

Discourse on technologies in public policies on education*

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Abstract

In the so-called information age, the topic of digital technologies is an integral part of educational discourse and research, which have pointed to the need for teaching methods and programmes that deal with the technological innovations of our time. With this aim, numerous investments, both public and private, have been made in order to make it feasible to incorporate digital technologies into everyday school activities. However, we noticed a need to investigate what is meant by technology within the scope of education and how this understanding influences the subject. That said, this paper proposes identifying and analysing the perceptions of technology that run through the discussion of public policies on education in Brazil. For this, we used critical discourse analysis, applied to government policy documents on education determining the parameters and guidelines for incorporating digital technologies into schools. Specifically, we opted for the analysis of the 2014-2024 National Education Plan and the Connected Education Innovation Programme, the most recent policy on the topic. We propose two analytical categories on the perceptions of technology: technical artefact and socio-cultural artefact. Lastly, we consider that, although there are references to socio-cultural views on technology in the educational field, the predominant perception relates more strongly to the aspects of technology as a technical artefact.

Keywords

Digital technologies – Public policies on education – Critical analysis of the discourse – Artefact.

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DOI: <http://dx.doi.org/10.1590/S1678-4634201945205167>
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Introduction

In the information age, faced with a scenario in which it is possible to access, learn, collaborate and exchange information through digital networks, the topic of digital technologies is an integral part of educational discourse. The contemporary educational model, the basis of which dates to the industrial age, is considered by many to be not only outdated but inherently unsuited for schooling young people. Furthermore, according to this new trend, the solution indicated for improving and developing the educational system often lies with the adoption of digital technologies.

Against this backdrop, significant challenges emerge for school education. Among the most striking in the literature is the need for schools to foster the development of essential skills necessary for citizenship in the 21st century as well as the inescapable need to exploit the potential of digital networks. In the last twenty years, what stands out is the overall effort to produce public policies aimed at increasing the use of digital technologies in daily school life, taking the form of numerous investments aimed at ensuring appropriate infrastructure for access to digital technologies and the internet, as well as teacher training and school curriculum adjustment (SELWYN, 2011). In Brazil, both public policies and specialized literature are heading towards incorporating digital technologies as a core issue relating to the development and modernization of educational systems.

As part of everyday school activities, public policies on education and scientific and academic research, there is talk about educational technologies, IT and communication technologies, digital technologies, social technologies, and new technologies, among a variety of other terms. One notices, however, a lack of discussion about what is understood by technology, a subject on which there is a myriad of differing ideas, varying according to each discussion. This realization led to this paper, which aims to analyse the discourse on public policies relating to education to identify the perceptions of technology permeating them.

The perceptions of technology in the educational field

Referring to its Greek origin, technology as a term is comprised of the word *techné*, plus the suffix *-logia*. *Techné* refers to a skill, art, or craft, while *-logia* relates to knowledge. Although often associated with tools, originally the word, technology, had an intrinsic relationship with the understanding and development of knowledge, beyond the idea of the processes of doing something or even of its product (MILLER, 2012; SELWYN, 2011).

In contemporary times, technology as a term has a broad definition, referring both to the way humans use tools and how they apply their knowledge to control and to adapt the environment in which they live. Today, it is observed that everyday applications of the term are associated with the social and cultural aspects of both the production and the use of these objects.

The dynamics of contemporary views on technology are often revealed based on two dichotomous approaches: the idea of technology as a tool, adaptable by the use made by humans, and the idea of technology as a shaper of culture and society, it being possible to identify the existence of at least three aspects of technology we should look at: the

physical objects themselves; the human activities that are related to these objects; and the knowledge that permeates these activities (PEIXOTO; ARAÚJO, 2012; SELWYN, 2011).

By adopting this approach, technologies are seen through the lens of their cultural bias, that is, as part of knowledge, actions, rites, and memories that are constructed and transmitted across the generations. In this way, human interactions with technological processes become fundamental elements, because it is based on them that possible transformations emerge.

In this paper, we chose to detail the visions of technology as a technical artefact and as a socio-cultural artefact to seek an initial basis of understanding for their developments and nuances. We note, however, that it is not possible to affirm the existence of only two views since each new technology carries with it implied hypotheses and varied social and cultural implications, the understanding and boundary lines of which may vary according to each subject, experience, and belief.

Technology as a technical artefact

Upon putting forward the category of technology as a technical artefact, we are faced with Miller's proposal (2012) about technological artefacts, defined based on technical-economic infrastructure of society, the use of which occurs acritically, with the pragmatic purpose of dealing with the physical environment faced by the individual. The alteration of this type of artefact occurs according to the availability of materials and technologies for its development.

This vision is interconnected with the utilitarian notion of scientific advances, based on a divisible triad of technology, society and culture, on an independent basis. As part of this division, culture is seen as the dynamics of representations; society as a set of respective actors; and technology as their artefacts. Technology is perceived as something dissociated from the human being, an autonomous force, capable of impacting culture, and society, which are considered as passive targets. There are also value judgements that allow technology to be held accountable for the results of its uses (LÉVY, 2014, 2016).

By looking at technology from the perspective of a technical artefact, one tends towards technological determinism, that is, towards seeking objective explanations of cause and effect for complex questions related to technology and society. In this scenario, the binary variable of presence/absence of technologies becomes the only one responsible for the expected change in the result. As part of this perspective lies the ideology of scientific-technological neutrality, based on which innovations are understood as autonomous entities, with predictable effects (MACHADO, 2004; PISCHETOLA, 2011, 2015, 2016).

In this scenario, when thinking about the relationship between education and digital technologies, it can be said that there is a belief that

Mere exposure to specific technologies would be able to trigger, in a specific context, the processes of growth already underway in another context, adopted as a reference. In this way, one accepts a linear vision of development and innovation, which assumes that technology is a universally beneficial form. (PISCHETOLA, 2015, p. 2).

From this perspective, one identifies the concern in schools with the number of machines, with the existence of fast connections with the Internet and with the setup of computer labs, listed as possibly revolutionary for education. The goal becomes one of equipping schools, without questioning the use of such equipment, thereby endorsing a scenario of homogeneous solutions for heterogeneous issues (BARRETO, 2012, 2017; MACHADO, 2004; PISCHETOLA, 2016; SELWYN, 2017).

Underlying this view are basic ideas not only concerning education but concerning science and economic development, such as the belief that the use of different technologies in the classroom can be disassociated from the contents of established problems; regardless of the context, technologies are viewed as a factor for speeding up development. This conception ends up tying education up with neutrality and objectivity, disregarding both ideological and methodological aspects (MACHADO, 2004; SELWYN, 2017).

In considering digital technology as a technical artefact and, in this way, bringing its use into the fold of education, one can become susceptible to judgements of a reductionist nature, with technology being overly appreciated, given its potentialities for improvements in everyday social life, or being subjected to a pejorative vision, due to stressing the dangers mistakenly considered as part of its nature (PRETTO; PINTO, 2006).

Technology as a socio-cultural artefact

One of the main elements in the interpretation of technology as a socio-cultural artefact concerns the idea that the evolution and development of artefacts reflect not only a technical and economic evolution but also the relations between the systems and the environments of which they are part. In this regard, the alterations of artefacts are the fruit of improvements in both relationships between individuals, groups, macrosystems and the environment of which they are part, together with their focus of interest (MILLER, 2012).

Based on this perspective, technological developments are understood as an intrinsic part of the evolution of the human being and their socio-cultural actions. Viewed in this way, technology extrapolates the ideals of villain or heroine, taking the form of yet another human manifestation, and, as it alters its technologies, it is also altered by them.

The understanding of culture appears here in line with the perception of Heinsfeld and Pischetola (2017), interpreting culture as the symbolic value given by societies to certain objects, beliefs and experiences. This symbolic value is constituted through processes of social signification and re-signification. In this way, culture is everything that is established by action in society - experiences, production, interactions with other beings and objects, beliefs, and values -, as these actions (re-)produce meanings and provide (re-)signification.

Based on this interpretation, it is possible to imagine that social and cultural aspects lie behind technologies, taking the form of actions and reactions linked to ideas, projects, and ideologies. In this regard, a specific technology cannot be seen as positive or negative, even neutral, since it can only be analysed in its contexts.

Technology, as such, is understood as a socio-cultural artefact, a product of human needs, which transforms these needs. In the words of Bannell et al. (2016, p. 67).

Technologies are, therefore, cultural artefacts, a product of cultural needs. Through the development and deployment of artefacts that embody intentions and desires, human beings gain control over their needs. Artefacts become mediators of human relations with the world and enhance cognitive abilities upon acting as technical and psychological tools.

Perceiving technologies as culture means seeing them as going far beyond the description of what they are, thereby encompassing why they are and what their uses are, to understanding them as not only material and functional objects and practices, but also as symbolic and aesthetic. As such, both their significance and potential data originate from wider-ranging cultural spaces. Its incorporation into schools moves towards dialoguing with the particular context, and that considered primordial concerning the incorporation of digital technologies into the classroom shifts from the technical and operational capability to the engagement in meaningful social practices (LÉVY, 2016; PISCHETOLA, 2016; SILVERSTONE, 2014).

Visions for technology in public policies on education

In this paper, we analyse documents concerning public policies on education in force, the subject matter of which relates to the adoption of digital technologies in basic education, namely the 2014-2024 National Education Plan (BRASIL, 2014b), Law 13.005/2014 (BRASIL, 2014a) and the Connected Education Innovation Programme, Decree nº 9.204/2017 (BRASIL, 2017a).

It is understood that such debates do not arise in a social vacuum, being continually guided by their interpretive contexts. In this way, critical discourse analysis (CDA) was chosen as a theoretical and methodological inspiration, the focus of which lies in the relationship between language and the social world, thereby investigating the presentation, approbation, and criticism of the reality that permeates discourses. Under CDA, discourse is a social practice, understood as the fruit of the interconnections of various social elements, such as actions, relations, objects and instruments, historical and temporal context and the social subjects themselves, with their beliefs, knowledge, and values. All these elements are related in a dialectical way: although different, they do not present themselves in a distinct and disconnected way, each internalizing in some ways aspects of the other (BARRETO, 2012, 2017; FAIRCLOUGH, 1989, 1995, 2008; LUKE, 1995; WODAK, 2004).

The production, processing, and analysis of the data followed these steps: i) survey and selection of documents of indicative relevance for the analysis, according to the established scope; ii) critical analysis of the discourse of the listed texts, based on the already detailed perceptions of technology: technical artefact and socio-cultural artefact. On this basis, the analytical trajectory followed the linguistic clues identified in the documents. As a point of entry to the texts, their semantic aspects were used, based on the implicit aspects and the presuppositions that can be taken as the foundation of

these discursive practices. In this way, we tried highlighting the passages that, although seeming transparent or neutral upon first reading, featured already naturalized, veiled meanings (BARRETO, 2017).

Below we have highlighted some excerpts, the nuances of which have been relevant to this understanding. We stress that the presented extracts do not cover all the policy texts or clues identified.

2014-2024 National Education Plan

The 2014-2024 National Education Plan (PNE 2014-2024) (BRASIL, 2014a), established by Law 13.005/2014, is a planning document from the educational sector guiding the development of public policies on education for a decade. As a result of intense debates, it is the second National Education Plan already approved by law in Brazil, being a reference for public and State action (BRASIL, 2014b).

Upon analysing the perceptions of technology found in the 2014-2024 PNE document (BRASIL, 2014a), it can be summarized that the strategies mapped out with regard to technologies focus on certain factors:

- development, selection, diffusion and incorporation of pedagogical technologies and educational technologies in the school routine;
- encouragement of continuing teacher training and the participation of students in scientific and technological courses;
- computerization of schools and universal access to the Internet.

Although there are references to teaching issues, one perceives that technologies are portrayed in the document as strategic tools in order to be able to achieve the established goals, featuring greater dialogue with a perception of technology closer to that of a technical artefact.

With regard to the development, selection, dissemination, and incorporation of educational and teaching technologies, the following excerpts stand out:

[...] *develop teaching technologies combining, in a structured way, the organization of time and learning activities between schools and the community environment*, considering the specificities of special education, rural schools, and indigenous and maroon communities. (BRASIL, 2014a, p. 4, highlighting added).

[...] *select, certify and disseminate educational technologies for children's literacy*, ensuring the diversity of methods and teaching proposals, as well as monitoring the results in the education systems in which they are applied, preferably to be made available as open educational resources. (BRASIL, 2014a, p. 6, highlighting added).

[...] *foster the development of educational technologies and innovative teaching practices that ensure literacy* and stimulate the improvement of school flows and the learning of students, considering the different methodological approaches and their effectiveness. (BRASIL, 2014a, p. 6, highlighting added).

[...] *encourage the development, selection, certification and dissemination of educational technologies for early childhood education, primary education and secondary education* and to encourage innovative teaching practices that ensure the improvement of school flows and learning, ensuring the diversity of methods and teaching proposals, with preference for free software and open educational resources, as well as the monitoring of the results in the education systems in which they are applied. (BRASIL, 2014a, p. 8, highlighting added).

Although, at first glance, they may look like snippets of transparent language, the excerpts in question concern more opaque issues in the discourse. For example, one notices a distinction between teaching technologies and educational technologies, which is not clarified in the document. One infers the importance given to technologies, associated with methodological innovation, although largely focused solely on literacy, one of the policy goals. This is an interesting concern with the way in which technologies are inserted into the school context but limited to what may be considered as teaching use. This limitation opens room for multiple interpretations, given the existence of divergence in interpretations about what are teaching uses of digital technologies, as pointed out by Heinsfeld and Pischetola (2017) and Pischetola and Heinsfeld (2018), who highlight the influence of these divergences on the discourses of teachers of basic education.

As for the impetus on the participation of young people in courses on technological areas, we highlight here two sections that indicate the valuing of scientific-technological careers, to the detriment of the other qualification possibilities:

[...] *stimulate the participation of teenagers in courses on technological and scientific areas.* (BRASIL, 2014a, p. 4, highlighting added).

[...] implement technological capacity building programmes for the young and adult population, targeting segments with low levels of formal schooling and students with disabilities, interconnecting the educational systems, the Federal Network of Professional, Scientific and Technological Education, universities, cooperatives and associations, through extension activities undertaken at technological vocational centres, with supporting technologies fostering the effective social and productive inclusion of this population. (BRASIL, 2014a, p. 9, highlighting added).

This type of reinforcement points to the favouring of strategies that corroborate certain desired social scenarios (RAMOS; HEINSFELD, 2017). There is the appreciation of knowledge that seems to lead to modern production, emphasizing the ideal of technology associated with development and progress, in a utilitarian way.

Another important implicit aspect concerns the term, technological capacity building, used to refer to segments with low levels of formal schooling. The use of the term capacity building, when it comes to the young and adults in schooling, contrasts with other occurrences in similar contexts, which are accompanied by the word training when the subject is the teachers. Capacity building means making someone capable of something, which presupposes their inability. As such, the inability to interact with digital technologies is associated with young people and adults who rarely attended formal

education institutions, despite being widely known that these subjects have contact with such technologies in their daily lives. Once again, one questions what types of uses of digital technologies are sought to be instructed to this population in capacity building.

The promotion and encouragement of continuing teacher training in schools, including the training and application of innovative teaching practices, also appears as one of the policy strategies:

[...] promote and stimulate initial and continuing teacher training for children's literacy, *with knowledge of new educational technologies and innovative teaching practices*, stimulating interconnection between graduate certificate programmes and continuing teacher training for literacy. (BRASIL, 2014a, p. 6, highlighting added).

The teacher training and refresher movement is greatly desired when taking the socio-cultural perspective of technologies as a starting point. However, one observes once again the restriction of this support to literacy only. This delimitation may be related to a technical perspective, in search of a homogeneous tool solution for a given problem, from the perspective that it is enough to train teachers to use such specific technologies to solve the illiteracy issue. It reinforces the belief that, when the results are not satisfactory, the way forward is the more efficient use of these technologies, in this way capitulating to results-based teaching (BARRETO, 2017), linked to determinism and instrumental rationality, characteristic of the perception of technology as a technical artefact.

In order to achieve Goal 7 of the 2014-2024 PNE, which refers to the increase in the quality of basic education, three strategies regarding access to technological equipment in schools have been listed:

[...] *achieve, by the fifth year of effectiveness of this PNE, universal access to high-speed broadband internet and triple by the end of the decade computer-student ratios in the public-school system of basic education, by promoting the use of ICT in teaching.* (BRASIL, 2014a, p. 8, highlighting added).

[...] *provide digital technological equipment and resources for use in teaching at all public basic education schools*, including creating mechanisms for the implementation of the necessary conditions for universal access to libraries at educational institutions with access to digital computer networks, including the Internet. (BRASIL, 2014a, p. 8, highlighting added).

[...] *fully computerize the management of public schools and departments of education in the States, Federal District and Municipalities*, as well as maintain a national programme for initial and continuing training for the technical staff of departments of education. (BRASIL, 2014a, p. 8, highlighting added).

Concern about the availability and access to equipment in the highlighted sections is necessary, but not enough to ensure learning and fruitful use of these technologies. There is a recurrent tendency of seeing computerization and access to digital equipment

as enough to ensure any improvements in the educational system. This is a reductionist view, according to which mere exposure to technologies seems capable of guaranteeing the desired results. Priority is given to the dissemination of digitalization instead of incorporating it into practices (BARRETO, 2012; PISCHETOLA, 2011, 2015, 2016; PRETTO; PINTO, 2006).

In short, it is possible to infer that digital technologies are portrayed in the 2014-2014 PNE (BRASIL, 2014a) as tools for achieving the outlined goals, without concern for critical and reflective in-depth analysis of the role of these technologies at schools. One has an indication of its incorporation into teaching, a strategy that is reinforced on several occasions, mainly regarding literacy. However, the document does not have a solid goal for its incorporation into all basic education, thereby seeking to bring the school reality closer to society and culture, which seem foreign to schools. In this policy, the understanding of digital technologies is mainly based on the perspective of a technical artefact. Knowledge of technology prevails over the understanding of meaning.

Connected Education Innovation Programme

Established on 23 November 2017 through Decree no. 9204, the Connected Education Innovation Programme (BRASIL, 2017a) is one of the updates concerning education policies focused on digital technologies in education, seeking to put into practice strategy 7.15 of the 2014-2024 PNE (BRASIL, 2014a), with a view to combining efforts to ensure that these technologies are incorporated into daily school activities. This strategy consists of

[...] *providing universal access* to the high-speed broadband internet by the fifth year of effectiveness of this PNE and, by the end of the decade, *tripling the computer-student ratio* at public basic education schools, by promoting the use of ICT in teaching. (BRASIL, 2014a, p. 8, highlighting added).

The decree constitutes the most recent government policy on the subject and complementary to other already established policies.

Looking back at how technology is perceived in the text of the Connected Education Innovation Programme (BRASIL, 2017a), it is possible to identify two areas of greater concern: a) ensuring infrastructure considered suitable for expanding Internet access; b) introducing digital technologies as teaching tools at schools.

Returning to the analysis of 2014-2024 PNE, although there is concern about practice considered by the document as instructional methods in relation to digital technologies, the policy is established on the basis of access and the computer/student ratio, which appear first in the text. The focus on physical access to devices, instead of questioning the relationship between technology and society, represents the historical continuity of education policies based on the belief that access alone is capable of guaranteeing inclusion, as well as reinforcing the perspective of technological determinism, the viewpoint entailing the ideology of scientific and technological supremacy, with technologies seen as the only factors responsible for socio-economic development. As such, homogeneous solutions to

heterogeneous issues of different pedagogical, epistemic, and methodological natures are endorsed (BARRETO, 2012; MACHADO, 2004; PISCHETOLA, 2011, 2015, 2016).

The concern with the use of technologies in teaching, in turn, does not appear tied to a description of what would be considered as a pedagogical use. This absence lends itself to interpretations on the part of the reader, with the possibility of either valuing the potentialities of their various uses, including their socio-cultural relations or limiting this understanding to already traditionally consolidated practices, without any questioning. The constant inclusion of expressions such as the use of technology in teaching and technology as a teaching tool acts to delineate not only which technologies are appropriate for the classroom, but which uses are considered appropriate. Although not described in the document, this delimitation indicates the existence of the pre-determination of which uses are understood as capable of enabling learning and the production of new knowledge, regardless of the context of respective application.

Upon analysing Decree no. 9.204/2017, one notices that the wording of the goal set out in the Programme is similar to that of the aforementioned 2014-2024 PNE strategy (BRASIL, 2014a):

Art. 1 - The Connected Education Innovation Programme is hereby established, in accordance with strategy 7.15 of the National Education Plan, approved by Law 13,005, of 25 June 2014, with the *goal of supporting universal access to high-speed Internet and fostering the use of digital technologies in teaching* as part of basic education. (BRASIL, 2017a).

In addition to the goal established in the decree, the Programme Guidelines document (BRASIL, 2017b) adds a goal focused on *access* to digital technologies.

Provide universal access at schools to digital platforms and tools by 2024 and make access to high-quality broadband available for 22,400 public schools by 2018. (BRASIL, 2017a, p. 7, highlighting added).

Once again, it is worth highlighting the use of the term, *access*, a lexical choice designating externality. The choice of this word in a context tying technology with education suggests a detachment from the process, thereby minimizing the importance of the subject in this scenario and establishing the condition of the given product, which needs only be accessed to benefit from its fruits (BARRETO, 2017; PISCHETOLA, 2016).

The Connected Education Innovation Programme aims to combine efforts to “ensure that necessary conditions are created for the inclusion of technology as a teaching tool for daily activities at public basic education schools” (BRASIL, 2017a, Art. 2, highlighting added). The use of the word *tool*, once again, refers back to the perception of technology as a technical artefact, in a manner acritical of and decontextualizing the socio-cultural scenario in which it is placed. It is understood that what is needed for incorporating technology into teaching mainly concerns access to equipment, as recommended in the principles governing the programme, listed in Art. 3 of the Decree (BRASIL, 2017a). Of the nine principles listed, one relates to economy and issues of speed and efficiency (I), one

to collaboration between states (IV), four to access to equipment and resources (II, III, VII, and VIII), one to student autonomy (VII) and two to the teacher (V and IX), featuring this same approach quantitatively.

Throughout the text, there are mainly aspects related to access, equipment and what is understood as necessary for the use of technology in teaching, in the form of high-speed internet connections and computer network infrastructure. Out of the twelve responsibilities of the Ministry of Education set out in the document (BRASIL, 2017a), seven relate to infrastructure, connection speed, parameters and diagnostics concerning the adequacy of equipment (I, II, V, VI, VII, XI and XII), while five relate to teaching issues (III, IV, VIII, IX, and X).

However, the same scenario is not perceived in relation to the seven actions listed as responsibilities of the programme, listed in Art. 4 of the decree. Out of the seven actions, three relate to technical and infrastructure support (I, II, and V), while four relate to teacher training and the development of digital teaching resources (III, IV, VI, and VII).

The inversion of the priorities of actions, favouring, at least quantitatively, teaching issues, points to a re-signification shift in perceptions concerning digital technologies and their potentialities, encompassing socio-cultural aspects inherent to their possible applications. However, once again, the use of the word, tool, is highlighted, characterizing the application of technologies in the teaching context. The use of this term, as already detailed, identifies the perception of technology as a technical artefact, in the form of use defined based on the available technical and economic structure, in an acritical manner, aimed at the direct solution of a problem of a pragmatic nature (MILLER, 2012).

Going further in the investigation, we return to the Programme Guidelines document (BRASIL, 2017b), to clarify certain issues related to the decree. Among them, there is a list of the four dimensions based on which the programme should be implemented, namely: a) vision; b) training; c) digital educational resources; and d) infrastructure.

Regarding the vision of the programme, the text of the guidelines states:

The Vision dimension is the guiding principle of the Programme and should foster, in states and municipalities, innovation and technology planning as *transforming elements of education*, promoting values such as quality, contemporaneity, management improvement, and equity, in the Vision Dimension. (BRASIL, 2017a, p. 9, highlighting added).

In the passage, there is the description of the vision of technology as transforming education. In addition to a close relationship with a deterministic view, there is a shift from technology to the subject of action in the wording: technology that is capable of transforming education, instead of the relationship between the uses applied by actors in the educational and learning process and their relationship with their society and culture. In this way, these actors are not just deprived of action, but there is also a simplification and reductionism concerning training processes (BARRETO, 2017).

The incorporation of this vision as one of the basic dimensions of the policy indicates that the intended training of teachers and other facilitators of the programme will be according to this perspective, as illustrated in another section of the guidelines text on the

continuing training of programme facilitators, which indicates that teacher training will be based on the dimensions of “vision, training, educational resources and infrastructure” and topics on the use of technology for teaching in schools (BRASIL, 2017b, p. 12).

Although there is an indication of the publication of references to what is understood as ‘use in teaching’, according to Art. 4 of the document, that proposed can take different routes: either towards orientation and critical training concerning the process of teaching and learning mediated by digital technologies; otherwise towards restricting what is considered as an acceptable and valid use of these technologies in the school context. It should be emphasized that in order for digital technologies to be re-signified and understood as socio-cultural artefacts, it is not only necessary for this perspective to appear in the texts on policies, but also for teachers and students to understand them in this way.

Art. 14 of the Decree (BRASIL, 2017a) specifies that the incorporation of the use of digital technologies into teaching practice is the responsibility of each school and it must dialogue with each teaching policy project, thereby valuing and guaranteeing the autonomy of institutions and their teachers.

Although this measure guarantees autonomy for each school to adapt requirements to its reality, it also allows each institution to apply varying interpretations about the role of technology. It is a double-edged sword. The absence of definitions and a priori guidance about what is understood in this policy as pedagogical use of technologies makes each school responsible for these actions. On the other hand, the intention to publish references in the future indicates the existence of a pre-determined delimitation of these uses, considered as plausible and possible for schools, this leading to the possibility of curbing other daily uses by subjects.

In addition, the text of the decree clarifies how this policy should be considered by the Ministry of Science, Technology, Innovations and Communications, with emphasis on it being a policy for expanding telecommunications infrastructure and digital inclusion, a delimitation that includes per se the policy’s initiative in terms of status as a tool, as set forth in Art. 11 (BRASIL, 2017a).

There is, as such, the predominance of the perception of digital technologies as technical artefacts. No direct or indirect mention is made of the socio-cultural aspects involving the development and uses of digital technologies, whether in the world of work or of studies.

Final considerations

In the overall socio-cultural panorama, significantly implicated by political and economic changes resulting from the transformations brought about by a new media environment, it is essential for schools to redefine their teaching perspective based on the values of citizen participation in society, much more so than imparting operational skills or seeking to prepare young people for the technical demands of the world of work.

In this research, we sought to analyse and understand the perceptions of technology that permeate the discourses of public policies on education. One can summarize that critical perspectives, interpreting technologies as socio-cultural artefacts, are

overshadowed by the concern with quantitative access statistics, together with what is meant by the use of these technologies in teaching, thereby restricting what is considered appropriate in education.

In the 2014-2024 PNE document (BRASIL, 2014a), one can note that they are portrayed mostly as strategic tools to reach the goals set for the programme, with no general concern with a critical and reflective in-depth analysis of their role. This is due to the tendency to interpret computerization and access to digital equipment as enough to ensure improvements in the educational system.

With regard to the Connected Education Innovation Programme (BRASIL, 2017a), we highlight the attempt to measure the nuances about what it means to innovate in teaching and the use of digital technologies in teaching. Such attempts reduce the teaching and learning process to its quantitative aspects, with the external and observable dimensions of complex social relationships in schools being the object to be measured. We note the mention of the publication of references to define what is considered as the use of technologies in teaching. As already emphasized, it is possible to look at this publication proposal from two antagonistic perspectives: as a proposal to guide and encourage critical analysis undertaken by professionals involved in the process of teaching and learning or as a possibility for restricting that interpreted as an acceptable and desirable use in the school context.

The explicit indication of the programme as an initiative within the scope of policies for expanding telecommunications infrastructure is of great relevance for understanding this perception. Although there is, at a given moment in the text, a favouring of teaching issues, which points to a re-signification shift for digital technologies and their potentialities, there is a predominant perception of digital technologies as technical artefacts, tools. No mention is noticed of the socio-cultural aspects involved in the development and application of digital technologies in the educational context or even in the world of work. As such, the incorporation of digital technologies in these policies “[...] does not have the meaning of opening up possibilities, in the plural, but rather standardization of the constituent elements of the teaching process” (BARRETO, 2017, p. 136).

It should be noted that in both texts there is some concern about the participation of school, students, and teachers in this new social scenario. However, it is technical and utilitarian: focused on equipping schools with technological equipment, technically empowering young people for the world of work and promoting the use and consumption of digital educational content. Policies are decontextualized from the daily activities of students and teachers and from their routine relationship with such technologies.

We return to the regulatory and classificatory capacity of institutionalized discourses. As already pointed out, from this perspective, everyday discourses can define social representations, making them appear naturalized, common sense (LUKE, 1995; WODAK, 2004). The minor presence of potential references towards socio-cultural aspects indicates the naturalization of technology as responsible for achieving the expected results as an entity dissociated from its relations with the actors involved in the educational process (LÉVY, 2014, 2016; MACHADO, 2004; PISCHETOLA, 2011, 2015, 2016).

The issue of the commercialization and business exploitation of educational policies is presented as a possible explanation for the gap between perceptions of technology found in the texts. The existence of several bodies at the time of drafting these policies points to an ideological dispute, which goes beyond what is expressed in the wording. This ideological dispute results in the educational model described in the documents, which naturalizes certain social aspects that extrapolate its discursive nature and dialogue with economic and market-related issues, such as the overvaluation of scientific and technological careers, standardized assessments, professional training and actual role of technology, often presented as the subject of educational action.

This points towards the understanding of technology as a socio-cultural artefact. The idea that there are homogeneous solutions appropriate to all kinds of contexts is as fallacious as the notion that the mere existence of digital technologies in everyday school activities is enough to improve educational experiences automatically and independently. The result of the waves of technological innovations about to save education in the last fifty years seems to point to the same outcome: from radio to cinema, from VHS to DVD, from computer labs to smartphones, education has shown itself to be largely untransformed and non-disruptive. This is because technologies alone cannot deal with issues as complex as those that affecting education. Behind each non-transformation and non-disruption there are implied, distinct pedagogical, epistemic and ideological conceptions, related to each historical-social context, which require critical research.

Of course, equipping schools with technological resources helps in the systematic work of incorporating digital technologies into teaching practices. However, the discrepancy between the relevance given to guaranteeing access to such equipment and other listed nuances, such as teacher training, points to the devaluation of practices. It should be remembered that the ideological cornerstone of deterministic thinking in this scenario is the idea that technology is autonomous, capable of establishing itself, and that mere exposure to technology is enough to trigger the expected effects. More than that, as we observed in the documents, the expected effects commonly emphasize the instrumental nature of technology, which is the core point set out in in this paper.

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Received on: 25.06.2018

Approved on: 10.09.2018

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