ALTERIDAD
REVISTA DE EDUCACIÓN
p-ISSN:1390-325X / e-ISSN:1390-8642
http://alteridad.ups.edu.ec

january-june 2019
Vol. 14, No. 1, 12-24
https://doi.org/10.17163/alt.v14n1.2019.01

The meaning that teachers give to the integration of digital technologies in their teaching practices

Significado que los docentes le dan a la integración de tecnologías digitales en sus prácticas docentes

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Received: 2018-01-09 / **Reviewed**: 2018-10-17 /**Accepted:** 2018-11-07 / **Published:** 2019-01-01

Abstract

This scientific paper reports an exploratory study conducted in the form of an action research and sought to identify the meanings of a teacher about the incorporation of Digital Information and Communication Technologies (DICT) / cyberspace in their pedagogical practices. Due to this purpose, we also sought to understand how these resources can be meaningful to the teaching practice in cyberculture, potentializing and instrumentalizing participatory / collaborative strategies. The intervention and data collection actions involved a teacher and her students from two classes of the 6th year of primary education in a school in the interior of Minas Gerais, Brazil. The field incursions were carried out in traditional spaces of place and cyberspace, with observations, monitoring of virtualized productions and a semi-structured interview with the teacher. The compilation of empirical data was performed in Atlas.ti software, which assisted in structuring a Content Analysis. The analytical systematization indicated that there are few Educational Public Policies for the inclusion of the DICT in the school, precarious support of infrastructure and lack of pedagogical support that guides the teachers in activities with those technologies. Another expressive suggestion was that the intervention in the field of research consolidated a moment of unprecedentedness, causing a cultural impact on the pedagogical use of DICT. Finally, the actions of authorship in cyberspace suggested learning gains and signs of reconfiguration of the student's posture towards the teaching proposals, which favored the beginning of a process of revision of pedagogical beliefs of the teacher collaborating the research.

Keywords: Teachers meanings, Digital Information and Communication Technologies, pedagogical practice, cyberculture, cyberspace.

Suggested form of citing: de Lima, M. R., & Moreira de Andrade, I. (2019). The meaning that teachers give to the integration of digital technologies in their teaching practices. *Alteridad, 14*(1), 12-24. https://doi.org/10.17163/alt.v14n1.2019.01.

Resumen

Este trabajo tuvo carácter exploratorio, configuró una investigación-acción y buscó identificar conceptos de una profesora en cuanto a la incorporación de las Tecnologías Digitales de Información y Comunicación (DICT)/ciberespacio en sus prácticas pedagógicas. Debido a este propósito, se buscó, también, comprender cómo esos recursos pueden ser significativos en la práctica docente en la cibercultura, potencializando e instrumentalizando estrategias participativas/colaborativas. La base teórica de este estudio dice respecto a la cibercultura y sus desdoblamientos en la educación. Las acciones intervencionistas y de recolección de datos involucran a una profesora y a los alumnos de dos aulas de 6º año de Enseño Fundamental en una escuela del interior de Minas Gerais, Brasil. Las incursiones en el campo abarcarán espacios tradicionales de lugar y ciberespacio, habiendo sido realizadas observaciones, acompañamiento de producciones virtualizadas y una entrevista semiestructurada con la profesora colaboradora de la investigación. La compilación de los datos empíricos fue realizada en el software Atlas.ti, lo cual auxilió en el proceso de tratamiento, relacionamiento e inferencias que compusieron un Análisis de Contenido. La sistematización analítica indicó la existencia de pocas Políticas Públicas Educacionales enfocadas hacia la inclusión de las DICT en la escuela investigada, constatándose el precario soporte de infraestructura y la inexistencia de apoyo pedagógico para la orientación de los docentes en actividades con aquellas tecnologías. Notablemente, la intervención realizada en el campo de la investigación consolidó un momento de originalidad para los involucrados, ocasionando un impacto cultural docente en el uso pedagógico de las DICT. Al final, acciones de autoría en el ciberespacio sugirieron ganancias en el aprendizaje e indicios de reconfiguraciones de la postura estudiantil frente a las propuestas de enseñanza, lo que favoreció el inicio de un proceso de revisión de las creencias pedagógicas de la profesora colaboradora de la investigación.

Descriptores: Significaciones docentes, Tecnologías Digitales de Información y Comunicación, práctica pedagógica, cibercultura, ciberespacio.

1. Introduction

The social appropriation of Digital Information and Communication Technologies (DICT) indicates a new modus vivendi in which the ease of access to virtualized information, authorship and communication in telematic networks potentiates the forms of knowledge production and reconfigures human action. This creative and expansive movement of possibilities, of (re) thinking or "doing" and the forms of social interaction end up pointing to new habits and modification of behaviors by establishing cyberculture (Lévy, 1999).

This scenario - although not yet total[1] - shows that digital technologies assume a significant place as mediators of activities, constituting themselves as a contemporary dimension of culture (Pinto, 2005). Consequently, the social appropriation of the DICT brings "[...] with its representations not only in daily life, but, also, in what refers to the forms and possibilities of academic learning" (Moraes & Lima, 2018, p. 300). In that sense, "you cannot think of the school as an oppressed instance of society and its cultural, political and economic dimensions" (Souza & Schneider, 2016, p. 421). Education needs to integrate into cyberculture and accompany its dynamics of sociocultural renewal, knowing that it is included and promoting (cyber) inclusion.

However, it is important to record that the DICTs do not determine - on their own - changes in the educational environment. We understand these technologies as conditioning factors of eventual transformations, when they are used in a way to stimulate the dialogical, reflective, creative, cognitive and affective potentials of the subjects involved. Our thinking is reflected in Santaella (2013), who indicates that the way to produce/acquire knowledge in cyberculture, when associated with education, can lead to continuous learning and ubiquitous communication. In this way, we consider that the first moment of approaching the education of cyberculture goes through the equipping of its teaching and learning spaces. However, we emphasize the fundamental nature of this initiative: the indispensable renewal of pedagogical intentionality and its adaptation to cyberculture.

In this sense, the educational reconfiguration with the integration of the DICT must go beyond the paradigm of pedagogy based on the transmission of contents for memorization and repetition (Freire, 2005). And, in tune with other researchers (Bonilla, 2009, Medeiros, 2011, Silva, 2010), we assume the use of the DICT in educational processes in a way that breaks with the utilitarian paradigm or adoption of technologies for the modernization of the traditional model. On the other hand, if cyberculture establishes an inter-relationship between digital technologies and the social modus operandi, we assume that the pedagogical practice with DICT can potentiate interactive actions mediated in cyberspace, which encourage student production individually and collectively in the web (Passarelli, 2017).

For this, it is essential that the teacher - through initial and continuing training - be able to appropriate the DICTs in a way that makes their practice compatible in the context of cyberculture, integrating themselves into a "process of human and of educational change, [which does not mean the] substitution of methods, modalities and techniques [...]" (Almeida, 2004, p.28). On the other hand, Ally and Prieto-Blázquez (2014) confirm the outdated educational model and teacher training through the advent of the DICT. Consequently, these authors indicate that such processes need to be reinvented to be more effective against the interpositions of contemporary culture.

Given this, we understand that the teacher in training (initial or continued) needs to have opportunities to experiment pedagogically and take digital technologies for themselves, incorporating them to their way of being and doing. Transformations of behavior and re-significations can occur, which involve the re-adaptation of customs, values, beliefs, attitudes and pedagogical practices (Lima, 2015). In this way, for changes to be viable, "even at subtle levels, it is imperative, on the part of teachers, to adapt to this new reality, which is quite different from what was experienced in the past and this, of course, it requires time, work and dedication" (Quintanilha, 2017, p. 251).

Considering these perspectives, the scientific research synthesized here aimed to promote continuing training for a teacher of basic education and enrich her pedagogical practices, bringing them closer to cyberculture. For this, we project the use of DICT/cyberspace by the teacher in her educational practice in a way that encourages participatory/collaborative strategies in her teaching process and encourages authorship, communication and student reflection. For this we project the use of digital technologies and their application to pedagogical practices, our main objective with this study was to identify the meanings given by teacher regarding that integration.

2. Methodology

To develop the research reported here, we started with a study about software resources and/or cyberspace environments, which could favor the design of interactive/collaborative strategies for DICT-mediated teaching. Subsequently, we project, implement and pedagogically accompany practices mediated by the DICT together with a teacher and her students. The actions of pedagogical intervention took place in a school in the interior of the state of Minas Gerais (Brazil) in two classrooms of the sixth year of basic education. The selection criteria of the school where we developed the research involved the structure of digital technologies available on the premises and the acceptance of a collaborating teacher[2] (hereinafter fictitiously treated as Professor X).

From the methodological point of view, we undertake an action-research (Thiollent, 1996). Our research actions aim to assess the perceptions and experiences of the collaborating teacher and, also, promote an intervention in the field of their actions. It was in that outline that we were present at the school and we accompanied Professor X and her students building and undertaking pedagogical strategies for the use of the DICT/cyberspace. In this sense, we proceed to the observations, accompany and interact with students of the Portuguese Language curricular unit in mediated pedagogical actions in cyberspace, in

the classroom, in the school's computer lab. Our observations and interventions occurred between 08/23/2016 and 10/04/2016.

During our school intervention we also sought to establish an opportunity for continuing education for Professor X, objectifying the overlap of her pedagogical work with cyberculture and the intentional use of the DICT/cyberspace. We assume the perspective in which continuing education during service (Almeida, 2004) could collaborate to broaden the field of work of the teacher, encouraging reflections and transformations in the teaching-learning process, as we believe that it is "the experience, [...] what gives meaning to education. We educate to transform what we know, not to transmit what we already know" (Rancière, 2002, p.11).

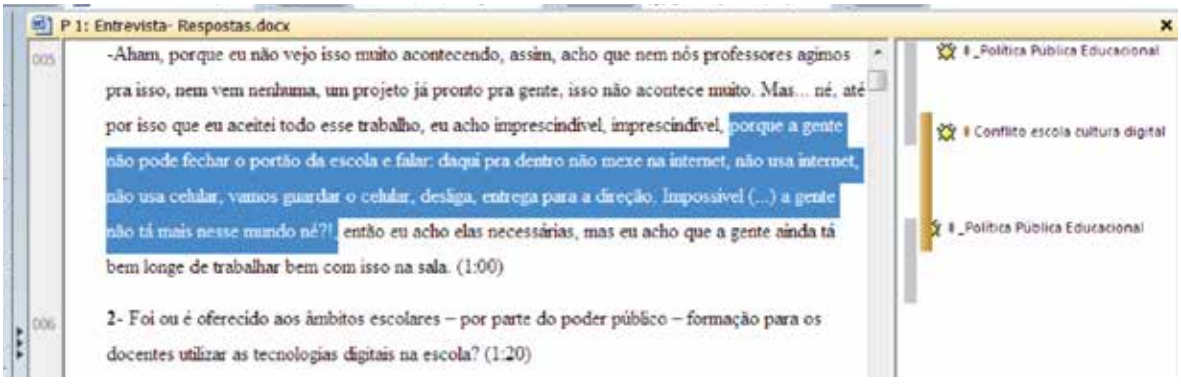
We reiterate that, in our action research - beyond the overlapping of the DICT in pedagogical practices -, we seek to identify the (re) signification of that experience for Professor X. In this way, we undertake a work of qualitative and exploratory nature, using a semi-structured interview as a data generating instrument. In a meeting outside the school environment, we took the testimony of our collaborator, which was transcribed and generated a corpus for our Content Analysis (Bardin, 1977). Beyond the interview, the data analysis was enriched with elements originating from our observations during the intervention actions within the school context.

Franco (2008) assumes as a starting point of Content Analysis the message, be it verbal (oral or written), gestural, silent, figurative, documentary or directly provoked. Thus, based on the transcription of Professor X's dialog, we used that corpus to proceed to the identification of fragments of interest, which were categorized in accordance with our research focus. Taking into account the conception of our analysis, we opted for its structuring in the Atlas.ti software, which aided in the process of treatment, relationship and inferences of the/with the data.

3. Analytical discussion and results

The construction of the Content Analysis (Bardin, 1977) of the empirical data in Atlas.ti was guided by our theoretical reference and research focus. Still, from the many re-readings made in the transcript, contributions that symbolized some reflections/impressions of Professor X. Those indicatives were not ignored. Structurally, we made 20 semantic codes/categories, which were associated to 76 discursive fragments of the transcript of the interview with Professor X (Figure 1). In the software used, it is the codes (or categories) that allow marking parts of the transcription, which semantically identify the units of meaning of the investigation. It is this process of association that structures the Content Analysis of the data in Atlas.ti.

Figure 1. Textual transcription and codes in the Atlas.ti software



Source: Screenshot in Atlas.ti software

The following subsections present excerpts from Professor X's discussions accompanied by an analytic discussion. In this exploratory study, we seek to systematize meanings given by the teacher to the experience of pedagogical work with the DICT. To this end, we organize our descriptors as follows: Public educational policies for digital technologies, cultural impact on teaching DICT, resources of cyberspace/DICT, reconfigurations of student action, empowerment of pedagogical practice with the DICT, evaluation of the Project and Perspective for new works with the DICT.

3.1 Public educational policies for digital technologies

With the code "Public Educational Policies", we seek to identify the impressions of the teacher regarding the public educational policies for the use of the DICT in the school under investigation. Directly linked to this focus of analysis, other categories will complement our understandings, namely: Technical support for DICT, DICT Infrastructure, Training for instrumental use of DICT and Pedagogical support for DICT. These last categories are directly related to the implementation of public policies in schools, bringing with it unfoldings that should not be analyzed in isolation. For that reason, we add our considerations in this analytical axis.

In her considerations, Professor X revealed that she did not identify actions of public educational policies aimed at digital inclusion in public schools and that, at times, teachers do not make demands on public authorities regarding that investment. Still, she warned us that even if that school had a well-structured computer lab, there were problems in its operation. During our stay in the school space for observations, we note - despite the infrequency of students in the computer room during the time of the teaching assignments of school teachers - the use of school computers in free courses taught for the community. Likewise, that school did not have continuous technical support for the maintenance of their equipment.

Specifically, about issues related to public policies on the expansion of access to the Internet in the school environment, we recorded that, from April 4, 2008, the Government of Brazil has launched the "Broadband in Schools Program". In its Decree 6.424, there is "the objective of connecting all urban public schools to the Internet, a global network of computers, through technologies that promote quality, speed and services to increase public education in the country" (Brazil, 2008). Even so, Professor X claimed the need for improvement of that resource, because, often, the internet did not work properly during the period of our interventions.

In our analysis - after the summary assessment of the context under discussion - we understand that Professor X considers that the material infrastructure conditions should not constitute obstacles for the development of pedagogical activities. In common agreement, we understand the material infrastructure as a fundamental condition to stimulate to change virtual experiences and encourage the construction of a collective intelligence (Lévy, 1999), which can favor the pedagogical use of the DICT/cyberspace.

It is also important to point out that, parallel to the infrastructure conditions, public policies of continuing teacher education are essential to create opportunities for contact and understanding of the pedagogical potential of digital technologies. In that aspect, Professor X highlighted:

> [07 ...] We had some years ago [...] courses that we had to review for the students, but they were courses, for example, [...] [...] Linux [...]It had nothing to do with the pedagogical, inside the classroom, and we made groups with the kids and reviewed what we learned, that was it. But there was no project directed for the classroom, for the Portuguese class, for the math class. [...] (Professor X).

In this discursive fragment, the teacher indicates the importance of a continuing edu-

cation contextualized in the cyberculture and adapted to the needs of the teachers. Such initiatives extrapolate technical and instrumental questions of the use of the DICT. With that, logically, the favored courses need to have a greater pedagogical focus. In other words, teachers need to "[...] be trained to know how to use microcomputers, develop a more student-centered education, be able to help them and create a learning environment favorable to the use of these new technologies" (Valente, 2011, p.28). And Professor X complemented:

> [034 ...] I think it's interesting, because we say a lot that students need that internet at school, that the student has to be included in that digital medium, but teachers are not included in it, so much so that the teachers do not go to the computer room. [...] (Professor X).

Notably, the speech of the teacher makes explicit the thought that only trying to include/approximate the student in the digital medium is insufficient. In that sense, Professor X indicates the need for effective digital inclusion of teachers. This is:

> More than equipping schools [with DICT], [the fundamental thing is] knowing what to do with the resources that are in the school. And that happens, necessarily, by the investment in the teacher's training and career and by the construction of a well-structured pedagogical project, which guarantees a truly transformative professional practice (Hanauer & Abegg, 2017, p. 14).

3.2. Teacher cultural impact in front of the DICT

The code "Cultural impact of teaching facing the DICT" was intended to record the unfolding of our action research in the pedagogical practice of Professor X. In this line, we identify a cultural impact caused by the work with the DICT. At first, the teacher revealed distrust in taking the students to the computer lab, as both she and the students were not used to working in that perspective. The teacher feared that the activity did not went well: "[048 ...] Oh, geez, go out with the children to the laboratory, they are not used to it, will it work? [...]" (Professor X). Regarding this, Teixeira (2016, p. 149) comments that:

> Despite the debates about the effective articulation of education with technology, they were already being carried out decades ago, the use of technological resources is still observed quite shyly in the contemporary educational setting.

Considering our field observations alongside what the teacher expressed, we noticed that the activities with the DICTs were unusual. That suggested to us that the proposal of a real work with digital technologies and the displacement for a space different from the habitually frequented one were causing an impact in their pedagogical beliefs. That is because, at different times in Professor X's dialog, we identified: uncertainties, fears, misgivings and a routine break, all constituting a context that, given the presence and intentional use of the DICT was challenging for her. In this way, we reiterate that:

> [...] the analysis of the issue of cultural impact experienced by the teacher in their pedagogical adaptation for the incorporation of technologies into their practices is linked to the school's organizational culture and, fundamentally, to the teacher's beliefs (Lima, 2015, p. 154).

Although they have constituted eventual impacts for Professor X, the misgivings and the break of pedagogical routine of the professor were not obstacles for the use of the DICT given their recognition of the challenges interposed by the cyberculture to the education. Undeniably, we experience a "transformation in the modes of parenting both ethically and aesthetically. The human creative act was, therefore, altered" (Coelho, Costa, & Mattar Neto, 2018, p.1079). By accepting our proposal to use the DICTs in her classes and collaborate with the activities, the

teacher had a notion of the need to accompany the sociocultural changes. Her attitude was preponderant for the success of our work and can be contextualized with the following statement:

> [054 ...] I already have ten years in the classroom, but it is not a profession that you say: I am ten years old, then, now I am ready, I already know how to teach! So, it is not that, it is that you are always evolving, if you do not evolve (...) it was already. You are going to stay with that speech that some teachers have: The children of the old days used to be good, they obeyed, they wanted to study, now look, they do not take a notebook, you see that they did not study for the test. (...) (Professor X)

The discursive fragment showed awareness of the teacher in relation to the constant transformations related to educational processes and, also, the indispensable need to accompany these changes by teachers and education systems. Thus, teachers are the main agents of change (Sandholtz, Ringstaff, & Dwyer, 1997) involved in the school-cyberculture approach, since they are the ones who define the ways in which technologies can significantly influence education.

3.3. Cyberspace/DICT resources

The code "Cyberspace resources/DICT" was destined to the identification of the DICT, which could be significant to the teaching practice in the cyberculture, making possible effective potentiation of participative/collaborative strategies in the teaching process. Our intention was to find resources that contribute to:

> The formation of critical students, with the ability to interpret and transform their context, recognizing that the computer and other technologies can be used for communication, obtaining information, expanding knowledge [...] (Maldonado, 2018, p. 41, free translation).

The planning of activities with the students of Professor X used - in addition to computers - two resources of cyberspace. The first was the Comic Creator - Boys' Life site, in which students will create virtualized cartoons. For the productions, the students dialogue among themselves, they changed experiences and they will question, exercising the authorship of their stories with autonomy of thought and interacting with their peers.

The second virtual resource was that of the Facebook group, for which the student authors' comics were published. We opted for this environment due to two reasons: its popularization among the students and the fact of allowing them to share their productions. Facebook is the most popular social network in the world, with more than 2.23 billion active users[3] (https://goo.gl/PT0dX2, accessed on October 24, 2018).

The posting of the activities in the cyberspace allowed the students to share, visualize, "like" and comment on the productions of their peers. We identify, together with Professor X, the recognition of that work and have enabled their students an opportunity to (re) construct knowledge through the change of experience (Panuci, Bianchini, Souza, Silva, & Munhoz, 2016). In practice, the work done ended up revealing productions - previously private and isolated - collective and accessible to other students. For the teacher, a reconfigured work emerged, more interactive and compatible with the budgets of cyberculture. In that respect, Professor X clarified:

> [042 ...] Well, I think the use of Facebook is very interesting, it's great [...] I think Facebook is good because of that, because it took a tool that they use a lot, that they like, It's fun, it's not boring, right, it's not tied to boring, heavy work, and it brought that to the classroom. That was the most interesting thing for me. (...) (Professor X)

Interestingly, the teacher reinforced the idea that in the use of that environment she respected and valued the individuality of each of the students, who created, published, commented on and described their feelings and thoughts without the

imposition of a linear and rigid structure. This story of the teacher reinforces that:

> (...) the insertion of technologies in the school environment, [may favor the reconfiguration of] teaching practices, no more just the structural and linear perspective of presentation and methodological development of the content to be taught [but following] another logic, based on the exploration of new types of rationales that are not exclusive, in which different possibilities of routing reflections are emphasized, in which the possibility of other relationships between apparently different areas of knowledge is stimulated (Kenski, 2006, p.38) .

These contributions suggested that the pedagogical practices with the DICTs allowed Professor X to understand that, when they are properly planned and executed, the actions with technologies end up favoring the reconfiguration of the student action, which is dealt with in the next subsection.

3.4. Reconfiguration of student action

The code "Reconfiguration of the student action" was destined to the identification of elements that suggested the recognition of Professor X regarding a process of reconfiguration of the student action (from the use of the DICT). We understand that the teacher should consider the use of the DICT in their pedagogical practice as one of the ways to try to expand the teaching-learning process.

Professor X told us her perceptions about the students' considerations with the activities carried out through the DICT:

> [036 ...] Yesterday, for example, (...) The student talked about some kind of work that we were going to do, that he said like that, we're going to do on the internet, we're going to put on the internet, we're going to do a group. So, I thought, look at the little seed, because they did not talk about that before, then they liked that idea that everybody is there, then that's already the case, their will to continue doing it. (...) (Professor X)

This discursive fragment suggested to us that the activity carried out was significant for the students and made possible a rethinking of the field of student action (Papert, 1985). After the execution of the project, the students will go on to claim new forms of work using the DICT through which they could create, interact and share, as it happened in the creation of comic strips and publication on Facebook: "[099...] They highlighted that in their comments, 'the class was very good', 'I want to go more times' [...]" (Professor X).

And, in another moment of her interview, the teacher reinforced the success of the proposal for the resignification of student actions:

> [046 ...] so, I think the interesting thing was that, that he created, he was the protagonist. He created, he analyzed himself, he corrected himself, truth, he analyzed the other, then, I think, in that sense of the protagonism itself, of the student, there in the work that was done. (...) (Professor X)

The use of DICT in education needs to aim to overcome the barriers of a traditional class, in which the teacher is seen as a loaner of knowledge and the student as a white sheet on which knowledge will be printed. Professor X would therefore be faced with an opportunity to break with the exclusivity of knowledge stored in the p.s of books (Serres, 2013) and the traditional practices of recitation, silent reading and timely repetition. However, with the DICT and its pedagogical appropriation, "Knowledge propagates in a homogeneous decentralized space, free movement. The classroom of the past died, although we still see it so much, even if we only know how to build other equals [...]" (Serres, 2013, p. 49).

Despite recognizing the value of instruction in a teaching process, we fight against its exclusivity as a didactic resource. Thus, we consider that the reconfiguration of student action is based on transforming the learner into an (inter)

active subject in the teaching-learning process and the teacher into a mediator of student learning with the DICT. That is:

> The teacher becomes an animator of the collective intelligence of the groups that are at his charge. Its activity will be centered on the accompaniment and the management of learning: the incitement of the change of knowledge, relational and symbolic mediation, the personalized piloting of learning routes, etc. (Lévy, 1999, p. 171).

In this way, the student is configured as an author in the teaching-learning process and their individuality, culture and reality are respected. In front of the practices carried out with digital technologies, Professor X told us her perception about the beginning of a reconfiguration of the student action, since the activities will modify the position of the students, emerging the authorship in the cyberspace. In this way, the use of the DICT in the classrooms fostered the overcoming of instruction based on the transmission of information, making it possible for the subjects involved to mobilize, move, dialogue and exchange information (Serres, 2013) aiming at the construction of their learnings. That is the reconfiguration of the student's job, before said receiver of contents and executor of instructions, for a more participative student and notion of their place in the learning process. Consecutively, these referrals will eventually germinate a process of pedagogical (re) empowerment in Professor X, which we synthesize in the next subsection.

3.5. Enhancement of pedagogical practice with the DICT

The code "Potentiation of the pedagogical practice with the DICT" was destined for the record of the unfolding of our investigation-action in the pedagogical daily of Professor X, indicating modifications. It is important to highlight that the context of this code was related to the two codes already presented: "Reconfiguration of student action" and "Resources of cyberspace/ DICT". We sought to provide Professor X with ongoing training with the purpose of enhancing her practice, because "you can not demand change in the profile of education professionals" (Souza & Schneider, 2016, p.420) without considering the fact that their initial formations still occur under traditional molds.

As it was previously seen, we identified in the contributions of Professor X or story that the virtual activities undertaken with the students were profitable. The teacher emphasized her awareness that the execution of the project with the DICTs did not change the whole school reality, but contributed to the expansion of her pedagogical actions. She also highlighted the student's interest and willingness to participate in the activities, once that practice was not evaluated (in the sense of being awarded a score): "[054 ...] it was not an evaluated activity, it was not that thing , good point, is to deliver at a set date, then, well, they did, because they wanted. [...]" (Professor X).

Combined, those aspects will collaborate for a beginning of reconfiguration of the field of student action and for the enhancement of the pedagogical practice with the DICT. In the end, the planning of our interventions together with the teacher was conceived in the "direction [of] an instruction centered on the student, and not on the curriculum, in the direction of collaborative tasks, and not individual tasks, in the direction of learning active, not passive" (Sandholtz *et al.*, 1997, p.33). In other words, Professor X allowed herself to work with the DICT in order to "think, instead of imitate" (Kohan, 2013, p.71) the methods used in the teaching practice, resignifying her teaching and the means for the promotion of learning:

> [091 ...] we give many classes, you do not spend much time talking 'No, that week, I'm going to do that way, that way, with that turma'. No, you're taking, the classes all the same and that's getting tedious, but it's comfortable for me as a teacher. Only that there comes a project of

> that is says: 'Let's go to the laboratory' (...). So, that already gives me a jolt, it has no shape, I had to move a little and that was very good in that sense, you discover that you can do little different from your routine (...) (Professor X).

By favoring creative expression, dialogue and interaction in cyberspace, the activities carried out allow students to assume a more active position in the construction of their knowledge (Papert, 1985), breaking with the tradition that "rarely opens gaps for place ourselves as subjects of our learning" (Kenski, 2006, p.123). Obviously, this dynamic of renewal of the field of student action was not unnoticed by Professor X, who happened to occupy the position of mediator of learning routes, minimizing the dichotomy between educator and educated. In this perspective of active and collaborative teaching, the teacher also learns while teaching, emerging collective intelligence (Lévy, 1999) based on communication - inside and outside cyberspace - among all the members of the process.

The teaching approach to DICT and the pedagogically planned incorporation of these technologies into the teaching practices will provide Professor X with a reflexive process, which contributed to the beginning of (re) significance of her actions. Therefore, it is worth noting that those changes in the pedagogical routine did not happen in a linear manner and without tensions. Conversely, the displacement of the pedagogical tradition implies challenges that decentralize the management of knowledge construction and make time (s) and operations space (s) more flexible (Panuci *et al.*, 2016). It was in this perspective that Professor X, during the project, hardly transmitted information, but accompanied and encouraged the production of students in cyberspace, planning more interactive and collaborative learning routes.

3.6 Project evaluation and perspectives for new work with the DICT

The code "Project Evaluation and perspectives for new work with the DICT" was intended to record the considerations of Professor X about our action research with her students, pointing to its validation. In the beginning, we sought to understand how the teacher evaluated the activities undertaken with the students. The code "Perspectives for new work with the DICT" was already destined for the registration of the manifestations of the teacher with respect to possible future work with the DICT in their practices.

In the analysis of the discursive fragments of Professor X concerning the evaluation of our intervention, the teacher evidenced modifications in her teaching practices. The teacher reported that the work carried out motivated her to plan didactically differentiated activities with the students using the DICT. We seek to enable the teacher to perceive the interactive potential of cyberspace, which could conceive, in her teaching process, the possibility of adding something new to her everyday life (Rancière, 2002). In this aspect, Professor X reinforced that the action search collaborated to review her practice in the sense of opening new perspectives to make her classes more dynamic, situated and meaningful:

> [054 ...] Another advantage of that project was that, that broke that, those misgivings to leave with them from the classroom. I left, everything happened well and, that's it, I think that (...) enriched.

> [065 ...] those small things bring difference, yes, for the classroom, (...) because the environment, the day to day at school is very arid, very painful, so, because it is tired, true? (...) these things give the same air (...) (Professor X).

Through the final positive evaluation of our project, we understand that collaborative planning and its gradual and clarified implementation, together with pedagogical support,

can favor the adoption of new perspectives for educational processes mediated with DICT. In the meantime, it can not be ignored that the education reform depends on the teachers, on what they think and do in their pedagogical daily life, "in the end, it is the teachers who determine what happens in the classroom and in what ways Innovations are, or are not, implemented" (Sandholtz *et al.*, 1997, p.20).

Our action research did not aim to use the DICT to replicate the ordered teaching during the instruction. The choice of this methodology was intended to approximate the teaching practices of the DICT in order to instigate the student's potential and encourage authorship and knowledge exchanges. Our intention is to explore the functionalities of the technologies to instigate the cognitive/creative potential of the students and to potentiate the pedagogical actions of the teacher.

Professor X told us that, although after conducting the action research, students will request new work using the DICT, suggesting a perspective for future work: "[036 ...] probably, that will happen, we will do other things. (...)" [099 ...] "We go more times, right? (...)" (Professor X).

Finally, we believe that the work undertaken with Professor X, provided an opportunity for review and/or re-signify its field of action and the beginning of a process of pedagogical appropriation of the DICT. The interventions made opened perspectives for new works using cyberspace and potentiating authorship, interaction, creation and dialogicity (Freire, 2005).

4. Final considerations

The present work aimed to contribute and enrich the pedagogical practices of a teacher of basic education, approaching it to the cyberculture. Making the approach between teacher-DICT/cyberspace, we seek to identify the meanings given by the collaborating professor of the study regarding the process of integration of those technologies to their teaching practices.

From the contributions of the teacher, we identify - in her vision - the existence of few Public Educational Policies oriented to the inclusion of digital technologies in schools. In this sense, we find in the researched school the precarious support of infrastructure and the lack of pedagogical support directed to the orientation of teachers in activities with the DICT. We noticed that, when proposing activities with digital technologies, Professor X was leery of taking the students to the computer lab: both the teacher and the students were not used to working in that way. That suggested to us that the proposal of an effective work with digital technologies and the displacement for a space different from the habitually frequented could be causing a cultural impact on the teacher. Moreover, Professor X understood the proposal and assumed it as an opportunity to review actions and personal training, remaining open to planning and committed to its effectiveness.

With experiencing the practice with DICT, Professor X positively evaluated the intervention, considering the activities as significant for her students. The teacher took as a basis for her evaluation the fact that, even after the execution of the project, the students will continue to claim new forms of work using the DICT/cyberspace. What happened to be at stake in the pedagogical routine were the possibilities of creation, interaction, publication and communication in networks. In her final assessment, the teacher let us know that our action research and activities with digital technologies contribute to the enhancement of their pedagogical actions.

Aware that the actions planned and undertaken in this scientific research constituted only one (micro) possibility of reflection for the change in the pedagogical daily life of Professor X and her students, we reiterate the importance of the production and socialization environments of cyberspace to the process teaching-learning. However, we reject the deterministic view that the DICT/cyberspace, by itself, will bring changes in the school culture. The decisive factor in

this approach to the school and its practices of cyberculture lies in the perceptions of pedagogical effects and gains by teachers. Therefore, it is necessary that the teacher - through initial and ongoing training - be able to appropriate the DICTs in order to reconfigure their practice in the cybercultural context. There is evidence of possible transformations of behavior and resignifications, revealing a continuous dynamic that involves the readaptation of customs, values, beliefs, attitudes and pedagogical practices.

Finally, our incursion in the field and the analytical systematizations suggest that the revision of teaching beliefs - through the presence and pedagogically clarified use of the DICT/ cyberspace - consolidates a possibility of overcoming the pedagogical culture of transmission, based on recitals, copying, memorization and reproduction of information.

5. Support and Acknowledgments

To the Amparo à Pesquisa de Minas Gerais (FAPEMIG) Foundation, for the granting of a Scientific Initiation grant for the execution of scientific research.

To the Pro-Rectory of Pesquisa e Pós-graduación from the Federal University of São João del-Rei (PROPE/UFSJ), which has always been solicitous of our demands, attending us promptly and punctually.

Notes

1. According to Internet World Stats (2018), Latin America has an estimated population of 647 604 645 inhabitants, of which 404 269 163 are Internet users (62.42%).
2. Register that the collaborating professor of this study signed a free and informed consent term, by which she voluntarily and consciously participated. The teacher had her name replaced throughout the text in compliance with the anonymity provided in the document.
3. Active users are those who will log in to Facebook during the last 30 days.

Bibliographic references

Ally, M., & Prieto-Blázquez, J. (2014). What is the future of mobile learning in education? Mobile Learning Applications in Higher Education. *Revista de Universidad y Sociedad del Conocimiento (RUSC), 11*(1), 142-151. http://dx.doi.org/10.7238/rusc.v11i1.2033

Almeida, M. E. B. (2004). *Inclusão Digital do Professor: formação e prática pedagógica.* São Paulo: Articulação.

Bonilla, M. H. S. (2009). Inclusão digital nas escolas. In A. C. F. Pinheiro, & M. Ananias (Orgs.), *Educação, direitos humanos e inclusão social: histórias, memórias e políticas educacionais* (183-200). João Pessoa, Brasil: Editora da UFPB.

Coelho, P. M. F., Costa, M. R. M., & Mattar Neto, J. A. (2018). Saber Digital e suas Urgências: reflexões sobre imigrantes e nativos digitais. *Educação & Realidade, 43*(3), 1077-1094. https://dx.doi.org/10.1590/2175-623674528

Bardin, L. (1977). *Análise de conteúdo*. Lisboa: Edições 70.

Brasil. (2008). *Decreto* nº 6.424. Brasília, Brasil. Recuperado de https://goo.gl/vNdMk7.

Franco, M. L. P. B. (2008). *Análise de Conteúdo*. Brasília: Liber Livro Editora.

Freire, P. (2005). *Pedagogia do oprimido.* Rio de Janeiro: Editora Paz e Terra.

Hanauer, M., & Abegg, I. (2017). Políticas públicas e programas de incentivo à integração de tecnologias no ensino. *Jornal de Políticas Educacionais, 11*(16), 1-18. http://dx.doi.org/10.5380/jpe.v11i0.53196

Kenski, V. M. (2006). *Tecnologias e ensino presencial e a distância*. Campinas, Brasil: Papirus.

Kohan, W. O. (2013). *O mestre Inventor. Relatos de um viajante educador.* Belo Horizonte: Editora Autêntica.

Lévy, P. (1999). *Cibercultura*. São Paulo: Editora 34.

Lima, M. R. (2015). *Projeto UCA e Plano CEIBAL como possibilidades de reconfiguração da prática pedagógica com as Tecnologias Digitais de Informação e Comunicação*. Tese de doutorado em Educação. Universidade Federal de Minas Gerais, Belo Horizonte, MG, Brasil. Recuperado de https://goo.gl/VA8PzV

Maldonado, M. E. (2018). El aula, espacio propicio para el fortalecimiento de competencias ciu-

dadanas y tecnológicas. *Sophia, 14*(1), 39-50. https://dx.doi.org/10.18634/sophiaj.14v.1i.822

Medeiros, Z. A. (2011). *Letramento digital em contextos de autoria na internet*. Tese de doutorado em Educação, Universidade Federal de Minas Gerais, Belo Horizonte, MG, Brasil.

Moraes, D., & Lima, C. (2018). O estudante e sua relação com as tecnologias digitais: Representações em sua aprendizagem. *Revista Teias, 19*(53), 299-313. https://doi.org/10.12957/teias.2018.33212

Papert, S. (1985). *Logo: Computadores e Educação.* São Paulo: Brasiliense.

Panuci, L. R., Bianchini, L. G. B., Souza, C. J, Silva, J. B., & Munhoz, C. M. E. (2016). Interações, Celulares Smartphones e Processos de Ensino e Aprendizagem. *Revista de Ensino, Educação e Ciências Humanas*, *17*(2), 105-111. http://dx.doi.org/10.17921/2447-8733.2016v17n2p105-111

Passarelli, B. (2017). Os desafios do contemporâneo hiperconectado. In B. Medeiros. Neto (org.), *O cidadão contemporâneo frente às tecnologias da informação e comunicação* (17-22). São Paulo: FAC Livros.

Pinto, Á. V. (2005). *O conceito de Tecnologia*. Rio de Janeiro: Contraponto.

Quintanilha, L. F. (2017). Inovação pedagógica universitária mediada pelo Facebook e YouTube: Uma experiência de ensino-aprendizagem direcionado à geração-Z. *Educar em Revista,* (65), 249-263. https://dx.doi.org/10.1590/0104-4060.50027

Rancière, J. (2002). *O mestre ignorante: Cinco lições sobre a emancipação intelectual.* Belo Horizonte: Editora Autêntica.

Sandholtz, J. H., Ringstaff, C., & Dwyer, D. C. (1997). *Ensinando com tecnologia: Criando salas de aula centradas nos alunos.* Porto Alegre: Artes Médicas.

Santaella, L. (2013) *Comunicação ubíqua: Repercussões na cultura e na educação.* São Paulo: Editora Paulus.

Serres, M. (2013). *Polegarzinha*. Rio de Janeiro: Editora Bertrand do Brasil.

Silva, M. (2010). Formação de professores para docência *online*: Uma pesquisa interinstitucional. *Anais do Encontro Nacional de Didática e Prática de Ensino*, Belo Horizonte, Brasil, 15.

Souza, A. A. N., & Schneider, H. N. (2016). Tecnologias digitais na formação inicial docente: Articulações e reflexões com uso de redes sociais. *ETD – Educação Temática Digita, 18*(2), 418-436. https://doi.org/10.20396/etd.v18i2.8640946

Teixeira, V. (2016). Tecnologia e políticas educacionais: Desafios e contribuições das tecnologias da informação e comunicação em escolas estaduais da cidade de Itaperuna. *Texto Livre: Linguagem e Tecnologia, 9*(1), 140-159. http://dx.doi.org/10.17851/1983-3652.9.1.140-159

Thiollent, M. (1996). *Metodologia da Pesquisa-ação*. São Paulo: Cortez Editora.

Valente, J. A. (2011). Um *laptop* para cada aluno: Promessas e resultados educacionais efetivos. In M. E. B. Almeida, & M. E. B. B. Prado (Orgs.), *O Computador Portátil na Escola* (20-33). São Paulo: Avercamp.

