



## Technology and Subjectivity: Social Representations of Digital Technologies shared in coping with the Covid-19 pandemic

## Tecnologia e Subjetividade: Representações Sociais de Tecnologias Digitais compartilhadas no enfrentamento à pandemia da Covid-19

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### ABSTRACT

The research aimed to identify social representations of digital information and communication technologies shared by undergraduate students in pedagogy, permeated by the context of the pandemic in their initial formation. Due to its cognitive and subjective character, the theoretical field that supports the study is the Theory of Social Representations. The qualitative research methodology used the Technique of Free Association of Hierarchical Words (ABRIC, 2005), a collection strategy that conditions the respondents to a hierarchy of terms based on their importance in the representation of this group. The results presented the internet, the computer, the cell phone and innovation as possible components of the central core of the social representation shared by the group of students, while the difficulty, learning, distance learning, adaptation, education, resource, access, connection, tools, Google Meet, Google Classroom, challenge and inequality figure in the field of the periphery of this representation. In addition, the production and reproduction of these social representations would be linked to moments of tension, little connection with technologies, distance and social inequality.

### RESUMO

A pesquisa teve por objetivo identificar representações sociais de tecnologias digitais da informação e comunicação compartilhadas por licenciandos/as em pedagogia, perpassados/as pelo contexto da pandemia em sua formação inicial. Por seu caráter cognitivo e subjetivo o campo teórico que ampara o estudo é a Teoria das Representações Sociais. A metodologia da pesquisa, de caráter qualitativo, utilizou a Técnica de Associação Livre de Palavras Hierarquizadas (ABRIC, 2005), estratégia de recolha que condiciona os/as respondentes a uma hierarquização dos termos a partir da sua importância na representação deste grupo. Os resultados apresentaram a internet, o computador, o celular e a inovação como possíveis componentes do núcleo central da representação social compartilhada pelo grupo de estudantes, enquanto a dificuldade, aprendizagem, distance learning, adaptação, educação, recurso, acesso, conexão, ferramentas, Google Meet, Google Classroom, desafio e desigualdade figuram no campo da periferia desta representação. Além disso, a produção e reprodução dessas representações sociais estaria vinculada a momentos de tensão, pouca conexão com tecnologias, distância e desigualdade social.

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## **Introduction**

The outbreak of the global state of global pandemic, announced by the WHO in March 2020, due to the emergence and mass spread of the Covid-19 virus, culminated in the suspension of face-to-face activities in various segments, subjecting society to social distancing measures that led to the expansion of the use of digital information and communication technologies (TDIC) on an emergency basis. This phenomenon has also affected educational institutions at all levels and modalities.

In Brazil, colleges and universities were surprised by the pandemic event and abruptly migrated their classrooms to virtual spaces, adopting the Remote Teaching modality emergency.

Both from the point of view of common sense, as from the scientific point of view, the phenomenon, due to its dimension, intends to have an impact still unknown about the use of these technological resources in the routine of undergraduate students, since their homes began to host their space of academic formation, passing through their way of seeing, thinking and acting in the course of their initial formation.

In the midst of so many unexpected transformations, this research highlights the relevance of understanding the way in which undergraduates of a public university located in the state of Pernambuco reflect socially on Digital Technologies and Remote Teaching during their graduation in the Degree in Pedagogy, since they were also surprised by the digital wave for almost two years. Thus, it seeks to reflect subjective and social aspects that permeate the thinking of these pedagogues in training about the object of social representation Digital Technologies of Information and Communication (TDIC).

Therefore, the central question of this study aims to understand what social representations are shared by undergraduate students in pedagogy about digital technologies in coping with the Covid-19 pandemic in relation to education? In what context have these representations been produced?

Such questions are urgently needed, especially in the face of the pandemic moment that has compelled these students to continue their initial training during one of the greatest health crises experienced by humanity. Thus, the research aims to identify the social representations of digital information and communication technologies shared by undergraduate students in pedagogy, permeated by the context of the pandemic in their initial formation.

The article intends to contribute scientifically through the identification of the social representations of the undergraduates, believing that this path makes it possible to guide teacher training, since it allows the understanding and direction that pedagogy students project to their professional future and to the future of their future students (Souza et al., 2014).

In time, the moment of pandemic crisis becomes opportune, since the experiences and the expressive expansion in practices with TDIC have been directly influencing educational formative processes during and possibly even after the pandemic period (Alvez, 2020).

## **Theoretical framework**

Considering the contemporary society increasingly connected, the use of technologies has been discussed, expanded and disseminated in recent decades as something common in people's daily lives. The current scenario, surrounded by technological interventions, as well as the Internet and all new media resources has become key positions in the transformation of man (Levy, 1999). In the same way, in the human sciences, in particular, the field of education, also gradually begins to rethink theoretical and methodological strategies from the insertion of digital and media resources, although it's a long and continuous path, which follows slow steps.

However, with the advent of public calamity promoted by the Covid-19 Virus Pandemic, it has become pressing, emerging and necessary to advance significantly with regard to the use of these technologies in teaching, given that the disease caused social distancing and coerced students and teachers to experience, almost compulsorily, classes in remote format through digital media.

At this moment and given the need to maintain, in some way, the teaching practices in Brazil, emerged, in the midst of the Covid-19 Pandemic, the Emergency Remote Teaching, which can be defined as an emergency educational strategy. The strategy was authorized by the Ministry of Education, from which, exceptionally, face-to-face classes were replaced by virtual classes, with the use of digital educational resources and communication technologies.

To meet the demand, universities sought to adapt to sudden and emerging changes, so digital platforms were adapted for pedagogical uses, some programs stood out in the 'replacement' of classrooms by digital spaces, for example: Google Meet, Zoom Meeting, Google Class Room, WhatsApp, the internet and technologies have become the main form of mediation of learning between students and teachers in the midst of emergency remote teaching.

It's important to discern Distance Education from Remote Learning. Since the second, contextualized in the pandemic emerges as a purpose of significant change in the pedagogical paths, beyond a didactic organization never experienced (Salvagni, 2020), and we add: unplanned, discussed or thought from its critical and exclusionary context. In this bias, a hastily formulated didactic proposal seems to disregard the fact that "it's necessary that educational institutions and their students have preparation, pedagogical, human and technological conditions" (Camacho et al., 2020, p. 10), different from distance learning.

Distance education in Brazil is regulated by Decree No. 9057/2017, of the Ministry of Education, a document that describes it as an educational modality in which didactic-pedagogical mediation occurs through means and technologies, with qualified professionals, access policies, monitoring and evaluation compatible with its specificities. On the other hand, remote teaching does not have such infrastructures, being a complex phenomenon that draws

the attention of researchers around the world, in search of unveiling factors that surrounded the remote experience in the use of media technologies by teachers and students in their training process.

This research considers fruitful the field of investigation that surrounds the initial training of teachers, with emphasis on pedagogues, since these are mostly the future drivers of learning in basic education in Brazil. Analyzing the technological phenomenon and its crossing in the training of undergraduates, especially in the midst of the crisis, becomes extremely important because, according to Tardif “teachers also refer to shared social knowledge, as members of the same social world. They highlight knowledge and collective ways of being, as well as diverse knowledge of work shared among peers” (Tardif, 2012, p. 61). For the author, it’s essential to discuss the relationships between knowledge and the life and learning history of the pre-professional period of teachers to mobilize improvements in their daily practice and solve situations and problems of the teaching practice of teachers in office.

Because of their potential to participate in this process of reframing that interferes in the future practice of these teachers, the massive use of technologies during the pandemic compels us to seek to understand how this experience has been felt, reflected and shared. For this analysis, the theoretical field of social representations grounds us, given its contextual and subjective character, since social representation “participates in the establishment of a vision of reality common to a given social set” (Jodelet, 1991, p. 668). Through theory it becomes possible to overcome the dichotomy of psychological and sociological approaches, articulating psychological and social concepts (Jodelet, 2014), in this attempt, through the theory of social representations one can understand how a group appropriates a social object and collectively reelaborates its value and meaning. This action allows the elaboration of guidelines, justifications and practices in relation to this object (Abric, 1994).

The structural approach of the theoretical field explains that social representation has a set of organized elements with specific functions, in which the elements of the central core zone play the role of guiding practices and generating meaning to social representation, corresponding to a more solid and consensual component or idea, while the other elements, occupy the periphery zone and dialogue with the context, the changes and also correspond to possible individual modulations of the subjects' thinking (Abric, 1994).

Thus, the SRT can be thought of as a lens capable of perceiving the way in which the phenomena of social representations are constituted and integrate the justifications and social practices of individuals, also enabling the apprehension, analysis and understanding of their structure.

Godoi et al. state that:

studying the relationships between educational technologies, teachers and students is a space for the field of study of social representations. We clearly identified the

relationship between subject and object, teachers/students and educational technologies, respectively. This relationship needs to be objectified and the anchoring of these representations, needs to be analyzed and later communicated, so as to be evidenced and be critically analyzed (Godoi et al., 2018, p. 350).

Through this way, through the theory of social representations, the research proposes to understand how the crossing of digital technologies has been in the academic life of undergraduate students in Pedagogy, identifying the relationships that are established between their initial training and their way of seeing, appropriating and reflecting the use of media tools in educational spaces, considering the pandemic context in which these representations have been constituted.

### **Methodology**

The research is characterized by a qualitative approach, in view of its purpose in apprehending relations and meanings attributed to a given social phenomenon. According to Flick “qualitative research participants are expected to answer these questions spontaneously and in their own words” (Flick, 2009, p. 23).

For data collection, a questionnaire with Free Association of Hierarchical Words was applied, through an online electronic form, Google Forms with 254 undergraduate students in Pedagogy of the Federal University of Pernambuco, available for completion from April 6, 2021 to June 9, 2021. The instrument, according to Abric (2005) allows, in addition to the identification of the explicit content in the social representation, access to its structure, making it possible to ascertain more frequent terms in the subjects' speeches, including those highlighted for being more important, in this process, the participant himself makes the distinction of relevance of the evocations.

The questionnaire included two stages: in the first one we sought to outline the profile of the participants, age, gender, campus and survey on socioeconomic factors. Next, the inducing term 'digital technologies in education' was presented, requesting that the respondent write the first five words that came to his head, organize them in order of relevance and justify the reason why the first word was considered the most important. Following the ethical precepts, the request for assent of participation was used through the agreement of the Free and Informed Consent Form.

Data analysis was supported by the software *Iramuteq*<sup>1</sup>, for the organization, definition of minimum frequency of words to identify the most salient elements of social representation.

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<sup>1</sup>It's not presented in this article the tables with the prototypical analysis performed by the software.

## Results

The study collected data from 254 undergraduate students in Pedagogy at UFPE, of whom 189 (74.4%) are enrolled in the institution's headquarters and 65 (25.6%) in the Agreste campus. Of this quantity, a total of 64 students (25.2%) are in the 1<sup>st</sup> period of the course, followed by the percentages: 13.4% in the 2<sup>nd</sup> period, 18.1% in the 3<sup>rd</sup> period, 3.5% in the 4<sup>th</sup> period, 7.1% in the 5<sup>th</sup> period, 5.9% in the 6<sup>th</sup> period; 6.3% in the 7<sup>th</sup> period; 5.9% in the 8<sup>th</sup> period; 9.8% in the 9<sup>th</sup> period and 4.7% in the 10<sup>th</sup> period. Regarding gender: 206 (81.1%) are female, 43 (16.9%) male, 1 (0.4%) intersex; 1 (0.4%) transvestite and 3 (1.2%) would prefer not to identify themselves regarding gender.

For the induction 'Digital Technologies in education' focus on evoked 1241 words, of these, 312 are different words and 184 appeared only once in data collection. With the support of the Iramuteq Software it was possible to define a minimum frequency through statistical calculations for analysis, so the evoked words would need to have appeared at least seven (7) times to be considered conducive to analysis in this research section. Thus, through this excerpt, a total of fifty-one (51) terms were obtained, shown in table 1.

**Table 1** - Words associated with Digital Technologies in Education with minimum frequency 7 (n = 51).

<b>Word</b>	<b>Frequency</b>	<b>Word</b>	<b>Frequency</b>
<b>Internet</b>	88	Opportunity	10
<b>Computer</b>	85	Need	10
<b>Cell phone</b>	51	Remote learning	10
<b>Inovation</b>	40	Practicality	9
<b>Distance learning</b>	30	New	9
<b>Difficulty</b>	30	Game	9
<b>Learning</b>	25	Information	9
<b>Accessibility</b>	21	Challenge	9
<b>Enabler</b>	20	Knowledge	9
<b>Advance</b>	19	App	9
<b>Google Meet</b>	18	Technology	8
<b>Adaptation</b>	18	Social media	8
<b>Access</b>	18	Network	8
<b>Google Classroom</b>	17	Computer science	8

<b>Inclusion</b>	15	Google	8
<b>Education</b>	15	Future	8
<b>Tool</b>	14	Evolution	8
<b>Possibility</b>	13	Remote class	8
<b>Remote</b>	12	Teacher	7
<b>Resource</b>	12	PDF	7
<b>Connection</b>	12	Modernization	7
<b>Communication</b>	12	Inequality	7
<b>Teaching</b>	11	Development	7
<b>Dynamics</b>	11	Creativity	7
<b>Tablet</b>	10	Timeliness	7
<b>Platform</b>	10		

*Note: Survey data, 2022.*

Table 1 shows 51 words associated with induction 'Digital Technologies in Education' in descending order. Analyzing the evocations from the frequency of apparitions collected through the technique of free association with hierarchization is configured in a means for apprehending social representations, because examining this quantification of the evoked terms makes possible an approximation to the content of the social representation and to the elements that stand out in the social thought of the investigated group (Abric, 2005).

The first word, Internet, appears 88 times and the second, Computer 85, leading the ranking of frequency of evocations, while the Mobile appears with 51 appearances, all in an expressive quantity. It's known that analyzing only the quantity of terms does not subsidize the centrality of the elements in the core of social representation, however, as studying the relations that surround technologies and education is also an epistemological field of the theory of social representations (Godoi et al., 2018, p. 250), the initial findings are incorporated into the results of other research anchored to SRT. This is the case of the investigation conducted by Rocha (2009), later Silva (2015) and Oliveira and Marinho (2020).

The terms highlighted by their high frequency Internet, Computer and Cell Phone, inferred by this study as possible central elements of the social representation of TDIC shared by undergraduate students in Pedagogy, were also apprehended as part of the core of social representation in the research of Rocha (2009). In his investigation, the author proposes the computer, the cell phone and the internet as components of the central nucleus of the object New Information and Communication Technologies (NTIC), suggesting that these are generating elements in the representation, in his research, the social representation of students on ICT indicate new forms of relationship with knowledge and learning, significantly interfering both in their residential/family spaces and in their own spaces the practice of education, thus culminating new learning times (Rocha, 2009).

Similarly, we understand that these are also currently, in the context of pandemic and remote teaching, propelling and guiding elements of social practices in the group with regard to the use of technologies in their initial formation, however, this factor is not consecrated as an event of the pandemic, because it's perceived by the research of Rocha (2009) that technologies had already been present for more than a decade resignifying learning spaces, having as elements of these new pedagogical-technological constructions primarily the internet, the computer and the cell phone. Nevertheless, there are other elements in the course of the article that may be emerging due to the pandemic moment and will be pointed out later, however, they are considered here part of the periphery of representation because they are more susceptible to contextual change (Abric, 1994).

Following the frequency analysis, Innovation is perceived with a significant volume of appearances (40), in the same way, Innovation was present in investigations that penetrated the structure of the Social Representation of the DICTIC object, being considered as a possible component of the Central Nucleus by Silva (2015) and Oliveira and Marinho (2020). Participant 102 of this study, when justifying the importance of the word innovation, suggests that “[...] digital technologies can be considered a great innovation” (Silva, 2015, p. 102).

The term distance education (30) appears with the same number of calls as the Difficulty (30), while Learning (25) also surrounds the representation of these subjects. This relationship that has brought together distance learning, learning and Teaching (11), Remote (12), leads us to infer that the emergency remote teaching modality may be at this moment being confused with Distance Education, because both are concretized through technologies in virtual spaces, however, they are different teaching practices. The distance learning considers through its policies, methodologies and strategies the construction of knowledge for non-face-to-face teaching, among other means it uses virtual learning environments elaborated in collaborative spaces in which figures such as the teacher and the tutor mediate learning through interactivity (Camacho et al., 2020), on the other hand, remote learning was proposed and imposed, without prior preparation, causing little known challenges.

The analysis of the quantification of the content of the representation associated with the justifications put forward by the set of students suggests that the difficulty (30) is both related to the need for adaptation (18) to education (15) mediated by these technologies, and the lack of resources (12) to have access (18) or connection (12) with the internet (88) and other tools (14) of Distance Education (30) such as google meet (18), google classroom (17), tablet (10), platform (10), PDF (7) and others. Note the technology intertwined at this time in specific to platforms, applications, and means of conducting remote teaching, the only path perceived as possible for learning by the group, during the crisis of distancing.

These terms are important components extracted from the content of the representation and are characterized more by the peripheral zone, since they are flexible contents, more open to contextual changes and therefore to the state of calamity experienced in the pandemic. These



elements reflect meanings that refer to remote teaching, Covid-19 and the difficulties of studying in the moment of crisis, for this reason, are part of a more living universe of representation, because they have intrinsic relations with the practices related to the object (Abric, 1994).

The content collected on the periphery of representation impels us to agree with Camacho et al. (2020) since making available disciplines in a virtual format in an unrestricted way without considering important aspects of both technological knowledge and conditions of access to resources and the internet puts at risk the teaching proposal in a responsible way in a critical pandemic scenario, in addition to the above “as a result, students throughout the country complain about the learning conditions” (Salvagni et al., 2020) is what can be observed by the presence of other words such as Challenge (9), Inequality (7).

The apprehensions put into reflection the environment in which technologies were imposed in the initial training of these students and can impact their teaching practice, whose practices quickly began to require from teachers and students an intensive use of TDIC and undoubtedly caused difficulties and generated several disorders (Oliveira; Marine, 2020).

For Souza et al. (2014) apprehending social representations in relation to teacher education allows identifying the vision that undergraduate students have of teaching, their own training, the professional future and the future of their students. This is the high point in the analysis of these representations, since the training of teachers and the knowledge inherent to the teaching practice are fruits of the exchange between the subjects in the construction and reconstruction of pedagogical didactic meanings both in the formation and in the lived experiences (Tardif, 2002), thus, the pandemic crisis has been a driver of tense and worrying experiences due to the exposure and imposition of technological tools and distance between teachers and students. This is considered by the study the context in which the production and reproduction of these social representations is linked, moments of tension, little connection with technologies, distance and inequality.

In addition, it's perceived that the didactic transposition itself from the face-to-face to the virtual, a practice existing in distance learning, did not occur in Remote Teaching, even because it's something complex, because the “[...] didactic transposition implies that the teacher is able to make the necessary transformations to the teaching and learning process, whether of the resources to be used, or of the knowledge itself” (Monteiro, 2020, p. 8). This complexity evolves as there has been no teacher training or prior planning for remote teaching practices.

Therefore, the analysis of the content of the social representation has shown the internet, the computer, the cell phone and innovation as possible components of the central core of the representation of the group of students of pedagogy for TDIC, as difficulty, learning, distance learning, adaptation, education, resource, access, connection, tools, Google Meet, Google Classroom, challenge and others figure in the field of the periphery considering that

they are modifiable, flexible and amenable to change, as they are “linked to the collective history and to the system of values and norms of the social group [...]” (Abric, 1994, p. 23).

### **Final considerations**

This investigation aimed to identify social representations of digital information and communication technologies shared by undergraduate students in pedagogy, permeated by the context of the pandemic in their initial formation.

Anchoring the theory of social representations, the study can evidence, analyzing its representational content, that the computer, the cell phone, the internet and innovation are possible components of the zone of the central core of the representation of this group, accompanied by modulating and responsive elements to changes in social dynamics, such as: difficulty, learning, distance learning, adaptation, education, resource, access, connection, tools, challenge and others.

The evocations lead us to believe that the pandemic is consecrated as a driver of exhausting experiences by the forced exposure to digital tools and distancing between teachers and students, in addition to the lack of technological resources, making the group realize the technologies based on remote teaching and virtual classes. In this thinking, the field of elaboration of the social representations of the group of students is linked to distance, difficulty and need for adaptation.

The findings presented here are far from pointing out certainties or exhausting the discussions about the formation of pedagogues and TDIC. Our reflections approach the subjectivities that surround the sharing of social representations of a set of students succumbed to technology in a timely manner. We rely only on the words evoked by the students, printed by the physical and mental exhaustion brought by the greatest health crisis ever experienced in the history of humanity, however, we believe that these reflections are capable of promoting spaces for debate, in which technology can be discussed from its potentialities, with less stigma and more needs listed on public policies, resources and training for students and teachers. Another aspect that we ponder is the relevance of rethinking the way in which these media resources have been proposed in discussions in the initial and continuing education programs of teachers in Brazil.

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