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Abstract. This paper presents research results about online distance technical courses. The aim of the research was to analyze the online pedagogical practices developed as the need for technical training of each course. The main question was: Is it possible to develop technical training at a distance? We followed four different distance technical courses in three different regions of Brazil. The results indicate that for comprehensive training of professionals (technical, cultural and moral), distance technical courses should be actually hybrids: a combination between online (20 up to 50%, depending on the technical axis) and face to face. It was pointed out that the face-to-face classes need to be more useful with practical classes than just for evaluations, as it is in Brazil. Also, tutors need to be teachers. Finally, a course organization is proposed to make possible develop such classes and monitor the students by a shared teaching.
Keywords: distance education; distance learning; vocational courses; mediation; technical courses.

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Дистанционное техническое обучение: результаты опыта в Бразилии

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Аннотация. В статье представлены результаты изучения эффективности дистанционно-технологического обучения в образовательной практиков Бразилии. Приведены результаты анализа преподавательской деятельности онлайн, в том числе при технической подготовке к преподаванию различных предметов. Целью статьи является ответ на вопрос – возможно ли осуществить техническую подготовку и качественное обучение дистанционно? Авторами проанализированы четыре различных дистанционных технологических курса в трех регионах Бразилии. Результаты исследования показали, что качественная дистанционная подготовкаспециалистов (как технических, так и гуманитарных направлений), проходивших обучение по соответствующим курсам, возможна при комбинированной форме обучения: пропорция между онлайн и аудиторной учебой должна составлять от 20 до 50% в зависимости от направления подготовки. На основе проведенного исследования установлено, что аудиторные классы более полезны для практических занятий, а не только для оценки знаний, как это принято в Бразилии. Кроме того, тьюторы, ведущие курсы, должны быть специалистами в преподаваемой области, иметь педагогическое образование. Курсовая организация комбинированного обучения создает наиболее оптимальные условия для получения качественного дистанционного образования.

Ключевые слова: дистанционное образование; дистанционное обучение; заочное обучение, профессиональные курсы; посредничество; технические предметы.

Introduction. In Brazil, since 2002, Technical Professional Education has been the focus of government policies and, for that reason, its offer has been expanded throughout the country. Despite the stimulus to expansion, Brazil is a country of great dimensions and geographical differences and so there are still many regions without schools that offer a free qualified public professional education. For this reason, since 2007, the provision of distance technical education was regulated through the creation of the *Rede e-Tec Brasil Program*.

In recent years, distance technical courses have increased their offer of 8% per year, representing 11% of distance learning in Brazil[1].

Despite this, since the first courses in 2007, they have not been evaluated, of any kind, by the government. Thus, from the perspective of a pedagogical evaluation, this article brings results of a research that proposed to accompany four technical online courses from the federal network. The objective was to verify their training possibilities, considering that it is recommended in Brazilian official documents that technical professional training should offer integral training (professional, civic, moral) to its students[2].

[1]Brazilian Association of Distance Education. Census EaD.br: Analytical Report on Distance Learning in Brazil 2014. Curitiba: Ibpex. 2015. Brazil. URL:

http://www.abed.org.br/censoead/censoEAD.BR_2012_pt.pdf

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Having been verified by the research data insufficient proposals, mainly for the dimension of the technical training made at a distance, we invested in a large bibliographical study that, concatenated to such data allowed us to present a pedagogical proposal based on the concept of hybrid education aiming to attend the integral formation without prejudice to technical training. In the following sections, we present the results of the research and its proposal in a detailed way.

Integral human development and its relationship with teacher mediation. In human development, according to Vygotsky (Vygotsky, Luria, 2007), "cultural development overlaps with the processes of growth, maturation, and organic development". Human development is socio-historical and cultural according to its insertion and participation in social practices, especially in the formal educational processes that act intentionally on the formation of the individual. In the intentionality of the teaching processes, what makes special difference is the teacher mediation.

The integral development of the individual is characterized by the articulated development of its intellectual and behavioral capacities, that is, the acquisition of technical-scientific knowledge and their corresponding cognitive capacities. From the articulation necessary for higher levels of human development, even with technological diversity, the one who has the professional knowledge and authority to do so is the teacher, that is the professional of education, because it is predominantly a process of social relation.

Vygotsky explains that "[...] culture gives rise to specific forms of conduct, modifies the activity of psychic functions, builds new levels in the system of developing human behavior," and this edification itself is shaped by means of a "living" teaching process, which "... must be the subject of a real scientific study" by the student. For this reason, it is that the teacher, according to his mediation, makes a difference in the development of the student (Vygotsky, 1931).

Research, by Vygotsky School, shows that intelligence is not innate and no longer reaches higher levels by keeping itself only with the students' everyday knowledge. Rather, it takes intentional action, directed toward the development of dialectical thinking. In every step of education "... theoretical thinking does not arise nor develop in people's daily lives, it develops only in such an instruction, whose programs are based on the dialectical understanding of thought. It is precisely this teaching that has the developmental character" (Davydov, 1988). "Cognitive development is manifest not only through acquisition of knowledge, but also through its inclusion in the exercise of intellectual procedures such as logical thinking, observation, remembering and imagining" (Guseva, Soshowski, 1997: 16).

This means that, in the perspective of Vygotsky's Historical-Cultural Theory, the teacher must prepare a teaching in which the student participates in an investigative way according to the logical-investigative characteristics of each area.In this line, the activities that are part in the teaching-learning process should be problematized, contextualized from real examples, including, since the beginning, forms of activities in which students can research, reflect, analyze, suppose, simulate, organize and record their reasoning, among other verification and exposure actions, so that they themselves can construct the concepts. "The teacher directs student's attention and leads them toward finding the existing connections and dependencies themselves. Students are led toward explaining specific dependencies and making conclusions" (Guseva, Solomonovich, 2017:779).In addition, activities should take place starting from collective to individual, from spontaneous research to oriented actions, until learning objectives are reached, as illustrated in Fig.:
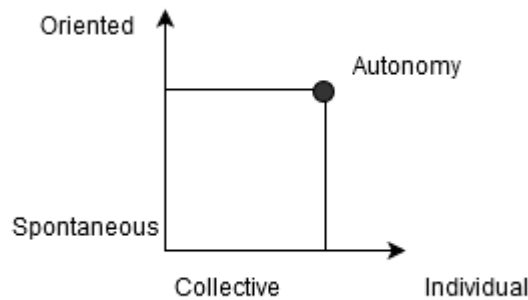
Fig. Example of autonomy development.
Рис. Пример развития самостоятельности.
Source: Theauthors.

In the course of the development of the activities, there should also be questions in order to stimulate reflections which are responsible for orientating the actions regarding the object of study. The role of the teacher should therefore be to monitor and intervene, in order to direct the student in the transformations with the object until the student is able to appropriate it and to develop the activity autonomously. Autonomy is built according to the participation in socio-cultural practices. It is not innate. So it is not because a person is an adult that he/she is autonomous (Costa, Thereza, 2015: 91-100).

In this way, teacher mediation, although planned, is not a previously fixed action. It is part of a planning that should be flexible, so that while he assists the students and verifies their understanding, the teacher proposes activities that lead students to overcome the gaps and difficulties diagnosed until they master the knowledge. Didactic mediation is a process of monitoring and pedagogical-cognitive intervention composed of actions, observations and intentional statements of the teacher, dependent on the students' participation so that they can succeed.

Within this type of education, emancipated, it is essential that the teacher develops a pedagogical-didactic mediation, that is, that deals, at the same time, with the student's relations with the knowledge and their social relations arising in the process and"the need to develop rules for the use and norms of the ethics of "computer behavior" (Guseva, 2008: 171). According to Lenoir, learning is inseparable

from the relationship of mediation and implies a practical and regulatory interactivity between the learning subjects, the object of study, norms in general and an individual socially invested of mandate, that is, the teacher. For this author, it is not possible to reach such superior levels or articulate an integral formation without a specifically planned teaching action. Cognitive development is a guided process which, for the purposes of intellectual emancipation, "... requires pedagogical-didactic mediation, mandatory for unleashing a relation of cognitive objectification of scientific character", and consequently, the integral formation of the individual (Lenoir, 2014).

Several other studies show different levels of students' appropriation of knowledge according to the teaching performance (Bressoux, 1994; Cusset, 2011; Guseva, 2011: 23-27; Guseva, Lakhmostov,2015; Nye, 2004: 237-257). Cusset also asserts that the differential comes from the way the pedagogical-didactic relationship is concretized in the process. Thus, the mediation of the teacher, as a human being invested with professional knowledge and authority, is a differential factor, since he is responsible for intentionally conducting the teaching-learning process.

Instrumental teacher mediation. Lenoir characterizes the instrumental type of teacher mediation due to the preponderance of actions restricted to the resolution of operational conflicts, resource sharing and negotiation procedures, to the detriment of a regulatory and auxiliary teaching activity focused on student learning. Such mediation is centered, above all,

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on the operative dimension of the mediating action and on the adoption of the idea that teacher mediation is neutral, that is, not related to the formation of students' behaviors and opinions (Lenoir, 2014).

Instead of focusing on the student's degree of learning and positioning itself as neutral, instrumental teaching mediation has the socio-educational purpose of not contributing to a formation that emancipates individuals in a socio-intellectually way. By having neutral positioning, the teacher does not intentionally act in order assist the student to advance to higher levels nor to correct and teach social behavior, leaving the formation to the student's dedication. This posture directs formation to something reduced to training linked, at most, to low complexity technical competences, as it neglects the analytical, critical and contextualized dimensions of the training.

Thus, this perspective of teacher mediation addresses the problems that arise in the teaching-learning process such as problems of intellectual incapacity or lack of student´s dedication, since the teacher is not responsible for teaching.

The pedagogical-didactic teaching mediation. The pedagogical-didactic teaching mediation that guides the student towards integral development is fundamental to dialectical logic which means that "it rests on the ontological postulate that every human being is constructed collectively by building with one another the reality in time and in space and aims at some form of social emancipation" (Lenoir, 2014).

Lenoir explains that the role of pedagogical-didactic mediation includes, in addition to cognitive and moral development, the affective dimension related to the importance of the social role of the subjects involved in the teaching-learning process and inserted in a society. In this perspective, this author calls the "powerful mediator" (op. Cit.), the desire (Lenoir, 2014). The desire of each one for the knowledge is born from the desire expressed and socially shared and is renewed in relation to the social recognition, and the teacher has a center role in it.

In this logic, the concretization of educational-didactic mediation in educational processes necessarily requires conditions that allow the construction of pedagogical social relations based on activities with dialogues, reflection, manipulation and collective and individual productions. Thus, pedagogical-didactic mediation extrapolates actions of negotiation, technical assistance and information communication. Such mediation corresponds to a network of integrative and regulatory actions that occur along the path of the pedagogical social relation, intentionally planned with contents in activities whose nature is scientific, in order to lead students to an articulated intellectual, affective and moral development.

Lenoir considers such mediation an educational intervention because it triggers intellectual changes in the subject until he reaches the desired goals. In this sense, pedagogical-didactic mediation is characterized by a set of intellectual interventions, dialectically constructed, based on the objectives of teaching, working conditions and the various forms of participation (Lenoir, 2014).

The methodological path of the research. This research is characterized as a multiple case study (Gil, 2002), since it analyzes courses from three different schools. We used the central categories of the historical-dialectical materialism method as an analysis guide: contradiction, mediation and totality (Cury, 1986).

Four technical distance courses of the federal public network were surveyed in three renowned schools at a technical level in different regions of Brazil. The courses analyzed were: Technical Course in Informatics (South Region, Southeast Region), Technical Course in Environmental Management (Southeast Region) and Technical Course in Sugar and Alcohol (Central-West Region).

The data was collected from the documental research of current legislation for professional technical education, pedagogical projects of the courses, records of classes in synchronous and asynchronous tools (Forums and chats) of the virtual environment used, tasks, evaluations, and Coordinators (7), teachers (7),

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tutors (5) and students were also interviewed (46). On-site visits were also made in order verify the infrastructure and activities carried out at the poles, as detailed in Costa (Costa, 2015). For this article, we will focus only on pedagogical-didactic data.

Results and discussions. Regarding the campus, which should support and complement the pedagogical and administrative actions carried out online, they meet only the students´ demands concerning administrative services. As for the pedagogical assistance for dealing with task-solving problems and to perform specific classes for professional practices to complement the training, the provided service is precarious and the most stated reason is the fact that the tutors do not have specific knowledge regarding the subjects. The only criteria required to hire them is high school level. The tutors are supposed to assist the student in different subjects. Even when they are teachers, they do not work according to their under graduation majors.

As for the courses developed during the course, complementary socio-cultural and scientific activities, technical visits, laboratory practice classes and socio-environmental and human training disciplines were eliminated. One of the courses eliminated even the internship. The classes found for these courses had around 50 students per campus, which means that one single teacher/tutor was responsible for assisting at least two hundred and fifty students.

Only one of the courses provided a weekly meeting in campus so that students could have a videoconference lesson with the teacher of the subject. This same course also offered weekly chat with the teacher himself/herself. This course was the only one not to have an evasion level higher than 25%. All the others had a level of evasion from 36% to 49%.

The students also stated that they need content assistance with the teacher, more practical classes and appointments within a short notice. Teachers complained about the excessive number of students per class and the fact that the tutors did not have a major in the field of the course as vehement problems. For these

reasons, they had to change their lesson planning to objective and individual activities which didn´t require the frequent use of labs.

Some tutors have said that they felt unhelpful because they couldn´t help students in solving the exercises. They also stated that teachers took too long to answer their questions and for that reason they weren´t able to promptly solve the students´ doubts. Both teachers and tutors stated, during interviews, that if tutors were hired by area, they could help a lot more in student learning and they could assist students online and face-to-face. Consequently teachers would not have to restrict their lesson planning to objective activities.

Based on Lenoir's concept of pedagogical-didactic mediation, it can be affirmed that the constant restriction to objective activities and the lack assistance and regulation of activities by a professional invested in knowledge do not support activities that can develop reflection and analysis for students' cognitive development. It's all about reading the material available, memorizing and answering the questionnaires (Lenoir, 2014). There is an intense impoverishment of the teaching-learning process, which, combined with the elimination of practical activities, does not only affect the integral formation of students, but also produces vulnerable technical training.

When we take into consideration what Vygotsky and Luria (Vygotsky, Luria, 2007), Davydov (Davydov, 1999) and Lenoir said on the role of desire for studying, will and desire are underestimated when we disregard the affective dimension of social relations that occur through the various forms of communication (Lenoir, 2014). Thus, we´ve come to the hypothesis that high rates of evasion in these courses might be linked to the students´ feeling of non-accomplishment, because they feel abandoned and are aware of the their insufficient learning, and that influence their confidence in the course. Although the dominant discourse diffuses the idea that being autonomous is enough to adapt oneself to a distance course, the statements show that cognitive-affective needs permeate the teaching-learning process and, when these needs are not sus-

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tained, they may trigger feelings of neglect and disregard.

These testimonies indicate the occurrence of instrumental teacher mediation. On the other hand, they show that the teacher mediation found, mediated by the physical and pedagogical work conditions, especially the number of students and the untrained tutor, could not culminate in a different situation. The current adopted model itself does not create conditions for teachers develop an effective pedagogical work neither in the online environment nor in the campus (Costa, 2015). The tutor-teacher relationship that was supposed to be complementary, it becomes disconnected. The current model of distance technical training in Brazil, therefore, does not correspond to the recommended goals presented in the official documents regarding integral formation.

It is important to remind that when searching for the emancipation of the human being, "... mediation cannot be reduced to some technical and instrumental dimensions" (Lenoir, 2014), the possibilities for a wide development of workers who attend these courses are small. Thus, if on the one hand we can find a certain democratization of access, due to the temporal and flexible access, on the other, it is clear that it is a questionable democratization since it does not deal with the qualitative dimension.

Conclusions: a prospective vision for distance education courses. Based on this research, the need to rethink the current model of distance education (DE) in Brazil is evident, since the technical courses are necessary both for regional development, reflecting on the country's development and as a means of professional satisfaction for the citizen.

Regarding the online teacher mediation, it was pointed out that their teaching attempts, in the distance technical courses of the federal network, do not correspond to the full training recommended in the official documents and even the technical training is questionable. On the other hand, it has also become apparent that, as long there is socio-technical relationship established among students, teachers and

technologies, pedagogical-didactic mediation possibilities exist.

This research showed that the central problem that affects most distance courses in Brazil, quality complaints and the high dropout rate, is not the physical separation between the subjects, as this can be overcome by the technological means integrated with an organization Curricular-pedagogical framework that provides conditions for rich pedagogical practices. The problem is the disarticulation of these elements, focusing on cheaper structures that provide minimal conditions for teachers perform their lessons. According to Libâneo (Nye, 2004: 237-257), the quality of educational processes lies in how teacher mediation integrates cultural and technological mediation, etc., to help the student to move forward. Thus, it is necessary to invest in teachers and their working conditions in distance courses.

Regardless of the communicative potential of information and communication technologies (ICT), for their pedagogical use, they are dependent on the teacher's pedagogical posture that also depends on training. ICTs themselves cannot meet the human needs that permeate the teaching-learning process. Therefore, many negative feelings regarding the monitoring and care of the students were revealed. These results sustain the assertive that the curricular structures of the courses that have few face-to-face meetings should contemplate regularity and quality in the online meetings. The cognitive-affective needs that can only be mitigated from regular pedagogical social relations are natural to the teaching-learning processes and the response to them will fuel the desire to learn and stay in the course. This includes monitoring by teachers. We understand that the way tutoring currently takes place in the structures presented does not meet the demands of the students, as they need teachers with specific training both for online demanded questions and for face-to-face activities at the campus. In addition, although the national documents have included the term tutor as dissociated to teaching, the surveys (Costa, 2015; Tonetti, 2012) show that they are engaged in teaching and teaching activities. This change of nomencla-

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ture is an artifice for the precariousness of the teaching work and, consequently, its remuneration. The lack of professional supervision leads to the procrastination of online assistance, students' demotivation, the underutilization of the campus as a complement to the teaching-learning process with practical technical activities and, consequently, insufficient training for students. Therefore, it would take a set teachers working together to provide any kind of pedagogical assistance.

According to the data we found, we propose an approach that we call integrated shared teaching (Costa, 2016: 517-525). This term was proposed taking three aspects into consideration: the concept of pedagogical-didactic mediation, the influences of hybrid education research (Hom, Staker, 2015) and legal studies on shared guarding[1]. Hybrid education, in general, refers to models that use articulated face-to-face and virtual moments to compose the course schedule. So it would be neither distance nor face-to-face, but both at the same time. The term represents the need to incorporate online moments in face-to-face education (Hom, Staker, 2015), but today it is used for the opposite as well: online distance learning can be embedded in face-to-face moments in order to explore what is best under these two conditions. As a result, we take advantage of the importance of exploring the diversity of technologies and training spaces in order to carry out quality online education processes, which has been difficult to do when completely online.

The concept of shared custody in Brazil refers to "joint responsibility and the exercise of the rights and duties of the father and mother who do not live under the same roof, concerning the family power of their children". That is exactly what we are talking about in teaching. We have found that it is necessary to share the responsibility of teaching between a teacher who attends online and another face-to-face, in an integrative way, that is, it is not a question of sharing tasks, but instead both should com-

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[1]Brazil. Law № 11.698, June/13/2008. It establishes and disciplines shared custody. Brazil. URL: http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2008/Lei/L11698.htm

plement the pedagogical supervision of one another concerning the teaching-learning process that takes place at a distance in order to help the student to learn.

One possibility for shared teaching be made possible is to change the pedagogical and curricular structure of the courses to a set of smaller courses that compose the student's formative itinerary. Groups of subjects that constitute shorter formations that we call intermediate terminalities or formative itineraries. This allows the group of courses being executed to have a similar training core. From this, it is possible to have a teacher with training in the main area of the group of subjects being executed to follow the activities of the students. In addition, considering that each course works with at least three campus, the teachers of each campus can be selected according to the necessary complementary areas, since they will share the online mediation, complementing the other's gaps so that all the needs of the solved.

In order to share AVEA's online space for shared and complementary didactic mediation, even if a teacher is responsible for the subject, shared teaching makes it possible to improve assistance to doubts in time and quality of response, the activity supervision, the construction of the following tasks and face-to-face activities in campus.

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