

Developmental pathways of appropriation and educational use of digital network technologies enhanced in pedagogical architectures

Percursos formativos de apropriação e uso pedagógico das tecnologias digitais de rede potencializados em arquiteturas pedagógicas

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Abstract

This paper consists of analysing the Developmental pathways of educational appropriation and use of digital network technologies by professionals of Basic Education via Pedagogical Architectures. In order to do so, every fortnight a face-to-face teacher training programme at a public school in the city of Juara-MT, Brazil was conducted. The theoretical, conceptual and methodological background that supported the developmental endeavours and processes were action research in tandem with the research-training postulations. For the composition of the *corpus* to be analysed, data collected through questionnaires and excerpts from narratives written in reflexive memorials were used. The information produced by the research indicates that the learning of the apprentice is motivated by the need that s/he feels with reference to his/her professional development and performance. It was demonstrated that participants had little acquaintance with digital network technologies at the initial phase of the project. However, they managed to grasp the need to include their students in the digital culture aiming at enhancing their communication, argumentation and knowledge reorientation. The challenges faced point out to the importance of conceiving collaborative research actions aimed at establishing interactive practices and processes of creation and authorship in hybrid training environments supported by digital network technologies.

Keywords: Teacher training. Pedagogical architectures. Cyberculture. Facebook.

Resumo

Este texto consiste em analisar os percursos formativos de apropriação e uso pedagógico das tecnologias digitais de rede pelos profissionais da Educação Básica via Arquiteturas Pedagógicas. Para tanto, realizou-se, quinzenalmente, ações de formação presencial e à

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distância em uma escola da rede pública de ensino situada na cidade de Juara-MT, Brasil. Os fundamentos teóricos, conceituais e metodológicos que sustentam as ações e processos formativos são a pesquisa-ação ao lado dos pressupostos da pesquisa-formação. Para a composição do *corpus* de análise, utilizaram-se dados coletados por meio de questionários e excertos de narrativas escritas em memoriais reflexivos. As informações produzidas pela pesquisa apontam que a aprendizagem do profissional da educação é motivada pela necessidade que sente com referência a atuação e desenvolvimento profissional. A pesquisa demonstra que os participantes, no início do projeto, apresentavam pouca familiaridade com as tecnologias digitais de rede, mas compreenderam a necessidade de incluir seus estudantes na cultura digital, com a prerrogativa de potencializar suas capacidades de comunicação, argumentação e (re) construção de conhecimentos. Os desafios vivenciados no âmbito da pesquisa sinalizam para a importância de se pensar ações de pesquisas colaborativas voltadas para instituir práticas e processos interativos de criação e autoria em ambientes formativos híbridos com suporte das tecnologias digitais de rede.

Palavras-chave: Formação continuada. Arquiteturas pedagógicas. Cibercultura. Facebook.

Introduction

The developmental potential made possible by the connectivity and pedagogical use of digital network technologies is based upon the need to create research projects that facilitate and concurrently enable conditions for participation and immersion of education professionals and students in the dynamics of digital culture.

Consequently, continuing teacher training for the appropriation and pedagogical use of digital network technologies raises a new developmental dimension once the aim is to foster a dialogue amongst the Pedagogical Architectures and the explicit theory, the systematisation of innovative methodologies and the creative practices, according to Carvalho, Nevado and Menezes (2007). It's therefore assumed the need for teacher training curricula to have their purposes linked to the interactive potential of digital network technologies for the creation of new scenarios and pedagogical practices, so as to support the Pedagogy of the Uncertain, which is based on five principles according to Carvalho, Nevado and Menezes (2007). These are: (1) educate in the search for the solutions of real problems; (2) educate to transform information into knowledge; (3) educate for authorship, expression and turn-taking; (4) educate for research; (5) educate for autonomy and cooperation.

In this paper, an analysis of the developmental pathways of appropriation and pedagogical use of digital network technologies by the teacher trainees of a school in the state education network is presented. This is the result of participation and studies promoted through the activities of an inter-institutional⁵ research project as part of a partnership between the State University of Mato Grosso (UNEMAT), Campus Juara-MT, and the Training and Updating Centre for Primary Education Professionals (CEFAPRO)⁶.

⁵ This research project was approved by the Edital No. 003/2014 of the Foundation for Research Support of the State of Mato Grosso (FAPEMAT), whose period of validity comprises the month of September 2014 to July 2017.

⁶ The teacher training programmes are seen as a set of public educational policies of the State Secretariat of Education (SEDUC) / MT - Brazil. These are implemented by CEFAPROs, distributed throughout the territory of Mato Grosso via the Educator Room Project (PSE) in different school units which are, in turn, located at the sites attended by the teachers who make up several areas of knowledge as part of CEFAPROs (MATO GROSSO, 2010).

In the teacher training processes, trainees were rallied to experiment and undergo the learning of the conceptual, technical and pedagogical dimension of the use of digital network technologies. The developmental actions for the appropriation and immersion into the digital culture were planned focusing on the combination of theory and practice.

The major challenge of training actions was to gather the trainees to seize digital network technologies with the critical spirit of designing them according to the contemporary culture, so that they could enhance the reinvention of pedagogical and curricular practices, since students want to take the lead of their own learning processes, authorship and knowledge in school.

To that end, this paper is organised in five parts. First, we present a snippet of the concept of Pedagogical Architectures, a pedagogical model organised with the support of the digital network technologies that, according to Marcon, Machado and Carvalho (2012, p.4), “enhance educational dynamics that take into account the needs of society by integrating education and technology”.

In the second part, we briefly discuss digital network technologies in contexts of training, highlighting that in these rapid social transformations, culture is understood as a dynamic and mutant movement. That is why school and trainees face a challenge to understand digital culture as an inherent movement of cyberculture (LEMOS, 2010).

The methodological path, the protagonists and the instruments of data collection are in the third part of the paper as the evolution of the developmental route in the research realm is outlined.

In the fourth part, we give out the results and analysis of the data. Eventually, in the final section we set the limits as well as new studies perspectives.

Pedagogical Architectures: an epistemological and pedagogical postulation

Studies inherent to the Pedagogical Architectures indicate that this open possibility of learning presents itself as a pedagogical proposal that has gained remarkable prominence in the contemporary educational context. The Pedagogical Architectures play an important alternative in the educational processes that sustain pedagogical actions of innovation. Therefore, they are invaluable when it comes to promoting challenging learning situations with the support of digital technologies and telematics resources within the framework of training practices.

The concept of Pedagogical Architectures is new in Brazilian education, where studies and research were carried out in the 21st century. The productions accessed show that this learning architecture still presents itself as a concept under construction, which highlights the utmost need for studies within its bounds.

It was proposed by Carvalho, Nevado and Menezes (2007) whose concerns laid in establishing new possibilities and innovations in educational practices supported by the use of digital network technologies in the pedagogical context. Due to the nature of coupling different learning objects to support the learning process, the Pedagogical Architectures privilege learning situations that foresee the integration of pedagogical theory and telematic support.

Carvalho, Nevado and Menezes (2007, p. 39) state:

Pedagogical architectures are, above all, learning structures made from the confluence of different components: pedagogical approach, educational software, internet, artificial intelligence, distance education, time and space design.

The authors' outlook is that the Pedagogical Architectures are characterised by the integration of multiple theoretical, methodological and technological devices design which are planned and articulated for the accomplishment of learning situations. Therein the learners are exposed to experiences that demand intense interactions and, particularly, problematising experiences that converge into cooperative work, where there is "the enlargement of individual and group capacities [...]" (CARVALHO; NEVADO; MENEZES, 2007, p.40).

In other words, Pedagogical Architectures-based learning situations go far beyond the combination of technological tools. They increase the power of curricular proposals that transcend the linear dimension and the compartmentalisation of school subjects. In this regard, Carvalho, Nevado and Menezes (2007) state that in practices based on Pedagogical Architectures, the curricular proposal transcends the aforementioned dimension. The disciplinary character is expanded by the need of a dialogue with other areas of knowledge, since the learner is challenged to interact with different learning situations in which s/he has the freedom and autonomy to choose, either individually or collectively, the path to follow and the place to be settled.

The Pedagogical Architectures, in Silva's (2014) understanding, presuppose the protagonist learners, since they are urged to participate actively in decision-making processes, to become authors, to build responses to problematic situations presented to them, to seek and to work with information, to operate with temporary certainties and doubts, to interact and to work in cooperation with their peers.

In the Pedagogical Architectures proclaimed by Carvalho, Nevado and Menezes (2007), the paths are either wider or closer. Nonetheless, these are made up by informative and very triggering activities. This perspective points out that the Pedagogical Architectures present themselves as a possibility to think about learning, with a view to (re)invent educational and developmental processes which are essential for training proposals.

Carvalho, Nevado and Menezes (2007) argue that the aim of the Pedagogical Architectures is fostering its dialogue with the explicit theory, the systematisation of innovative methodologies and the creative practices.

Lindner (2009, p.39) defines "Pedagogical Architecture as a set of strategies, group dynamics, educational software and tools to support cooperation that may favour learning". The Pedagogical Architecture created by the researcher was framed as "experimental activities, video productions and modelling in digital environment so that students can represent the concepts of chemistry constructed throughout the process" (LINDNER, 2009, p.38).

Silva (2014) corroborates these ideas by asserting that the Pedagogical Architectures themselves should be thought of as an interface that adds a pedagogical proposal allied to problematising theoretical-methodological approaches, with a view to eliciting different learning dynamics and, synchronously, integrating diverse digital technologies and telematics resources in the processes so as to reach the previous purposes outlined in the educational forethought.

The possibilities of use of the digital network technologies suggest that the more enriched and challenging the didactic situation to be experienced by the apprentice is in the proposals of the pedagogic architecture, the better learning conditions the subject has when interacting and using handling digital objects in their developmental processes.

According to Almeida's (2006, p.205) judgement, such interactive dimension for the use of digital network technologies in pedagogical practices "make a dialogical and intersubjective creation possible by the interactions between thoughts, concepts, images, media and ideas in which the subject acts consciously with the objects of knowledge".

Almeida's point of view (2006) highlights that the interactive potential of technologies allows the creation of new scenarios and practices in the educational field. This leads us to think that it is imperative to exploit such potential in order to create Pedagogical Architectures that support triggering and rallying approaches. Such entitle to dialogical actions, subjective and intersubjective exchanges, and cooperative work that are, in turn, integrated with digital and/or printed technologies available in educational contexts.

Digital network technologies in the context of ongoing teacher training

The presence of digital network technologies in different contexts of society has led to changes in the daily lives of people by triggering, mainly, the feeling that we are always behind when it comes to the scientific-technological revolution that moves society, economy, culture and education. Silva (2014) thinks that digital network technologies (DNT) are expressions of the transformations from the presence of computing and telematics resources in contemporary society. The same author also asserts that

[...] it was these rapid evolutions that enabled the different forms of communication and interaction in digital spaces via computerised resources. It is this convergence of information and communication technologies (ICTs) present in the sociocultural context that is responsible for the profound changes in people's actions, mainly in the way of communicating, working, interacting, learning, cooperating, shopping, entertaining. In addition, these technological devices enable people to build new dynamics of interaction and communication with social and cultural reality. The origin of contemporary society is based upon the relational triad between culture, technologies and society. [...] (SILVA, 2014, p. 29).

Digital network technologies are those of the networked society (CASTELLS, 1999), so they enhance connectivity in the network, intensify communicative practices, favour information exchange, the sharing and collaborative network production. These can be considered digital network technologies: laptop, netbook, notebook, mobile devices such as mobile phones, amongst others.

In addition, as citizens/educators, we are mobilised to conceive digital network technologies in a critical perspective not only in order to understand their relationship with the productive economy, but also as opportunities to foster new practices of communication and dialogue, knowledge production and experiences, coexistence

and creation, where education is the space where emancipatory and transformation actions take place, once

The world as a horizon of activities is also organised in a human and social form. It takes the form of tools and machines, devices, structures, institutions, organisations, divisions of labour, etc. Man finds them already there, when he is born and, in the same way, finds symbolic forms; it is the appropriation of this socially related structured world that he undertakes (CHARLOT, 2000, p. 84).

Within such social rapports in the last decades, human beings have constantly been challenged to coexist and intervene in their different actions with the vertiginous transformations that spread out from the emergence of the networked society (CASTELLS, 1999). This emergence has triggered profound changes in social dynamics, affecting mainly the cultures and lives of people in their processes of communication, interaction and acting, whether in the work or outside. “Information and communication technologies have had a strong effect on the transformation of markets and work processes” (CASTELLS, 1999, p.8).

This new era characterises what Lemos (2010) calls the digital paradigm. We live a new civilisation in which information is spread around by means of the virtualisation of the world, which ends up affecting culture, art, education and social life.

The digital paradigm and the circulation of information in network seem to be the backbone of contemporaneity. It is in this context that we must think of the electronic or digital art matter, because it will both accept and explore the dematerialisation through which the civilisation of the virtual is based upon. Contemporary electronic art touches the core of this civilisation: the dematerialisation of the world by virtual technologies, interactivity and hyper-textual possibilities, the (virtual) circulation of information through planetary networks. Art enters into the global virtualisation process of the world. (LEMOS, 2010, p. 178).

The networked society as Castells (1999) argues is based on the strong presence of digital technologies and virtual interaction networks. This digital paradigm, in the assertion of Lemos (2010), shows other possibilities of immersion of teachers and students in cyberculture, which is conceived as a new manifestation of the social vitality of contemporary culture. For Lemos (2010, p.87):

Cyberculture will be characterised by the formation of a society structured through a generalised telematic connectivity, broadening the communicative potential, providing the exchange of information in the most diverse forms, fomenting social aggregations. Cyberspace creates an operative world, interconnected by icons, portals, sites and homepages, grating a young, tribal and gregarious culture the power of production of information, of adding noise and collage, of throwing excess to the system.

Social interaction or sociability are markedly the characteristics of digital culture or cyberculture. Lévy (2000, p. 17) sees cyberculture as “a set of (material and intellectual) techniques, practices, attitudes, ways of thinking and values that are developed along

with the growth of cyberspace.” In digital culture, the social interaction between the subjects is enhanced by the mediation of different digital resources⁷.

The potential of cyberculture extends the range of how human beings can invent and interact with diverse contemporary cultures, as well as produce new ways of subjectivities, authorship processes, writings, and collective readings. As the considerations of Nevado, Carvalho and Menezes (2007, p. 30) make clear:

The availability of a diversity of information that will be reinterpreted and reworked, contributing to the development of a collective dimension of intelligence, through processes of authorship, new ways of writing and collective readings, in which texts are reconfigured, augmented and interconnected to others through hyper-textual links.

Thanks to the countless resources available in the Web 2.0, new possibilities of interaction, communication and interactivity⁸ in the network are strengthened when it mainly comes to the training of educational professionals in the distance or semi-private mode.

[...] in the Web 2.0, collaborative processes and participatory production architectures started to take over communication, such as wikipedia, blogs, podcasts, social networks like Second Life, Twitter, Facebook, Flickr, MySpace, Instagram, YouTube. These have invited its users to authorship and participation (SANTOS, CARVALHO; SANTOS, 2014, p. 55).

The Pedagogical Architectures constitute digital interfaces that favour and flexibilise the educational and curricular proposals in the ongoing training, given the possibilities of interaction and interactivity made possible in the developmental actions in the distance mode. In this process, digital interfaces of social networks on the Internet, especially Facebook, were justified for two reasons: first because it enhanced communication, interaction, interactivity and the sharing of ideas and pedagogical experiences between peers and teacher trainers, since the face-to-face meetings at the school took place fortnightly; and the second reason was because it is a digital network of everyday use for educational professionals, from the partner school.

Research method and its contextualisation

The challenge presented to trainees has to do with working together in the process of searching and constructing a theoretical-methodological framework that points out feasible integrative alternatives actions of theory and practice as fundamental principles in the trajectory of studies and research.

In this regard, ongoing education is conceived as an event that enables action-research participants to construct new ideas conducive to free thinking, reflection, questioning, problematising and, above all, constructing knowledge for the purpose of engendering

⁷ “Digital resources are computerised elements, such as digital images, videos, animations, hypertexts, among others, that enable interactivity between the user and the performance of a given activity or action” (TORREZZAN; BEHAR, 2009).

⁸ Silva (2010, pp. 83-84) says that interactivity implies that “learning from the movement of new techniques is first of all to learn from the new communication modality. That is: to learn that to communicate is not simply to transmit multiple dispositions to the intervention of the interlocutor “

differentiated pedagogical practices and, at the same time, having the possibility of thinking about possible innovations in the pedagogical actions of the classroom, as well as of the very institution to which they belong.

Continuous training practices supported by the interaction and cooperation paradigm presuppose methodological procedures that favour action-reflection-action (SCHÖN, 2000), as core principles of the process of learning and professional development. Thus, further study, research and training proposals are anchored in the foundations of the action-research method, recognising its dimension of movement, flexibility and, above all, its recursive effect as a permanent reflection on action (BARBIER, 2007). This allows teacher-trainers/researchers and research interlocutors to reflect on the change in attitudes that are essential to achieving the objectives of the project along with its processes and practices, as Barbier (2007, P 106) declares:

Action research aims at changing attitudes, practices, situations, conditions, products, discourses [...] due to a target project that always expresses a system of values, both and individual and collective philosophy of life, supposedly better than the one which presides over the established order.

The researchers' ongoing training route takes over the character of a process, of continuity, in this perspective due to its permanent action rebuilding. This is the pillar of the act of reflecting since it is the driver of new actions in a dialectical movement. This peculiar characteristic of the continuous development is presented as one of the potential possibilities of the construction of scientific knowledge responsible for rallying trainees to question even their jobs in the institution as well as simultaneously in the scope of the classroom.

Due to the collaborative dimension of the study, the diagnostic mapping of the school reality, research, analysis, experiments and the production of teaching materials were shared and discussed in group meetings. With this very same collaborative conception, research procedures took place in the context of the school, the training *locus* where discoveries, concerns, new ideas and initiatives, advances and setbacks were shared with the community involved.

Therefore, action research is an alternative that significantly collaborates with the mobilisation of this dialogue, since it is a method that always presents itself not only as a political questioner but also as a changer that affects the social "mud" by its actions (BARBIER, 2007).

Alongside the action-research method, the training practices are based on the postulations of research-training since the training process "focuses on the interaction between research and training practices" (BRAGANÇA, 2012, p.65).

Bragança (2012, p.60) grabs the attention to the need of welding efforts so as to "bring back overcome struggles by triumphant rationality, seeking through individual but socio-historically entrenched actions, alternatives of a more dialogic human development". This understanding points to the urgency of searching for formative dynamics that summon teaching and technical professionals to become protagonists in the actions and deliberations that are engendered in the training pathways.

In the collaborative research, the professionals of the education take for granted the protagonist actions in the process of research-development. Which is why the deliberations come from common objectives and actions collectively decided.

Based on that, when initiating the research actions in the school, we have created a Collaborative Study Group (GESC), which was meant to be a space for initiatives and collaborative actions. The members of the GESC are researchers from UNEMAT, undergraduate bursary holders, CEFAPRO teacher trainers and basic education professionals (administrative technicians - TAE, managers and teachers) of a state school in the public school system who work in the three rounds of elementary education. The deliberations and actions that constitute the guidelines and the proposals of training are collectively decided by GESC members at each face-to-face school meetings.

The proposal consists of deploying the actors involved in the research so that they become jointly responsible for the ongoing educational process, especially because Silva's (2014) research and expertise point out that proposals should not be imposed from the outside to the inside once teachers, managers and technicians, may feel that their fragilities and real needs are not met. GESC is a space where researchers/professionals narrate their difficulties, wishes, needs and the knowledge they need to take hold of in relation to the use of digital network technologies in the educational processes. Above all, through collective thinking and doing, they perceive the pedagogical possibilities of using technologies in educational processes as well as student learning.

The face-to-face meetings were held every fortnight in the school's computer lab, and the remote activities took place via Pedagogical Architectures with the digital support of Internet Social Networks, especially Facebook.

For training actions we take as reference the Pedagogical Architectures understood as a pedagogical design that emerges from the "search for new ways of thinking education" (CARVALHO; NEVADO; MENEZES, 2007). With this understanding, we have adopted the Pedagogical Architecture as part of the actions of the research project which was made possible with the support of Facebook for the prospect of adding multiple activities such as reading, debates, individual and collective productions through the use of digital network technologies to bring about the interaction between theory and practice. The theoretical-practical foundations that support the actions in the classroom and in the distance learning mode focused on the confluence of theories of education allied to the pedagogical use of digital network technologies, with a view to systematising pedagogical and practical methodologies that would enhance students' learning in the classroom.

As data generation techniques, we used a questionnaire with objective and subjective questions at the beginning of the activities of project, so that we could map the learning expectations of the trainees as well as checking their acquaintance with digital network technologies both in their professional and everyday life. The reflexive memorial was another instrument used during the training process. According to Okada (2007), in the learning process, it constitutes an important mechanism for each teacher's self-knowledge. It's a link that allows the approximation between the teacher trainer and the apprentice. Such reflexive memorial is a text for the trainee to register his/her memories, to report the course and the process of ongoing training, in order to problematise the experiences lived in the developmental processes.

As the research activities last three years, in the first one we proposed the following actions: (i) the creation of the collaborative study group (GESC); (ii) mapping the knowledge and experience of school professionals on the use of digital network

technologies as well as learning expectations; (iii) studies and the creation of the Pedagogical Architecture, which functions as a digital learning space, where these professionals perform the training activities in the distance mode; (iv) reading of the theoretical acquis that grounds the formative actions through pedagogical architectures; (v) workshops for learning and technological ownership on the resources and tools of the Linux Educational System and Web 2.0 resources; (vi) study and production of texts in hypertext formats; (vii) writing of narratives in the format of reflexive memorials.

In the first year we had the participation of twenty-six people in the training actions of the project. Of these, six worked as teachers in early and final years of Elementary School; two, at the time, worked as managers; and three as administrative technicians (TAE) of the partner institution. Two bursary holders from the Scientific Initiation Program (PROBIC) and five bursary holders - from now on IDs - from the Institutional Bursary Programme (PIBID), as a part of the Pedagogy course; four teachers/trainers and two technical professionals from higher education (PTES) of UNEMAT and two teachers from CEFAPRO, Juara centre.

For the composition of the *corpus* for analysis, we present a clipping of the data produced by five teaching professionals of the partner school and a teacher trainer from CEFAPRO, through questionnaires and narratives written in reflexive memorials. To name them, these were identified as PE1, PE2, PE3, PE4, PE5 and PE6.

For systematisation and analysis of the data produced by the research, we sought support in the technique of content analysis, based on the guidelines of Bardin (2011) regarding: (i) the phases of previous analysis; (ii) the exploitation of the material; (iii) the treatment of the results, inference and interpretation.

Due to this process, we elaborated the topic entitled courses of immersion and appropriation of digital culture as an analytical category which will be presented in the following section.

Paths of appropriation and use of the digital network technologies under analysis

In this topic, we share some of the data produced by the research. They point out that the process of appropriation and use of digital network technologies were mainly motivated by the search for improvements in professional performance. In view of the motivations and concerns with the improvements in the educational processes of the students, the contextualised training for immersion in the digital culture became necessary, since it has impacted in the pedagogical practices in the classroom. Having said that, it is worth to make clear that the contextualised training based upon the needs and concerns of the professionals of the school demanded protagonist and authorial actions in the routes of immersion and appropriation of the digital network technologies.

The ongoing education of trainees, as the concept itself implies, means a *continuum* that occurs throughout life and career, thus it involves different levels of learning, professional development and processes.

Learning implies motivation, involvement, expectations, reflection, and above all, the ability to question reality and seek to transform it. Goodson (2007) points out

that learning has a direct relationship with life history and with the interests and missions that people take over during their lifelong training trajectory.

For the technological ownership of the apprentices who participate in the aforementioned research project, what prevailed was the motivation for the search for improvement of the pedagogical practice, student learning, professional performance, as they portray the data produced through questionnaires:

PE1: *Since knowledge is unending and that the teacher should look for various means of communication to favour teaching, I am willing to learn more so that I can improve my pedagogical practice (Interview, 15 apr. 2015)⁹*

PE2: *What motivated me to participate in the research project was the expectation in learning new methodologies involving technology and working with these tools to bridge the learning of my students.(Interview, 15 apr. 2015)*

PE3: *It is the constant challenge that we have to associate the digital culture with our methodologies in the classroom, so that the learning process in the school becomes more attractive. (Interview, 15 apr. 2015)*

PE4: *The need and willingness to learn in order to improve my praxis both as a teacher and a trainer in Cefapro. (Interview, 15 apr. 2015)*

The set of excerpts from the narratives highlights that the learning of the trainees is motivated by what might contribute to his professional performance and development. Their main concern has to do with the improvement of their pedagogical praxis and, therefore, with their students' learning.

The excerpts from the PE2 and PE3 signal to the desire of learning new methodologies associated to the use of digital culture resources. This leads us to infer what Silva (2014, p. 57) points out when it comes to ongoing education for the pedagogical use of digital technologies:

[...] The proposal of training actions to use digital technologies assumes a pedagogical model whose focus lies on learning, communication, teachers' and students' technological ownership on digital culture, which is, at the moment, one of the challenges of school, since we live in a society where the massification of education so as to "legitimise" a curriculum centred approach makes no more sense. People's profile has changed much due to the new social demands. Nowadays, just being able to type, to consume information and to reproduce whatever is received, is no longer enough or interesting, once these activities and their necessary capacities are not sufficient for the human development in its completeness.

The author highlights the presence of a new sociocultural movement, *cyberculture*. The manifestation of such a reality, which is now presented to education professionals, implies the understanding of a change in the pedagogical model which is pivotal in education, that is, the understanding of this movement of digital culture requires the need for a new conception of education. Currently, we have to think about education connected to the values that develop in tandem with cyberspace (LÉVY, 2000).

⁹ The interviewed narratives of the respondents were transcribed according to the original content

Seeing education as connected to the values made possible by cyberspace means thinking about interactive communication, sharing ideas, information, knowledge, collaborative learning with the support of networks and digital technologies, as shown in the following fragments:

PE5: *What motivates me is being aware that we live in a network connected society. The fact of being able to know and share experience, participate in a study group on individual and collective learning, knowing different web 2.0 resources, among other challenges (Interview, 15 apr. 2015)*

We live in a society that is structured through a generalised telematic connectivity (LEMOS, 2010) that expands its formative potential, its exchanges of information, the “transformation of communication in learning” (NÓVOA, 2012, p.10). These interactive potentials, made possible by the use of the digital network technologies, should be cultivated at school and at university in order to promote initial and continuous training processes anchored in contextualised developmental practices for immersion in digital culture.

According to Prado and Valente (2002), contextualised training takes place in the workplace where the professional performs his practical activity. When training actions take place in their work environment, they constitute an opportunity for professionals to study and reflect on their own conceptions and practices. These may mobilise peer involvement to perform innovative practices experienced never before.

The excerpt from the PE1 demonstrates their belief in collaborative, reflexive research groups and with everyone’s involvement in the same matter, improving the quality of their learning:

PE1: *[...] I need ongoing training so as to go along with my students. In this regard, as I am aware that pupils are well acquainted and enjoy current technologies, the training process is related to the construction of essential knowledges to teaching. Therefore, I see how relevant is the project Pedagogical Architectures to the Continuing Teacher Education programme: developmental immersion courses in the digital culture when discussing technologies allied to teaching praxis and digital usage in the school context. For that reason I consider of utmost importance learning related to the DNT (digital network technologies), reflexive and collaborative research groups, ongoing collective training with the same purpose, the quality of teaching and learning in school with everyone involved in the project, the School, Cefapro and the University. (Reflexive Memo, 20 dec. 2015)*

Since the beginning of the activities of the project in the school, the main concern was to articulate the theory with the practice in the training processes of the apprentices. Once they were able to grab hold of the technologies, they came to a better understanding of the dynamics of the research-training group, as the extract from PE2 narratives elucidates:

PE2: *The Facebook group “Pedagogical Architectures” becomes a channel of communication that involves the trainees since we can post our thoughts on the study and, at the same time, improve our learning. Particularly, I did not have much knowledge of this technology, and after some accesses, I managed*

to understand how the creation and participation of the group works [...].
(Reflexive Memo, 20 dec. 2015)

As soon as the training started, the intention was the Architectures of Learning Projects¹⁰. However, mapping the training needs of the apprentices revealed that they had neither dealt with Linux Educational Operating System before nor with the productivity applications installed in the computers of the computer lab

Faced with the need of the group, “we started to work with the Linux Educational Operating System, a demand of the professionals that they did not know and had never operated with the applications available in the school equipment” (SILVA, 2015, p.6), as highlighted in the following fragments:

PE1: [...] *There was a great contribution of the meetings of the month of August that emphasised the learning of Linux Educacional and the productivity tools. We started with a brief tutorial on the text editor BrOffice Write on Linux Operating System posted on Facebook. Next, we learnt the particularities of Impress (presentation editor).* (Reflexive Memo, 20 dec. 2015)

PE6: *Even with few computers running, slow internet connection and lack of maintenance, we continued our studies and discussions on the policy of Free Software Educational Linux. We have learnt some uses for the tool hypertexts that allow a jaunt from a context to its peculiarities through images, texts, sound, videos, photos, digital books, quotes, amongst other forms of communication. We dealt with with Impress, another tool available in Linux Educational Operating System 4.0, which allows the construction of slides for oral presentation, formatting messages and the creation of files involving several tools in the same space. [...].* (Reflexive Memo, 20 dec. 2015)

The set of research data indicates that the training activities stimulated the trainees to dive into the digital culture as they began to make pedagogical use of it during the training process as well as incorporated them into their classroom pedagogical practices. The data demonstrate that at the beginning of the project, the research participants had little familiarity with the digital network technologies, mainly with the Linux Educational System and the productivity tools that integrate the *LibreOffice* package.

Linux Educational is a free pedagogical software aimed at public schools with computer labs received under the guidelines of the policies and norms of the National Program of Educational Technology (PROINFO). This operating system includes the *LibreOffice* package, which includes *Writer* (text editor), *Calc* (spreadsheet editor) and *Impress* (slide editor).

The use of these applications were included in the training activities of this programme as a response to the trainees’ request. To achieve that aim, the apprentices were able to take hold of the full potential of these technological resources and were, at the same time, challenged to produce their reflexive memorials in hypertext formats as well as share them on Facebook later.

¹⁰ The architecture of learning projects has its pedagogical and epistemological postulations based on the construction of knowledge by the subject who, by interacting with the physical and social world, manages to build new mental schemas and, therefore, new thoughts on the reality to be assimilated, reflected and rebuilt (SILVA, 2014).

As the assumption that underlies the training paths is the action-reflection-action triad (SCHÖN, 2000), the trainees were instigated to elaborate a proposal to integrate in their pedagogical practices the use of digital network technologies, to develop them in the classroom, and then report the experiences to peers. In other words, the professionals were rallied to recontextualise their learning from the development course into their classroom. Based on that, they were able to share their properly developed and reflected experiences in the space and meetings of the training. Thus, they could reflect and rethink their teaching performance in the classroom and, therefore, the learning processes, since these are paramount conditions for the rise and social inclusion of Basic Education students.

PE1: *With the resources of Impress, I managed to make a didactic transposition with the students of the Multifunctional Resource Room. They learned how to create folder, save images from the internet in this folder and eventually were able to recreate and produce a text from what was read and insert images that they themselves selected from the internet. Thus, we were able to evaluate that the students had learned how to use these technologies, particularly Impress, and produce a text that, at last, culminated in the printing and binding of a children's story book created by the students. At this moment, I reflected on my initial expectations of the training, which aimed at improving the quality of my teaching and helping my students to learn better by the use of technologies. As a result, I was able to confirm that the contributions of the research project were relevant since I learnt how to teach the students with grounded knowledge so as to sponsor the insertion of technologies in their teaching and learning. Thus, I can say that the training favoured my methodological repertoire that is closer to the reality of the current students, considered digital natives. (Reflexive Memo, 20 dec. 2015)*

The excerpts above point out that the changes in pedagogical and curricular practices are inherently related to how much teachers and managers understand the technocultural movement of contemporary society. That is why Silva (2010) shows that today's students are daily immersed in the presented recursion by the emergence of communication and network connectivity. The author also asserts that, as educators, we must be prepared for a critical intervention on the new generations.

Named by the author as new generations or by PE1 as "digital natives", these students daily interact and communicate with anyone, operate these technological resources and live with mobile devices and social networks on the internet without any difficulty at all.

The challenge that continually poses is to understand the potentialities and to study pedagogical strategies of use of digital network technologies in the educational processes so as to promote interactivity in the classroom, to encourage the creation and students' production. Thinking on consumption perspective only, the following extract demonstrates the concern of the use of these technologies by the students:

PE6: *The course has contributed to a review of the pedagogical practice applied to the classroom a great deal so far. Some students do have contact with technological innovation, but they do not know exactly what to do with them, how to create or produce something with it. They use it for entertainment,*

leisure and other ways of immediate pleasure. They lack instigation to strengthen the interest for the exploration of the varied possibilities of learning that these tools offer. (Reflexive Memo, 20 dec. 2015)

As a challenge presented both to school and to teaching professionals, the excerpt from PE6 highlights the need for pedagogical care that digital network technologies deserve when they are inserted into pedagogical and curricular practices. It is necessary for these students to be included in the digital culture, but with the objective of enhancing their abilities of communication, argumentation and (re)construction of knowledge and not to further exclude them from the digital culture. So, Silva (2014) argues that it is paramount for teachers to be aware that the use of digital network technologies, when integrated into educational processes, is conceived under the bias of critical analysis not to incur the exclusion of students. The author further advises:

[...] Integrating these technologies into pedagogical and curricular practices so as to privilege only the development of skills aimed at learning the techniques does not make any sense as regards the emancipation of the students. These are only led to perform “how-to” activities, and are not challenged to think about the “why” of doing. In other words, the human plurality, as regards the distinction both related to identity and difference is not considered, since the conception that guides these developmental practices start from the assumption that all students are identical in their ability to think and act. (SILVA, 2014, p. 76).

Therefore, the great challenge of education and teaching professionals is to provide learning situations in which students perceive the need for engagement, belonging, and become protagonist of their own educational processes. Starting from the social reality of students, their experiences and cultural practices, it is possible to produce knowledge that is unbinding, emancipating and of social quality. According to Silva (2009, p. 225):

The social quality school is the one that looks at a set of socioeconomic and cultural elements and dimensions that are part of the way of living and the expectations of families and students as regards to education; one that seeks to understand government policies, social and environmental projects in their political sense, aimed at the public welfare; one that struggles for adequate funding, for social recognition and appreciation of workers of education; one that transforms all physical spaces in sites of meaningful learning and effective democratic experiences.

Based on this perspective, contextualised training for the appropriation and pedagogical use of digital network technologies assumes protagonist professionals, questioning, research, exchanges of expertise, sharing, authorial and co-authorial production, that is, a development committed to the engagement, participation and improvement of the repertoire of professional knowledge.

Silva (2014) argues that the accomplishment of the training activities in the very school *locus* is far beyond the simple physical transference of space. Its fundamental principle is the redefinition of a new approach in the purposes of training in order to enable professionals to be protagonists in the construction and reconstruction of the knowledge pertinent to their profession, as these are the leverage of changes and progressive improvements of the educational systems.

With such understanding of training, we challenged the trainees to write an experience report in the format of an individual paper to be submitted and, if approved, presented at the 10th Arinos Valley Seminar on Education, an event promoted by the Pedagogy Course of the University of State of Mato Grosso (UNEMAT), University Campus of Juara-MT. The whole process was under the guidance and follow-up of the trainers of UNEMAT and CEFAPRO.

We see as very important the sharing of the work developed throughout the training process as well as the publication of articles resulting from the discussions, reflections and reflexive memorials built by this group of professionals in order to strengthen and legitimise all the work developed by the group. Among the works published in X SEVA we highlight “Reading and Writing with the Support of Digital Technologies: an experience with students of the 2nd cycle of basic school” and “Technologies and Multiliteracies: an Experience with the use of Digital Games and Teaching Practice” whose authors were the teachers of the school that homed the project. These present partial results of a work developed with language students of the 2nd stage of the 3rd cycle of elementary education, thus developing strategies to approximate texts using virtual games as a tool. In addition, these articles indicate that some concepts and tools were appropriated by teachers, because it is only when used in their teaching practice that we realise how much sense it makes for them.

PE1: In the meetings of October and November the writing of scientific productions among the participants of the course with collaborative partnerships for presentation in the X SEVA - Seminar of Education of the Arinos Valley with articles for publication and presentation in the form of Individual Papers was prioritised. At the moment, I wrote the article “Multiliteracies in the Perspective of the Literary Child’s Genre in the Specialised Educational Assistance”. It was relevant since I was able to highlight in writing all work of my research, learning and teaching in the perspective of improving my methodologies with the insertion of technologies. So, the project allowed me a better performance in the classroom and, consequently, favoured a considerable development of the interest of the students once they need differentiated methodologies and concrete materials so that learning can happen. (Reflexive Memo, 20 dec. 2015)

The excerpts from the narratives indicate that digital network technologies open up a range of possibilities on how human beings, in our case education professionals in the process of ongoing training, by interacting and communicating with the support of contemporary digital network technologies are instigated to design, to create, to invent, to discover as well as to produce new forms of subjectivities so as to generate interactive processes of creation and collaborative authorship that allow knowledge share and, above all, to lead our own life histories and development. (SILVA, 2014).

Final thoughts

Ongoing education, seen as a legal right of learning of education professionals, does not take into account actions that value their training needs. In view of this principle, the inter-institutional research project was modified in its original version to the detriment of the expectations, concerns, needs and challenges that emerged from the pedagogical practices engendered in the classroom.

Mutual concern and collective actions converged to provide contextualised training in the meetings, because it privileged expectations and the apprentices' protagonist and authorship in the process of grabbing hold of the pedagogical use of digital network technologies. That was also an action conducive to continuity since learning and training are ongoing processes that continue throughout life. The training for appropriation and immersion in the digital culture understood as a continuous action of learning postulates developmental activities that allow experiences closely related to the pedagogical and curricular practices held in the classroom (SILVA, 2014).

Qualitative data produced by the research indicate that the professionals had good receptivity, effective participation in the decisions of what to study and how to interact with digital network technologies to achieve their own expectations inherent to the pedagogical practices promoted in the classroom. The face-to-face and distance learning meetings were interactive spaces conducive to dialogue, sharing the learning narratives of the teachers and the students themselves.

Every ongoing training programme is not a simple task. The setbacks along the way were inevitable. We have had several difficulties related to internet connection, scrapping of the machines in the computer lab of the researched school and the lack of proper maintenance of these equipments.

In spite of these mishaps, the data produced by the research elucidate new challenges to be addressed in terms of the need to intensify the underlying theoretical, conceptual and methodological studies of the architectures of learning projects in the ongoing education routes. It serves as a possibility to rally new reflections, appropriation of the digital network technologies by the professionals involved and, from this immersion, mobilise actions for the creation of pedagogical proposals that privilege educational processes, oriented to the effectiveness of practices of digital inclusion of the students in the school. This digital inclusion assumes pedagogical activities that enhance the prominence and collaboration between students and professionals of education in the production of knowledge, in order to transform the school into an environment of permanent learning that uses the digital network technologies for the formation and social emancipation of the school community. That is a very complex challenge, but it is possible when we try to create continuous developmental activities in which teachers take up the condition of researchers in the process and are trained and transformed once their own praxis is the object of analysis and reflexive considerations.

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