. 35, n. 71, p.17-29. 2017. Available at: https://ltp.emnuvens.com.br/ltp/article/view/628. Access: 04 Apr. 2021.

GOMEZ, M. V. **Educação em rede**: Uma visão emancipadora. São Paulo: Cortez; Instituto Paulo Freire, 2004.

KARSENTI, T.; VILLENEUVE, S.; RABY C. O uso pedagógico das Tecnologias da Informação e da Comunicação na formação dos futuros docentes no Quebec. **Educação e Sociedade**, Campinas, v. 29, n. 104, p. 865-889, out. 2008. Available at: https://www.scielo.br/j/es/a/vJfwrYNGc79dbkdhPPgpdWw/. Access: 7 Mar. 2021.

KENSKI, V. M. Novas tecnologias - o redimensionamento do espaço e do tempo e os impactos no trabalho docente. **Revista Brasileira de Educação**, Rio de Janeiro, n. 8, p. 58-71, maio/ago. 1998. Available at: http://educa.fcc.org.br/scielo.php?script=sci_arttext&pid=S1413-24781998000200006. Access: 6 Mar. 2021.

KENSKI, V. M. Novas tecnologias na educação presencial e a distância. *In*: BARBOSA, R. L. L. (org.). **Formação de educadores:** desafios e perspectivas. São Paulo: Editora UNESP, 2003. p. 91-107.

LEVY, P. **Inteligência coletiva**. São Paulo: Edições Loyola, 2007.

LOPES, R. P.; FÜRKOTTER, M. Formação inicial de professores em tempos de TDIC: uma questão em aberto. **Educação em Revista**, Belo Horizonte, v.32, n.04, p. 269-296, out./dez. 2016. Available at: https://www.scielo.br/j/edur/a/n45nDkM4vvsHxGw9tgCnxph/. Access: 6 Mar. 2021.

LÜDKE, M.; ANDRÉ, M. E. D. A. **Pesquisa em educação**: abordagens qualitativas. São Paulo: EPU, 1986.

MARFIM, L.; PESCE, L. Formação do pedagogo para o uso educacional das tecnologias digitais de informação e comunicação: uma revisão de literatura (2006-2014). **Laplage em Revista**, Sorocaba, v. 3, n. 2, p. 9-23, maio/ago. 2017. Available at: https://www.redalyc.org/journal/5527/552756522003/html/. Access: 7 Mar. 2021.

MARINHO, S. P.; LOBATO, W. Tecnologias digitais na educação: desafios para a pesquisa na pós-graduação em educação. *In*. COLÓQUIO DE PESQUISA EM EDUCAÇÃO, 6., 2008, Belo Horizonte. **Anais** [...]. Belo Horizonte, 2008. p. 1-9. Available at: https://www.researchgate.net/publication/255648750_Tecnologias_digitais_na_educacao_desafios_para_a_pesquisa_na_pos-graduacao_em_educacao. Access 6 Mar. 2021.

NÓVOA, A. (org.). **Os professores e a sua formação**. Lisboa: Dom Quixote, 1997.

PÉREZ GÓMEZ, A. O pensamento prático do professor: a formação do professor como profissional reflexivo. *In*: NÓVOA, A. (org.). **Os professores e a sua formação**. Lisboa: Dom Quixote, 1997. p. 95-114.

PINO, A. Técnica e semiótica na era da informática. **Revista Contrapontos**, v. 3 n. 2, 2003. Available at: https://siaiap32.univali.br/seer/index.php/rc/article/view/725. Access: 6 Mar. 2021.

SCHÖN, D. A. Formar professores como profissionais reflexivos. *In*: NÓVOA, A. (org.). **Os professores e a sua formação**. Lisboa: Dom Quixote, 1997, p. 77-91.

SEVERINO, A. J. **Metodologia do Trabalho Científico**. 23. ed. 9. reimpr. São Paulo: Cortez, 2007.

SILVA, A. M. **Uso do computador no processo de ensino e aprendizagem**: norteadores teórico-metodológicos da prática de professores dos anos iniciais da rede municipal de São José do Rio Preto. 2011. 163 f. Dissertação (Mestrado em Educação) – Universidade Estadual Paulista. Presidente Prudente, 2011. Available at: http://www2.fct.unesp.br/pos/educacao/teses/2011/diss_analigia.pdf. Access: 6 Mar. 2021.

CRediT Author Statement

Acknowledgments: Not applicable.

Financing: Not applicable.

Conflicts of interest: There are no conflicts of interest.

Ethical approval: Not applicable.

Availability of data and material: The material is for the exclusive use of researchers; however, it can be made available upon request.

Author contributions: Data collection: Maria Carolina Branco Costa Antunes de OLIVEIRA and Viviane Cristina GARCIA DE STEFANI. Tabulation, statistical analysis and creation of figures and tables: Maria Carolina Branco Costa Antunes de OLIVEIRA. Text writing: Maria Carolina Branco Costa Antunes de OLIVEIRA. Text review and supervision: Viviane Cristina GARCIA DE STEFANI.

Processing and editing: Editora Ibero-Americana de Educação.
Review, formatting, standardization and translation.