

## SCHOOL LEARNING IN CYBERSPACE: DISPUTES REVEALED BY STUDENTS FROM JUNIOR HIGH SCHOOL<sup>1</sup>

APRENDIZAGEM ESCOLAR NO CIBERESPAÇO: CONTROVÉRSIAS REVELADAS POR ALUNOS(AS) DO ENSINO FUNDAMENTAL

APRENDIZAJE ESCOLAR EN EL CIBERESPACIO: CONTROVERSIAS REVELADAS POR ALUMNOS / AS DE LA ENSEÑANZA FUNDAMENTAL

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### ABSTRACT

This article analyses the disputes revealed, by students from Junior High School associated with their learning through cyberspace. This article is based on Bruno Latour's Actor-Network Theory and Lúcia Santaella's studies on reader subjects. The methodology used was a qualitative case study, and the data was collected through the focus group technique. The analysis of the results is based on the disputed revealed by the students identified as immersive and / or omnipresence. The main results reveal that students would like to be more "heard" in school spaces, to be acknowledged during their learning processes.

**Keywords:** Cyberspace. Actor-Network theory. School learning. Student. Immersive reader and omnipresence reader.

### RESUMO

Este artigo analisa as controvérsias reveladas, pelos alunos do Ensino Fundamental, nas associações de aprendizagens escolares que realizam no ciberespaço. É fundamentado na Teoria Ator-Rede, de Bruno Latour, e nos estudos de Lúcia Santaella, sobre os sujeitos leitores. A metodologia utilizada foi um estudo de caso de cunho qualitativo, e os dados foram coletados por meio da técnica de grupo focal. A análise dos resultados foi realizada a partir das controvérsias reveladas pelos alunos identificados como imersivos e/ou ubíquos. Os resultados revelam que os alunos gostariam de ser mais ouvidos nos espaços escolares, e se sentirem protagonistas de seus processos de ensino e aprendizagem.

**Palavras-chave:** Ciberespaço. Teoria Ator-Rede. Aprendizagem escolar. Aluno. Leitor imersivo e leitor ubíquo.

### RESUMEN

Este artículo analiza las controversias reveladas, por los alumnos de la Educación Fundamental, en las asociaciones de los aprendizajes escolares que realizan en el cyber-espacio. Este artículo esta fundamentado en la Teoría del Actor-Red de Bruno Latour, y en los estudios de Lúcia Santaella, sobre los sujetos lectores. La metodología utilizada fue un estudio de caso cualitativo, y los datos fueron colectados por medio de la técnica de grupo focal. El análisis de los resultados fue realizado a partir de las controversias reveladas por los alumnos identificados como inmersos y/o ubicuo. Los resultados revelan que a los alumnos les gustaría ser más escuchados en los espacios escolares, y sentirse protagonistas de sus procesos de enseñanza y aprendizaje.

**Palabras clave:** Cyber-espacio. Teoría Actor-Red. Aprendizaje escolar. Estudiante. Lector inmerso y lector ubicuo.

<sup>1</sup> This text is a translated and revised version of the article "*Aprendizagem escolar no ciberespaço: Controvérsias reveladas por alunos(as) do ensino fundamental*" from Daine Schlieck and Martha Kaschny Borges. The revision and translation of this text, were made by Sandra Barzallo, Master's degree on Education student

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## INTRODUCTION

The current educational moment is characterized by deep and constant changes. Educating students today requires new ways to promote education, to conceive knowledge construction, new educational practices that integrate digital technologies - DT in the educational processes, enabling students to appropriate knowledge into a more collaborative and meaningful way.

The digital technologies play a prominent role in the transformation movements of relationships between subjects, its knowledge, and its use, include resignification processes and mental adaptation schemes mobilized by subjects when they use different instruments at their disposal. (BORGES, 2007).

Encouraging the use of DT in schools enable the subjects, to gradually recognize themselves as the main characters of their teaching and learning process, thus, they can establish more meaningful relationships with knowledge. Knowing and understanding the students, the way they see and how they organize their thoughts with TD arrival, it is important in that way we can discuss the changes that this might cause in the school. Access to information is facilitated and

[...] the school is no longer the only place to legitimize knowledge, since there is a multiplicity of knowledge that circulates through other, diffuse, and decentralized channels. The diversification and diffusion of knowledge, outside of school, is one of the strongest challenges that the communication world is presenting to the education system (MARTIN-BARRERO, 2011, P.126)

In this context, the research that we present in this article reveals that navigating in cyberspace requires new ways of looking at the knowledge construction, new ways of reading, writing, and sharing knowledge; It requires the creation of new learning situations that guide the navigation and promote the necessary connections for students to make that knowledge their own.

The research main objective was to analyze the controversies revealed by immersed students and by omnipresent students regarding the associations they make in cyberspace related to their school learning.

For this reason, the research subjects were students who have the immersed and omnipresent<sup>4</sup> characteristics, based on the studies carried out by Lucia Santaella (2004,2013). The research development in which the subjects are children or teenagers, who can go beyond of just giving a voice to a little-heard age range and allow a better understanding of contemporary educational reality.

The research was conducted by a qualitative case study and was developed with eight students from seventh grade from a Florianópolis / SC Municipal Education Network school. The methodology used was divided into two main moments: the application of an online questionnaire, for twenty-nine students of a class, with the aim of identifying the cognitive profiles of these subjects, and the realization of a focus group with eight students identified as students / immersed and omnipresent readers, our main target audience. From the focus group we identified four controversies that were described and analyzed according to theoretical framework of TAR.

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<sup>4</sup> These concepts will be deepened throughout the text.

## THEORY AS MEDIATION

The author Bruno Latour (1994, 2012, 2016), based on the reflections made by him and his colleagues Michel Callon and John Law when they were working on founding the Social Studies of Science and Technology (ESCT) group, praises the importance of doing research about the associations that humans and non-humans make, since both are considered potential transformation agents.

These authors developed the - Actor Network Theory - ANT, or the Actor-Network Theory - TAR - which aims to analyze the associations established between actants<sup>5</sup> in a network. Network that can be understood as the existing connections between the actants involved that interfere, influence, and even modify the behavior between them, depending on the associations they establish.

Using Latour's words (2012, p15), ART seeks to dissolve the dichotomy that exists between the human and the non-human, it seeks to "[...] bring non-humans to the sociological debate center, assume that they are gifted and that, consequently, they are actors with full rights that allows us, without a doubt, to understand the human being even more".

According to Latour (2012, p. 112-113),

[...] An action with different force types united because they are different. Thus, from now on, the word "collective" will replace "society." Society will only be the set of entities already gathered that, according to sociologists, were made of social material. Collective, on the other hand, will be designated to the new entities project not yet reunited and that, for that reason, are obviously not made of social material. [...] The course continuity of an action rarely consists of connections between humans (for which, otherwise, basic social skills would be sufficient) or between objects, but with a higher probability, in a zigzag fashion between one and other.

For the TAR, the actants roles are not fixed, it's the associations that they establish with the group and what results from them, which deserve to be observed and described, because they are those associations that keep the group in motion, that help to develop actions and transport translations<sup>6</sup>. And it doesn't matter who is responsible for the movement, the important thing is that the movement happens. The collective is made and unmade and made again from the relationships developed between humans and non-humans.

While conducting our research, we were able to realize that TDs are important actants in the students teaching and learning process. Students use them to make associations related to the curricular content. They navigate in the cyberspace, among the information found, they make the associations needed to make them their own, along with the contents. We will talk more about those matters in the results obtained.

With the TDs arrival, knowing and understanding students and the alterations that occur in their lifestyle and in the way they organize their thoughts and act on the world becomes essential to make effective educational practices consistent with their new forms of learning. In this way, we

<sup>5</sup> Term borrowed from Greimasian semiotics. It means everything that generates an action, that produces movement and that helps to identify, which can be human or non-human (LEMOS, 2013. P.42)

<sup>6</sup> "Translating is at the same time transcribing, transporting, dislocating, transferring, and, therefore, transporting transformed" (LATOUR, 2016, p.30).

can discuss the meaning of this changes to the school and for the students learning process immersed in cyberspace.

The TDs use is becoming more and more omnipresent. We can use them anywhere and anytime. The internet, allied to hypermobility<sup>7</sup>, facilitates access to the cyberspace, in which information is available and diversified, promoting new ways of interacting with and in the world, new ways of processing culture, cyberculture (SANTAELLA, 2013).

In 2004, Lucía Santaella carried out an investigation on technologies and hypermedia<sup>8</sup> and how it has been modifying the cognitive profile of the reading subjects. These developed a new way of reading and, even, of organizing the thoughts. She identified and characterized three reader profiles: the contemplative / meditative reader; the moving / fragmented reader, and the immersed / virtual reader.

The first cognitive profile that the author identified was the contemplative reader, the printed book reader, and the fixed image, characterized by the silent reading of a book or by the solitary contemplation of a painting. This reader emerged from the sixteenth century, a period in which reading was linear, individualized and where information was sought in a library, his favorite place.

The second was the reader in motion, of the world in motion, dynamic, which emerged with the newspaper and advertising. He reads images on TV, in outdoor advertisements and his interest in information is equal to the time that she is handled in the press, cutting out reality.

The third type of reader was the immersed / virtual one, which emerged with the internet arrival. He is the reader of hypertexts, and hypermedia, freely navigates between the nexuses of cyberspace and becomes author and co-author in his reading process and in his information searching. For the immersed reader, reading is multilinear. With just one "click", it brings new information to your reading, be it through another text, an image or even through a video. (SANTAELLA, 2004)

When characterizing the immersed reader cognitive profile, the author made a distinction between the user types who navigate in cyberspace: the beginner, the standard, and the expert. The beginner user is the one who needs help to find what they are looking for, the standard user is the one who already knows how to navigate in cyberspace, but only performs specific actions already memorized, and the expert user can be defined as one who can navigate and perform precise actions.

In 2010, almost ten years after beginning his studies about readers cognitive profile and about TDs progression, especially mobile technologies, Santaella characterized a fourth type of reader: the omnipresent reader. This arises with the development of mobile technologies, with hypermobility practices and today's society hyperconnectivity characteristic. This subject learns by moving, at any time and in any place with the help of a mobile device, with his Smartphone. The omnipresent reader is free to create and follow their own navigation routes between the physical and the virtual (SANTAELLA, 2013).

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<sup>7</sup> "[...] interstitial space, hybrid and mixed space." (SANTAELLA, 2013, p.21)

<sup>8</sup> Hypermedia is the "junction of hypertext with multimedia, that is, precisely the language with which we deal when we browse the information on networks." (SANTAELLA, 2013, p.31)

In short, it was in these studies, mentioned above that we based our choices and listen to the students who would participate in the focus group of our research. We prioritize the students who were practically born immersed in cyberspace, that is, those who navigate easily, those who are already subsidized to create the necessary partnerships to learn and complement their formal education.

We were listening to those immersed and omnipresent students and we realized that the teacher is still essential for their process of knowledge appropriation. As much as the students are investigating, and discovering, on their own, alternatives to understand better the curricular content presented, they continue to have, in the teacher's figure, the actant who possesses the scientific and socially "valid" knowledge. They ask the teacher to confirm the veracity of the information found.

We believe that it is at that moment that translation takes place, since the translation process of the composing new meaning continuous process according to the situations that arise and how they are presented. And in which they ask the teacher if the investigated information is correct and the teacher reacts by responding, discussing the matter, it is an opportunity where the students transform the information into knowledge.

Making the teaching and learning process more dynamic, participatory and collaborative, enables the student to learn by doing, drawing their own navigation routes, obtaining greater autonomy in the information searching, in the knowledge sharing and in the knowledge production (SANTAELLA, 2004). Nowadays, we notice that students, from the youngest ones, have new understandings and profiles, which necessarily cause changes in the school. In an interview with Santos (2015, p.246), Michel Serres highlights that,

In education, before, there was hardly a word - someone who sang or spoke, and it was necessary to repeat what he said. From the moment that writing was invented, each student could have before his eyes some record of what was taught. Then the pedagogy changed, the school changed, from the moment that writing existed. Obviously, the school completely changed when the book came out. For example, it is said that, in the Reformation period, Luther affirmed "every man becomes a pope with a bible in hand." After the book, the pope was no longer necessary, if it was directly linked to God. Therefore, observe that everything is modified with writing, reading, etc. And Thumbelina's digital stuff. On the other hand, the idea that makes up a pedagogical relationship between teacher and student is constant in history. The teacher can be a poet, a singer, a teacher, etc. The support was permanently modified, the written support, the book support, or the digital support.

A new educational practice is necessary, in which students, teachers, and DT associate in networks to have access to information and translate it into knowledge, appropriating DT in a significant way and becoming protagonists in cyberculture, that new space that is "[...] the result of new forms of social relationship [...] of new forms of social enchantment [...] mixing technology, imagination and sociability [...]" (LEMOS, 2015, p.266-267).

From the associations we make when we interact with different networks actors we belong to, it means that we are becoming actants as well, and mediators as well, and we are transforming and transforming those networks too.

## MAIN RESULTS: THE STUDENT'S WAYS OF LOOKING TO THEIR REALITY

According to the TAR, the researcher is an important spokesperson for the investigation, since he speaks for all the actants involved, when collecting and describing the movements made in the networks. "It is as if we said to the actors: We are not going to try to discipline them, to fit them into our categories; we will let them stick to their own worlds and only then we will ask them for their explanation of how they are established" (LATOIR, 2012, P. 44).

With the intention of contributing to the knowledge production about the reality in the field of education, we have proposed to listen to the students of a school of the Municipal Network of Education of Florianópolis, considered by us one of the main actors of the contemporary education, because we promote the idea that listening to them allows us to enter into their daily lives, to know, and to be part of their digital world, and that is going to help us to understand and rethink how the learning process is currently carried out.

Our research method was the Case Study, which consists of an investigation on a certain contemporary phenomenon introduced in a given real-life context (YIN, 2001). and our study presents characteristics of a qualitative research that investigates and describes complex situations that have social relevance, based on the combination of various techniques and data collections. In our case, we applied an online questionnaire to twenty-nine students present in the class, to identify eight students with an immersive and omnipresent profile who were part of our focus group.

When the focus group was created, the research problem was clearly stated, and the questions asked in a coherent way. We put together a script, a priori, with fifteen main questions that served to guide and stimulate the discussion. As the script was used in a flexible way, it was possible for us to introduce other questions throughout the conversation.

After the transcription of the students' conversations, after several readings, re-readings and attempts to cut, classify, group ideas, we realized the emergence of some controversies, in the sense proposed in the TAR and our analysis was based in the controversies revealed by the students who participated in the focus group.

For the TAR, describing a controversy is a complex act that goes beyond requiring time and knowledge about what is to be achieved with the observation and the proposed description, "[...] the controversy must be recognized by all. They are situations in which the actors agree in disagreement! [...]" (LEMOS, 2013, p.113) in which everything is connected, in some way, at some point. This was what we identified in the conversations with the students.

The four controversies identified and described below, have as their title, statements revealed by the students themselves, since they, already indicate this complex and often contradictory movement experienced by them. In their associations between humans (teachers, community, colleagues, friends, etc.) and non-humans (digital social networks, websites, applications, messages, platforms, video games, etc.) in the search for learning curricular content, now of carrying out activities requested by teachers, research, or study for evaluations.

## FIRST CONTROVERSY: "STILL RESEARCHING ON THE INTERNET, I ALWAYS ASK THE TEACHER" (JOHN)

The first controversy recognized deals with the fact that the students identified as immersed and omnipresent readers are constantly connected, active in cyberspace, and use that space also for their school study, still "confirming", together with the teachers, the veracity of the information that are obtained through the internet. Therefore, we choose John's phrase as representative to give the title of this controversy.

Cyberspace helps the practice of new ways of teaching and learning. Meanwhile, the networks universe is a space in constant transformation. Guidance in the search for the information found is important for it to be translated into knowledge. In this way, the role of the teacher is relevant, since he can act as a mediator of the process, helping the student choosing the best paths to be traveled to find what he is looking for and learn to discern the information seen.

Access to information is facilitated and schools are no longer the only place to legitimize knowledge (MARTIN-BRABERO, 2011), but that does not mean that access transforms information into knowledge. It is necessary to guide the search and translation (LATOURE, 2016), a translation that is essential for teaching and learning process, since it is the exercise of composing new meanings according to the situations that arise and how they are presented. The translation will only have meaning if they are transformed, if they make us, at least, think about what was translated.

Our intention with the first controversy verification was to highlight the fact that TDs do not replace the teacher's figure, that he can and should assume the role of mediator of the students' prior knowledge and of the scientific and curricular knowledge. Of course, in many moments, digital technologies themselves also assume the role of mediator, as affirmed by the TAR, but the teacher is still part of the process, in the students' perception and conversations, as the most "reliable" mediator. According to the student Dimi "In a given day I see what I need on the internet and in another I ask the teacher if it is correct."

From the students' conversations, we can infer that, somehow, they know that cyberspace, beyond of being a place where the information is free, where there are not many rules for publications, anyone can publish about whatever they like and in the way they want. They understand that cyberspace is also a space for unsteady information, as the student Pedro says: "I don't believe 100% in what it says." These students demonstrated that they have a reflective and investigative attitude to the reality presented in that space, not accepting everything they see and hear as absolute truths. That controversy can thus become an action and attitude to be exploited by the teacher.

## SECOND CONTROVERSY: "WE ARE HARDLY AWARE OF OURSELVES" (DIMI)

The second controversy identified refers to the fact that the school, where the research was carried out, has an acceptable technological and pedagogical structure for the integration of DT in the teaching and learning process. Meanwhile, it was found that the computer room is little used in that teaching and learning processes.

The school, where we carried out the research, currently has twenty computers and table in the SI, five Chromebooks, fifty-three tablets, a digital whiteboard and a projector, devices that are available for teachers and students. Based on this information, we can verify that the school is well equipped in terms of technological resources that, can contribute with the most varied teaching methodologies development.

Meanwhile, during the conversation in the focus group, the students said that they use TD very little in school, especially in relation to the use of IS. According to student "A", "If we use tablets three times during the year it is a lot. I only remember a test we did on them". So, what could be causing this situation? since most students already present new ways of learning.

In the focus group, the students asked, and we were also wondering why not "Bring in the IS and teach them how to use these things, power point, google forms, blogs, videos" (Dimi). Or "Teach us robotics!" (Pedro). Or create an application "Same as the Project we saw at the science fair that created a study application, garbage recycling." Or "Make music, We or the teacher creates music and videos about the contents" (Thumbelina).

Following their way of thinking, we asked them if they did not suggest to their teachers about differentiated ways of learning and for integrating the use of TDs, mainly Smartphones. They all said no, and Pedro explained to us why: "There is a law that prohibits the use of cell phones, there I am afraid to ask the teacher to do that, because it cannot be used in the classroom. That law does not help much."

In fact, there is law n. 14.636 / 2008, that prohibits the use of cell phones in schools in Santa Catarina. She is being checked. On October 23rd, 2017, there was a public hearing, at the Alesc9, to discuss the bill 0198.8 / 2016 that aims to authorize the use of cell phones in schools for educational purposes. This law is still a project, it advanced a lot in the discussions during this public hearing, but for now it has not been approved.

In this research, we realized that students want to act collaboratively with the available TDs, in order to associate and establish connection networks for the teaching and learning process. The student known as Thumbelina asked us "Don't you have the blackboards here? Could they use it right? To show and explain the contents, show videos, images, why not? " More important than knowing which action is developed in the associations that we establish with the actants involved, is knowing how we will develop that action, since all mediating action is endowed with intentions.

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<sup>9</sup> Legislative Congress of the State of Santa Catarina



### THIRD CONTROVERSY: "IT IS DIFFICULT TO REACH THEM AND SUGGEST DIFFERENT THINGS. WHAT IT SEEMS IS, THAT THEY LIKE THE TRADITIONAL WAY OF GIVING CLASSES "(DIMI)"

That third controversy comes up in Dimi's conversation. That says that there are many possibilities for a new pedagogical practice, more compatible with these new subjects that are characterized as immersed and omnipresent readers, despite that, some teachers still tend to use only the voice, the blackboard, and the didactic book, with a traditional view of education.

Perhaps this traditional view of education, which the students refer to, is related to the traditional approach described by the author Maríá das Graças Mizukami. For her, the traditional approach is centered on the teacher, he is the transmitter of knowledge, the student is just a passive information receiver. Classes are basically expository, in which the teacher already brings all the content ready, making improvisation, flexibility, and creativity freedom an impossible thing to do for the student (MIZUKANI, 1986).

When ubiquity appears, the idea of a viewer and a receiver is removed and the dynamics of the human-computer dialogue gains prominence, taking the most collaborative and dynamic learning situations (SANTAELLA, 2013). The students externalized their desire to create, to be more active students in the teaching and learning process, an important principle for the development of a more collaborative and meaningful learning.

Early on, children are getting used to using TDs, the affinity of children with them was established differently from what was established by adults. Thus, it is necessary to recognize that our students, who were born in the Digital Era, have a differentiated position in relation to TD and its functions in their day-to-day life. Their mental abilities and strategies are changing (SERRES, 2015) as they consume this or that digital world every time more and more.

Each student interest is the differential in any learning situation. Regardless of the technology available, the didactic book, or the application on the Smartphone, the student who is motivated to learn will want to learn. And to awaken interest, motivate them to want to learn, we bet on the development of a naturally more collaborative learning, in which the students and teachers' participation in the teaching and learning process occurs through interaction, in which each one knows something and has something to contribute, consolidating a collective action of knowledge construction. In this perspective, Ávila, and Borges (2015, p.111) affirm that:

For this new generation, cyberculture has provided other possibilities, new spaces where children and young people seek each other and gather in communities, seek more knowledge and solutions for their doubts, with the help of others, they are informed about world events, their city, and their rights, in short, a generation that is strengthening a participatory culture.

The school is a hybrid environment, made up by teachers, students, managers, classrooms, laboratories, SI, TD, teams and many other actants. It is in this environment that the community is formed, and the actants associate in such a way that the existing connection makes everyone develop actions and transport translations. Searching for new ways of learning and teaching, integrated into the DTs available at school, enables the student to learn by doing, to become an

author and co-author in the production of culture and knowledge through collaborative creation, dialogue, socialization, knowledge sharing, and thus, transform the teaching-learning process into a collaborative attitude of learning and teaching.

#### **FOURTH CONTROVERSY: “MOST OF THE TIMES HIDING. BUT MOST OF THE TEACHERS DO NOT REALIZE IT” (PEDRO)**

Our fourth controversy relates to the fact that students in class 71 use their mobile devices with or without the teachers consent. Although teachers say that it is forbidden to use these devices, students use them, and most teachers pretend that they do not know what is happening. "I use, even if they don't ask me, and I show what I'm using" (Thumbelina).

The immersed and omnipresent students heard in this research that they were born immersed in the digital world. It is very easy for them to navigate in cyberspace. The teacher needs to demystify the use and seek to use DT as facilitating digital artifacts for the teaching and learning process. The benefit and obstacles that TDs can offer to this process cannot be omitted or denied, and the teacher must appropriate them in a way that enhances it as digital artifacts that promote meaningful and collaborative learning situations, in order not to become just more a teaching model, In this sense, Santaella and Braga (2017, P.419) state that:

[...] He is endowed with an odd cognitive speed to orient himself between us and the multimedia nexus without losing control of his presence and his environment in the physical space in which he is located. This is only possible because what you have there is a type of distributed mind, capable of processing, in parallel and jointly, information of various orders, giving them equal magnitude, both the information that comes from the situation around it, as well as those miniaturized that they are within the reach of the fingers and they are traced with visual cunning, courage and almost infallible, as if the eyes were guessing before seeing [...] (BRAGA; SANTAELLA, 2017. P.421).

Perhaps, instead of prohibiting the use of Smartphones, in the classroom, for example, on the claim that there is a law that does not allow that "there are people who get distracted" (Thumbelina), we will start a pedagogical work to join the reflection on what associations when using mobile devices in the classroom. What we want to reveal with this suggestion is that TD cannot be a single principle, good or bad, since the use of them (and of any other available technology) will impact that this will bring to the teaching and learning process of students. Students will depend on the actions and the partnerships that teachers allow.

Finding ways to take the most meaningful learning go through the intention of integrating the use of DT to the curricular content, organizing a collaborative and interactive approach of learning and teaching. Knowing that listening to the students is one of the ways to identify which learning situations they are exposed to as they develop actions in the cyberspace related to their learning process. Doing so, we transform our controversy into a black box.

## FINAL CONSIDERATIONS

Thinking about teaching and learning is important to ensure the quality of education. Why do I work with Education? Where do I want to go working with Education? What is my role as a teacher? What do I do to prioritize and innovate my teaching practice? What is stopping me from innovating? What are the objectives when planning my classes? Are my plans meaningful and flexibles? What subject am I trying to build? What is the importance of the means I use to achieve this end? Why integrate TD with education? How and why integrate them in a truly innovative way in my classes?

The TDs combined with Education seem not yet to be the reality in many schools and are not consolidated in our educational system. Going from a personal use to a professional use is a challenge for professionals to overcome. It will be that listening to our students would help us to overcome the difficulties of effectively using digital technologies at the service of learning and teaching. In short, these are reflections for future research.

Now, with this research, we highlight two controversies that, for us, constitute our most interesting results. The first controversy goes back to the fact that the investigations carried out by the students, where they discover on their own the alternatives to a better understanding of the curricular contents presented. Researching in Google, clarifying doubts about the contents, they discovered Smartphone applications with curricular contents. With that, we can realize that TDs are important mediating actants in the teaching and learning process of these students.

From that first controversy, arises the second to be highlighted: even they use these digital artifacts, new for their school learning, they continue to have the figure of the teacher, the actant who retains scientific and socially "valid" knowledge. They ask the teacher to confirm the veracity of the information found.

We believe that the validity role of the available information is essential and that it must be assumed by the teacher. Perhaps that is one of the main social functions that the school needs to assume today. Students demonstrated access to all kinds of information, which is facilitated through mobile and omnipresent technologies. We also know - and they are aware - that, in the midst of so much available and accessible information, they can come across to misinformation intentionally or on purpose, the so-called fake news.

Given this fact, it is important for the teacher to understand that students have this access and look for the curricular content on the web, as well as other content, to later enable them to develop a critical reflection on the information acquired, problematizing, and questioning them. Only in this way, will both, the teacher and the students develop critical and selective thinking related to this information and thus build a structured knowledge.

Learning situations occur continuously in our daily lives. TDs are very present in people's daily lives. Incorporating them into educational practice requires that we get out of our comfort zone, but they are used with meaning, they can contribute significantly to the teaching and learning process, precisely by giving more meaning to that process.

The associations that are established between the involved actants can modify the teaching practice, showing that the most important thing is not to enable access to technologies, but to enable participation in the knowledge production through its use.

And finally, we would like to highlight that, during the focus group, the students desire is to be protagonists of their teaching and learning process. They want to create. And they want to use the available TDs. TDs are part of them, they are inherent in the way they react, how they speak, how they have fun and how they study.

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