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Geography teaching in times of digital technology hegemony[1]

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ABSTRACT

This paper aims to analyze geography teaching in times of hegemony of digital technologies and the strong presence of the so-called online education. Focusing on this theme we made an effort to answer, even if in a provisional and flexible way, the following questions: Which critical issues permeate the geography teaching context marked by intense interaction between teaching practices and digital media and technologies? What is the interference of this process in the geography teachers' work? These guiding questions are analyzed based on the theoretical background in the education field, digital media and geography teaching. We sought to develop the investigation with an eye on the inferences built up in the research field, and the observation of the current movement around the school, educational processes, and geography teaching, all of them marked by online interactions and the variety of digital educacional resources.

KEYWORDS: Geography teaching. Digital technologies. Teaching practices.

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O ensino de Geografia em tempos de hegemonia das tecnologias digitais

RESUMO

O presente ensaio tem como objetivo central analisar o ensino de geografia em tempos de hegemonia das tecnologias digitais e da forte presença da chamada educação *online*. Frente a essa temática envidamos esforços para responder de forma provisória e flexível as seguintes indagações: Que questões críticas se interpõem ao contexto pedagógico da geografia marcado pelo cruzamento intenso entre práticas ensino e as mídias e tecnologias digitais? Quais são as interposições desse processo no trabalho do docente de geografia? Essas questões orientadoras são analisadas tendo como referência um esboço teórico do campo da educação, das mídias digitais e do ensino de geografia. Procuramos balizar as indagações com inferências construídas no campo da pesquisa e das observações do movimento atual em torno da escola, dos processos formativos e do ensino de geografia, todos eles marcados pela vida *online* e pela profusão de recursos educacionais digitais.

PALAVRAS-CHAVE: Ensino de Geografia. Tecnologias digitais. Práticas docentes.

La enseñanza de la Geografía en tiempos de hegemonía de las tecnologías digitales

RESUMEN

El objetivo principal de este ensayo es analizar la enseñanza de la geografía en tiempos de hegemonía de las tecnologías digitales y de fuerte presencia de la llamada educación en línea. Frente a este tema, nos esforzamos por responder de manera provisional y flexible a las siguientes preguntas: ¿Qué preguntas críticas se interponen en el contexto pedagógico de la geografía marcado por la intensa intersección entre las prácticas docentes y los medios y tecnologías digitales? ¿Cuáles son las interposiciones de este proceso en el trabajo del profesor de geografía? Estas preguntas orientadoras se analizan con referencia a un esquema teórico del campo de la educación, los medios digitales y la enseñanza de la geografía. Buscamos orientar las indagaciones con inferencias construidas en el campo de la investigación y observaciones del movimiento actual en torno a la

escuela, los procesos formativos y la enseñanza de la geografía, todos ellos marcados por la vida en línea y la profusión de recursos educativos digitales.

PALABRAS CLAVE: Enseñanza de la Geografía. Tecnologías digitales. Prácticas docentes.

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Antes de existir computador existia tevê/ antes de existir tevê existia luz elétrica/ antes de existir luz elétrica existia bicicleta/ antes de existir bicicleta existia enciclopédia/ antes de existir enciclopédia existia alfabeto/ antes de existir alfabeto existia a voz/ antes de existir a voz existia o silêncio/ o silêncio...

Arnaldo Antunes

Introduction

Geography teaching plays a relevant role in the learners' education. This subject, found in school curricula in several countries since the XIX century, aims to work with students to enlarge their geographical horizons and understanding of the world we live in. Such education process is mediated by teachers, who should ideally master a teaching concept and the contents to be taught, and keep a cultural repertoire to support their education practice developed at schools.

Traditional teaching practices, focusing on memorization and description rather than explanation and critical reflection, have been rethought for not being able to qualify learners in a satisfactory way for the current context, which is marked by unequal social and economic relationships, and an information and communication process that has modified the relationships between places, people, and the world. The globalized world has experienced the advent of fast and fluid connections,

which certainly produce other ways of developing geography teaching and, consequently, other educational needs for these teachers.

In such context, there is a growing awareness of the relevance of digital, information, and communication technologies to create learning possibilities and motivate students to learn actively, becoming protagonists of their learning processes. In this society permeated by information networks, students are increasingly led to access the internet, select the most relevant information, and share knowledge with others in a collaborative way.

The appearance of technological resources and broadened access to the internet resulted in the development of cyberculture and cyberspace[5], which has seriously affected geography teaching and learning. In fact, we could observe that "all knowledge areas have been affected, either directly or indirectly by the development of digital technologies, regarding both their knowledge production process and the way such technologies interfere in the promotion of scientific and school production in these areas" (ARRUDA; MILL, 2021, p. 6).

Thus, teachers' teaching practice has been noticeably affected by the emergence of the access and use of digital resources in the classroom, which requires different teaching methodologies that might cooperate with the teaching-learning process in this context. Among the possibilities listed, the digital educational resources (DER) appear, in this field they are "understood as any digital resources that can be used in the education scenery" (CHECHINEL, 2017, p. 6), and that allow the construction of a geography teaching that is more connected to technological possibilities and aligned to the students' desires.

Taking that into consideration, this study aimed to analyze geography teaching in times of predominance of digital technologies and broadening of

[5] "The term [cyberspace] specifies not only the material infrastructure of digital communication but also the oceanic information universe it harbors, as well as the human beings who navigate and nurture this universe. As for the neologism 'cyberculture', in this work it refers to the set of (material and intelectual) techniques: practices, attitudes, modes of thinking, and values that have developed alongside the growth of cyberspace" (LÉVY, 1999, p. 17).

online education. Focusing on this theme, we made an effort to answer, even if in a provisional and flexible way, the following questions: Which critical issues permeate the geography teaching context marked by intense interaction between teaching practices and digital media and technologies? What is the interference of this process in the geography teachers' work?

Times of hegemony of the digital technologies

Children and young people are social subjects with needs, demands, and rights. They are individuals with the right to education secured by the Federal Constitution of 1988 (BRASIL, 1988), and confirmed by the Lei de Diretrizes e Bases da Educação Nacional – LDBEN (National Law of Guidelines and Bases for Education) n. 9394 (BRASIL, 1996). Children and young people are, therefore, subjects of right and the education has to guarantee their full development as citizens.

In such context, schools are the place where children meet and develop social and collective interaction, educational actions, and learning. It is a place of belonging, affections and subjective exchanges through which students build up relationships and deal with the knowledge acquisition process, produce culture, and become active in society. Schools are not separated from society, on the contrary, they are the venue where individuals meet the "other", become aware of diversities, and the need to respect such differences. They are also a place of knowledge and learning pursuit.

Thinking about children and young people, their right to learn, and a relevant social coexistence is a quite complex task. It means to think about specific conditions for human development and also social arrangements that challenge the contemporary schools to persevere in the construction of meaningful educational activities, whose background includes the needs, particularities, and potentialities of the learners in their educational process.

One of the challenges faced by schools is to think about the impact of digital and information and communication technologies on the learners' sociocultural configuration. Such challenge is imposed to all school subjects and the schools' *modus operandi*.

The constant interactions and productive process mediated by human work modify the geographical space and society as a whole. It seems relevant to emphasize that the transformations occurred over time have been intense, and among the most recent, we can highlight globalization, which resulted in an integration of people, companies, and places at an international scale. Our society is in constant change, which also affects the ways of teaching and learning, since education is impacted by and also contributes to these social transformations.

Such substantial change in productive processes provokes alterations in the constitution of the global space and its organization, resulting in a technical-scientific-informational environment, as pointed out by Milton Santos (1997). Currently, significant changes have been observed in productive processes, work environments, and culture. At the same time, substantial alterations have been witnessed in the communication and transportation networks, making the world more connected and unified. In such context, the first sketches of what was named cyberspace appeared. Lévy stated in the late 1990s that "the emergence of cyberspace will most likely have – already has had- as radical an effect on the pragmatics of communication as the discovery of writing" (LÉVY, 1999, p. 113-114).

It seems relevant to highlight that with the appearance of the computer world network and the greater integration between people and places, several new words and meanings appeared that sought to know and explain these new spaces. Cyberculture is defined by Pierre Lévy as "a set of (material and intelectual) techniques: practices, attitudes, modes of thinking, and values that have developed alongside the growth of cyberspace" (LÉVY, 1999, p. 17). The cyberculture expansion occurred

mainly due to the technological progress that started to enable interactive digital devices as mass consumption products.

Thus, it seems relevant to mention that the online environment became possible from the appearance of computers and the internet and, mainly, the personal computer, which enabled greater access of the indiduals to the network. Therefore, a space is produced from the advancement of information and communication digital technologies and, as a consequence of that, changes in the social arrangements, social perceptions, lifestyles, and ways of producing and disseminating knowledge occurred.

According to Silva (2013, p. 36), the term cyberspace started to be used in the most diverse areas of knowledge in relation to the conceptual space of information and communication digital technologies, associated with service systems controlled by computers. According to Lévy (1999, p. 17), "the term specifies not only the material infrastructure of digital communication but also the oceanic information universe it harbors, as well as the human beings who navigate and nurture this universe".

Therefore, cyberspace is understood as the space that results from communicability created by individuals to interact by the use of computers connected in a network. Pires (2016) highlights that

> Cyberspace as a technical-political dimension of territory, or an articulated territorial complex of socio-technical networks in connection and in continuous expansion or, as defended by the American activists in a more pragmatic way, a complex "interdependent network of information technology infrastructures' (PIRES, 2016, p. 17).

Regarding the web use, we can point out that ubiquous communication through mobile devices (smarphones), as well as the creation of digital platforms were fundamental to promote a radical change in lifestyle and education processes in contemporary society. The convergence of media occurred gradually, since they include multiple interaction resources via the

internet, which allow instant access to distinct interfaces. “In the world of media convergence, every important story gets told, every brand gets sold, every consumer gets courted across multiple media platforms.” (JENKINS, 2009, p. 29). That author also pointed out that

> This circulation of media content - across different media systems, competing media economies, and national borders - depends heavily on the active participation of the consumer. I will argue here against the idea that convergence can be understood primarily as a technological process - the bringing together of multiple media functions within the same gadgets and devices. Instead, I want to argue that convergence represents a shift in cultural logic, whereby consumers are encouraged to seek out new information and make connections between dispersed media content (JENKINS, 2009, p. 29-30).

“Connection” became a word full of symbolism in a society interconnected by digital networks. While people use internet networks and the connections enabled by it entering the cyberspace, the convergence becomes even broader. As stated by Jenkins (2009, p. 30) “Convergence does not occur through media appliances - however sophisticated they may become. Convergence occurs within the brains of individual consumers, and in their social interactions with others”.

The idea defended by Levy in the early 2000s seems to have been only partly confirmed. According to that author, “all the elements of cyberspace will continue to advance toward integration, interconnection, and the establishment of increasingly interdependent systems that are universal and transparent” (LÉVY, 1999, p. 113). Currently, the digital environment has been seen to have flooded all aspects of social life. It has enabled the access of documents, images, and varied media with different contents and historical moments. In addition to accessing these resources,

they can also be shared in several ways using the network and its tools. That author's optimistic view was surely reviewed in relation to the power of capitalist conglomerates and the use of algorithms in a society articulated by the digital context.

Thus, we could notice that the cyberspace keeps and inseparable bond with zonal space and the production relations it establishes, in addition to lifestyles and all transformations crated by the humankind. The idea of "real space" and "virtual space" started to be questioned, since this separation does not account for a social and special order analysis.

The online and offline life is one only. Thus, a broad and umbilical interaction is seen between doing, producing, seeing, and speaking in the digital environment and zonal space, as well as in the use and management of the internet resources, the cyberspace environment, and the cyberculture that results from these relationships. In such context, the role of school education is challenging. On the one hand, it is not possible to keep a teaching model oblivious to the existing changes. On the other hand, it is still hard to build up a critical and creative process for the use of the information network, permeated by the convergence of media and online platforms. The resources made available by the cyberspace and that can ge used by teachers from pre-school to higher education are countless and cater for all subjects. However, managing the excess, with the necessary search for and selection of content, and possibility of access are also important challenges posed to teachers.

Critical questioning of education and digital connectivity

An optimistic view in relation to this expansion and individuals' participatioin in networks currently seem not to raise great confidence and positivity as the ideas defended by Levy (1999) and many other authors that relied on the horizontal communicability enabled by technologies and the space/time reconfiguration of society. Castells (2003) pointed out that the end

of geography announced by the new social morphology inaugurated by digital networks was seen to be questionable:

> The internet era was considered the end of geography. In fact, the internet has its own geography, a geography made of networks and knots that process information flows generated and managed from places. Since the unit is the network, the architecture, and the dynamics of multiple networks are the sources of meaning and function of each space. The resulting flow space is a new form of space, characteristic of the information era, but it is not deprived of place: it connects places through telecommunicated computer networks and computerized transport systems. It redefines distances, but does not cancel geography. New territorial configurations emerge from processes incessantly elaborated by the variable geometry of global information flows (CASTELLS, 2003, p. 170).

The difficulty to analyze more deeply the social and cultural implications related to the digital network connectivity results from the fact that constant transformations occur in the informational technical medium, which make its dominance unstable. The impregnation of activities linked to the digital environment has become proeminent in society and, currently, it is possible to state that it would be difficult to analyze certain cultural, economic, and social aspects without the presence of digital technologies, since they are part of the daily life in society.

Thus, the growth of the discussion about the power of entrepreneurial conglomerates that dominate the market and provoke substantial changes in several sectors of society has been witnessed, motivated by the inauguration of the so-called capitalism based on digital platforms. According to D'Andréa (2020), the world today is dominated by large technology companies, the so-called Big Techs:

> One aspect that consolidates and singles out the idea of 'online platform' is the growin adoption of a computer architecture based on connectivity and data interchange. Based on robust infrastructures – in general named 'cloud' servers -, platforms have consolidated from a centralized model of information and financial flows. (D'ANDRÉA, 2020, p. 14)

The companies that dominate the digital market accumulated huge power in the sense of controlling activities that directly impact commerce, social relationships, transport, data storage, and even politics, and election results in different countries. It seems relevant to recall some names that express the symbolic and economic dominance of these hegemonic corporations in the early XXI century: Alphabet-Google, Amazon, Apple, Facebook, You Tube, Microsoft, Amazon, Uber, etc. The power of such conglomerates has raised concern, made concrete in infrastructure services, and centralization of daily activities and strategies for societies, economies, and global politics. As pointed out by D'Andréa (2020, p. 13), "influences in electoral processes, irrestrict use of personal data with commercial purposes, and the use of algorithms and data bases to perpetuate prejudice and inequalities are some of the issues that, have increasingly concerned governments, companies and civil society".

Surely, investments in more critical analysis perspectives are needed, so that, mainly in the education field, they can measure the influence of cyberculture and digital connectivity in the citizens' education and life in society. It is also necessary to question our faith in technology, technophily, and dependence on the benefits of technology. Raising critical awareness of the "digital capitalism" or "platform capitalism" in several sectors, including the education area, is also urgent.

Schools have sought to become computerized so that learners can access digital contents. In this process, according to Selwyn (2017), it is advisable to question the premise that guides us toward the narrative about

the technology ability to improve education, without ignoring the fact that technology in education also represents a multimillionaire market and the imposition of private companies in public education. The author pointed out:

> Philantropic foundations, transnational corporations, risk capitalists, and other "edu-entrepreneurs" keep investing quite a lot of time and funds, and attempts to 'fix' or 'disturb' with technological media our school and university systems, allegedly 'broken'. The 'solutions' presented include promises of 'personalization', game-based learning, 'inverted classrooms', 'builder's culture', 'XXI century skills' etc. Innovations and interventions as these might be desired and beneficial; however, they certainly require supported critical examination. Many of the 'new' digital education ways have been currently promoted due to commercial interests and are, undoubtely, founded on agendas and ideologies that are quite different from the ones we are used to seeing in public education. These changes in tone and emphasis might be a 'good thing', or not. However, these are issues that demand better recognition, debate and scrutinity by critical observers and commentators (SELWYN, 2017, p. 100).

The search for pedagogical renewal is, in general, based on an attempt to insert several technological resources in the teaching practices. However, it is necessary to keep a critical perspecteive in relation to the adoption of technologies in schools, since they cannot become a panacea for the solution of educational problems. The society digitalization impact has had important repercussions in the education sector and imply the need to discuss technology, capital and power concentration in the hands of entrepreneurial corporations that use data with commercial purposes.

Certainly, by using digital resources, teachers have sought the possibility of improving their learners' participation and learning results. In such context, we can verify the proeminence of cyberspace and the offer of countless possibilities of resources within it. In this sense, for school use, we can highlight the use of digital educational resources. Freitas (2007, p. 21) explained that educational resources are "all and any resources used in a teaching procedure, aiming to stimulate students and getting them closer to the content to be learnt". Thus, it seems relevant to point out that digital resources are relevant mediators in the knowledge construction process, including in relation to geographical knowledge.

Regarding digital resources, they can be defined as "an item that is availabe on the Web, in digital format: images, videos, audios, animations, simulations, games, and texts, among others" (BRITO *et al.*, 2016, p. 5). From the moment a digital resource starts to be used with educational purposes seeking students' learning onwards, it starts to be classified as a digital educational resource.

Therefore, we can observe that digital educational resources (DER) comprise not only materials that were designed with the educational environment in mind, they can include all kinds of digital resources that might be used in an educational context. A report, for instance, published in a digital journal and made available to the broader audience, can be used in geography classes to introduce or complement a certain theme. Thus, any digital resource might become a DER, depending on the way it is used by the teacher, aiming to build up knowledge.

The digital environment undoubtedly offers a wide variety of digital educational resources for the teaching practice seeking to improve students' learning. Their great risk in the contemporary world is the mystification of such resources, when they are considered the solution to education problems. As pointed out by Barreto (2017, p. 127), technological resources "tend to be placed in a position of agency, as if they were the subject of the formulations. Assuming that CIT originated

from a 'revolution' and can lead to others, they become the focus to be analyzed". Thus, technology might be ascribed a biased view of 'salvation', as the saviour of education. Certainly, it is not the technical dimension that will solve education problems and technological gadgets cannot reach the position of subjects. The education experience must be central in the discussion about education and technology.

To conclude: Geography teaching and digital technological resources

Therefore, as the discussion about digital technologies challenges education, it certainly also challenges geography teaching. Geography enables the exploration of multiple skills that the students already have and can help them to understand the world. According to Cavalcanti (1998, p. 24):

> The purpose of teaching geography to children and young individuals must be exactly to help them form more articulated and deeper reasoning and conceptions about space. This means to lead students to think facts and events as constituted of multiple determinants; to think facts and events considering several explanations, depending on the interaction of these determinants, including space.

This implies that the current role of geography should be the critical and creative use of several methodological resources so that learners can develop a critical view of the complexity and dynamics of the current world. Therefore, computational resources and the Web are integral part of this process.

"Students and teachers are inserted in turbulent waves of information, technologies, languages, texts, and visual arrangements" (Almeida and Guimarães, 2021, p. 22) and geography seeks to educate citizens that are critical and aware of their functions in society and in the construction of the geographical space. In such context, learners must

develop spatial reasoning that can contribute to their understanding of the world through geographical analysis. Thus, geography teaching in the initial years of elementary school aims to develop the possibility of interpreting the geographical space. As pointed out by Moraes (2012, p. 1), the first objective of geography as an area of study "is to help people to understand the world where they live. This is the goal, at the same time simple and ambitious, deep and specific: to help people locate themselves, to offer people knowledge that will enable them to understand the places where they are inserted and the broader world. Thus, meeting this basic requirement of understanding the world is the greatest challenge of geography in schools and, therefore, of the geography teachers.

The objective of this subject is to teach learners to think about and relate their reality with the world where they live in. Therefore, it is necessary to develop skills that lead learners to understand and analyze each content worked, not in isolation, but in the context of the interdependence of geographical scales, from local to global. Studying it might help to optimize their understanding of their place in the world, and how people interact with other individuals around them. It seeks to qualify a critical individual for the exercise of citizenship.

Thus, the discussion of topics such as ethics, democracy, respect to the others and cultural, political, religious differences, as well as other themes must be considered. Teachers should mediate lessons that contribute to the development of learners' potentials such as criticism and creativity.

Students must take part in knowledge production and geographical reasoning, by doing/thinking space. It is relevant to study the reality where the learners are inserted, since by understanding it, they can realize that space is built and such local and regional production processes occur due to people's actions. In this way, more distant issues and places can also be studied and they have the chance to develop their own learning aided by the educator's mediation. Learners can also

understand their reality critically, realizing how society works, since "building up the idea of space in its cultural, economic, environmental, and social dimensions is a huge challenge posed to geography, and school geography" (CASTELLAR, 2005, p. 211).

The methodological work requires the composition of languages and resources. Certainly, the current technological conditions have transformed the classroom in a space/time that mixes online and offline. One space is constantly influencing the other, which makes the classroom an environment "at the same time territorialized, deterritorialized, and reterritorialized. This creates a new geographical metalanguage, since the concrete space remains a condition *sine qua non* for the life to happen in its several fronts and struggles" (CAZETTA; GONÇALVES, 2021, p. 338).

Having access to geographical information about the world is not enough, being able to interpret and analyze it is necessary, as well as understand how the immersion in the digital environment has reconfigured social relations and the space/time notions. As pointed out by Gomes:

> Geography is the field of studies that interprets the reasons why different things are located in different positions, or why diverse spatial situations can explain different qualities of objects, things, people, and phenomena. It is a way of building up questions, that is, the curiosity to know to which extent the positioning system can be an explanatory element (GOMES, 2017, p. 20).

Thus, we can hypothesize, raise questions, analyze them, and explain them. The amount of information found in geography classes goes beyond the borders of the classroom to give access to different spaces. This leads us to think about the interdependence of geographical scales (local, regional, national, global) and the relationships created between human

beings and digital environments. This is another challenging task posed to geography teaching, as set forth in the National Common Curriculum "to analyze the social, cultural, digital, and the technical-scientific-informational environments based on human sciences, considering their different meanings in time and space, to interfere in routine situations and position the individual when facing the contemporary world problems" (BRASIL, 2018, p. 357).

We also understand that digital technologies impose new ways of organizing the education of children that were born in a globalized world marked by intense information and communication flows. Teachers have to respond to this context in a more critical and creative way and, in this way, analyze the organization and contents of the platforms that produce and disseminate knowledge for children. Currently, this is a fundamental task. Thus, teachers play a relevant role in the education research field, since, as pointed out by Rui Canário (2019, p. 238):

> [...] teachers have the responsibility of imagining education devices and routes that lead to learning through experience and permanent inquiry, through the continuous exercise of creativity and citizenship. Curiosity is the ultimate foundation of an array of educational opportunities. To the professional educator, I would say that respect to the learners must guide the whole education activity. Learners education is always necessarily unfinished. They must learn through their own experimentation and reflection (CANÁRIO, 2019, p. 283).

Therefore, thinking about the use of digital materials and resources to teach geography involves several aspects and, particularly, the constant inquiry about how this geography is configured with technologies and digital media, which constantly seek to teach children

and young individuals the characteristics and issues related to the contemporary world.

This results in a challenging path, and a geography to be reflected upon, reconfigured, and built up in the education field.

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