The role of digital technologies for the innovation of the learning experience in the university classroom

O papel das tecnologias digitais para a inovação da experiência de aprendizagem na sala de aula universitária

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Abstract

The constant transformations observed in society and in the contemporaneous culture do not leave any doubt that the educational sector will have to change radically in the coming years. In this sense, digital technologies configure an important ally for the innovation of the educational space since they provide the development of the new learning experiences and widen the possibilities for change. Considering this context, the current article searched for analyzing and synthesizing the role of the digital technologies in the learning experience shared by students and teachers in the classroom. Therefore, a qualitative and empirical investigation of the case study type was carried out with the objective of developing a diagnosis about the context of a specific environment of classroom as well as about the use of technological resources in this space. As a result, it is possible to point out the need of developing new learning experiences shared by students and teachers in the classroom because the current methods establish a conflict between the way how different generations think, perform and search for knowledge.

Key words: classroom of design, digital technologies, inovation, learning experience.

Resumo

As constantes transformações observadas na sociedade e na cultura contemporânea não deixam dúvidas de que o setor educacional terá que mudar radicalmente nos próximos anos. Nesse sentido, as tecnologias digitais se configuram como um importante aliado para a inovação do espaço educativo uma vez que proporcionam o desenvolvimento de novas experiências de aprendizagem e ampliam as possibilidades de mudança. Considerando esse contexto, o presente artigo procurou analisar e sintetizar o papel das tecnologias digitais na experiência de aprendizagem compartilhada por alunos e professores em sala de aula. Assim, uma pesquisa qualitativa e empírica do tipo estudo de caso foi realizado com o objetivo de desenvolver um diagnóstico sobre o contexto de um ambiente específico de sala de aula, bem como sobre o uso de recursos tecnológicos neste espaço. Como resultado, é possível apontar a necessidade de desenvolvimento de novas experiências de aprendizagem partilhadas por alunos e professores em sala de aula, porque os atuais métodos estabelecem um conflito entre o modo como as diferentes gerações pensam, executam e buscam conhecimento.

Palavras-chave: aula de design, tecnologias digitais, inovação, experiência de aprendizagem.

Introduction

In the last decades of the 20th century, a series of technological and scientific innovations evidenced that a moment of instability was emerging. In consequence, "a technological revolution concentrated in information technologies started remodelling the material basis of society at an accelerated rhythm", by inaugurating new perceptions regarding the relation between time and space (Castells, 1999, p. 39). In Castells' conception (1999), the new system of communication generates a flow space that substitutes the space of places, in the same way as time becomes in-timely.

Bauman (2001) utilizes the term fluid as a metaphor for this new context by observing that, unlikely

the solids, fluids do not keep their shape easily neither attach themselves to space and time. In the author's point of view, fluid translates the acceleration of the changes that characterize the present time while solid symbolizes the rigidity and the inertia that characterizes the industrial age.

Towards this thought, Capra (2006) finds out that contemporaneousness points out a new vision of the world, in opposition to an old paradigm that reflects the conditions of an industrial society. Thus, by analyzing the contributions of the works of Bauman (2001) and Capra (2006), it is possible to state that society experiences a unique and important moment that requires news glances at ancient problems and a new glance at the way how the future of society is being guided.

Concomitantly, it is opportune to point out that, with the new technologies and the scientific development, society and culture have changed significantly. In justification thereof, Lévy (1999) finds out that culture, society and technique are independent entities, i.e., technology is, at the same time, product and producer of society and culture. Therefore, it becomes evident why several sectors of life have been undergoing a transformation from this revolution on, thereby giving reasons to the need of parallel innovations with the aim of responding to the new emerging demands. According to this logic, the educational sector exemplifies this situation well, since the technological revolution has modified the way people live, face the world and learn (Amar, 2008).

However, the educational sector did not follow the technological development and, for this reason, requires a larger contextualization in order to respond to the expectation of the students and society (Netto, 2005; Tapscott, 2010). According to Netto (2005), one cannot ignore the fact that contemporaneous youngsters know computer, internet and mobile phone since the day they are born and develop expectations regarding the learning process that include the new digital technologies. Tapscott (2010) attributes to these youngsters the denomination Internet Generation[1] by pointing out that, different from the previous generations, this generation does not intend to be a spectator but, instead, an agent of experiences that are more and more interactive in an environment that is permanently connected. So, the author sees in the technological evolution a great promise for the transformation of the traditional learning model because if on one hand, this evolution modified society on the other can provide a review of the current teaching models.

Considering this context, and the fact that in order to guide the innovation of the classroom from digital technologies one must at first, identify the teaching practices that already employ these tools (Cudd et al., 2003), the current article has the objective of analyzing and synthetizing the role of the technologies in the learning experience shared by students and teachers in the classroom. Therefore, it is about the preliminary results of the Master Degree Paper in Strategic Design that has the objective of knowing the experiences and perceptions of teachers and students of university level regarding the daily learning experience in the classroom as well as about the role of digital technologies within this context.

Theoretical foundation

Learning in the classroom

Historically, education is guided according to a unique learning model focused on instruction, which can be named unidirectional learning. In this model, the teacher behaves as a specialist, holder and conveyor of information while the student performs as a passive receiver whose main obligation is assimilating the conveyed information. Thus, it has been agreed that it is through repetition, experience and practice that information can be memorized and, further on, transformed into knowledge (Tapscott, 1999). Consequently, activities performed in classrooms tend to reinforce this model from practices that induce the student to memorize pattern and pre-established contents.

For Tapscott (2010), this teaching model has in its essence the same principles of mass production that characterized the industrial age. Thus, the same thing is taught to all of the students the same way. However, this rigid teaching model has shown to be inefficient while the new generations are growing in an interactive digital environment totally different from the environment of the industrial age.

Within this globalized cultural context and of quick access to all types of information, it is practically impossible to centralize knowledge in education institutions or in the image of the teacher because the quantity and diversity of knowledge topics are practically infinite and are in constant multiplication. For Netto (2005, p. 79), education "is in front of new challenges since it is not considered anymore, as it was thirty years ago, the genuine source of information of the students". As a consequence, the students and the teachers of the 21st century are not before stable knowledge anymore, but instead, they are confronted with a "chaotic flowing-knowledge", whose direction is unpredictable and uncontrollable (Lévy, 1999, p. 135).

Furthermore, Lévy (1999) finds out that knowledge itself has acquired a validity date which has become more and more limited. In the perspective of the author, a reality that has the trend of being intensified is that the knowledge acquired by a person becomes obsolete even before the end of his professional career. Thus, quite different from the industrial conception of labor, in the information age, its concept becomes a synonym of learning, conveying knowledge and producing new knowledge. The pattern knowledge and the technique offered by the university education are not enough anymore; the new professional must be prepared to construct his own knowledge.

Within this context, the need of a new approach arises for the teaching process, taking into consideration the new needs and possibilities inaugurated by the breakthroughs of the digital technology. Therefore, it is the task of the educational sector exploiting the new

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[1] The term Internet Generation refers to the generation that nowadays is 14 to 34 years old.

technological tools in a positive way according to a perspective that aims at learning while "a technique is neither good nor bad (it depends on the contexts, uses and points of view), nor neutral (since it is either conditioning or restrictive)" (Lévy, 1999, p. 26).

Christensen (2009, p. 18) considers that learning based on computers allows attenuating one of the main deficiencies of the current teaching model, that is, the standardization of the learning process. According to the author, "learning centered on the student is the escape from time, side, physical and hierarchic cells of standardization" that allows that each student learns according to the mode that better suits his style. Within this model, the teacher´s role is also transformed because they no longer are an information transmitter and become the guider of the process and an architect of contents. However, considering that computers are already present in large number in the classrooms, why until now, their presence has not enabled the transformation of the traditional teaching model?

Such situation is the reflection from the insertion of the new technologies in a context that does not offer the opening for innovation. In the perspective of Tapscott (1999), the current scenery of classrooms is the result of an adaptation process of the technology to the conventional teaching context. Thus, computers have been used only to replace old tools, by evidencing the rigid nature of the educational sector where old paradigms demonstrate resistance to the change.

New technological possibilities in education

By observing the transformations nowadays and the new facilities inaugurated by the digital technologies, there is no doubt that the educational sector will have to change radically in the coming years. Nevertheless, in spite of the new possibilities of distance education, the alternative learning approaches will hardly replace the advantages of education based on experiences in the classroom (Havholm and Stewart, 2001). This way, it is opportune re-thinking the learning model in this space considering the advantages brought by the breakthroughs of the digital technologies (Netto, 2005).

As per Balotsky and Christensen (2004), education in universities must develop a hybrid strategy for the change by combining the advantages of the experience in the traditional classroom with new possibilities inaugurated by the digital technologies. In this sense, many studies introduce contributions able to stimulate and guide a reflection about the different application possibilities of the technological tools in the context of the classroom. For Cudd et al. (2003), the analysis of the current uses of this equipment for education is fundamental for any project that searches for the change of the educational sector practices.

In view of the above, Table 1 shows some literature that approaches the use of technological tools in the teaching-learning process and evidences the advantages of using them in the classroom.

However, in spite of the great potential of tecnology, Amar (2008) points out that the use of digital tools in the classroom requires the permanent analysis of their value for the learning process. These tools must not replace the practical activities or the role performed by the teacher (Amar, 2008; Havholm and Stweart, 2001), quite on the contrary, they must provide new experiences that contemplate different learning styles and enables the joint construction of knowledge.

Table 1. Example of digital tools utilized for the learning process.

| Technological tools/Author	Advantages of using them in the classroom
Videoconference/Amar (2008)	• Virtual communication in real time by means of sounds and images; • Exchange of information and knowledge in an interactive way by people that are geographically distant from each other; • Simultaneous participation of groups.
Weblog/Amar (2008)	• Publication of contents in texts, videos and photos; • Open participation; • Possibility of sharing information like, for example, doubts, personal comments, solution of problems, etc.; • Creation of communities of students and teachers interested in the same subject; • Collaborative work.
Virtual simulation/Lévy (1999)	• Broadening of individual imagination; • Formulation and quick exploitation of great quantity of hypothesis.
Plataform for evaluation/Pellegrino and Quellmalz (2010)	• Immediate feedback; • Integration of knowledge; • Generation of diagnosis.
Educative videos/Thompson (2011)	• Visualizing the content of the video at any time and as often as needed; • It makes possible utilizing the time in the classroom for the development of practical activities and exercises that need the teacher´s follow-up.

Methodology

In order to reach the objectives described previously, the current article has been developed by means of a qualitative empiric investigation of the Case Study type. According to Yin (2001), this is a methodological strategy that does not require the manipulation of relevant behaviors related to the their object of study and for this reason it allows understanding complex social phenomena enabling an investigation capable of preserving the holistic and significant features of the analyzed events. In general, one believes that the selection of this method allowed gathering a series of context information that is relevant for the comprehension of the experience lived by teachers and students in the classroom.

The research was developed in the Design Course – Graduation: Design of *Universidade do Vale do Rio dos Sinos* – Unisinos[2]. The choice of this institution and, more specifically, of one class of students and teachers of the 4th semester of the Design course as a unit of study (Learning Program 4 – LP4) took place by taking into consideration the innovation level provided by the guidelines of the Pedagogical and Political Project of the course which projected its education activities by means of a model that questions the discipline paradigm by evidencing that its institutional environment offers the opening for initiatives that search for changes. Besides, the choice of the referred class is justified by the fact that it is in a stage of formation what allowed it to experience in the classroom different practices and learning approaches as well as observing the uses assigned to technologies in this space.

The development of the Case Study started from the contact with the institution and the graduation course described. Thus, after authorization for the development of the investigation activities in site, the phase of approaching and working on the sensitiveness of the students and teachers of LP4 in order to incentivate their participation over the three procedures of the data collection (Figure 1). The first of them, the documental research, had the objective of presenting a brief description of Unisinos and the Design course. For such purpose, a survey gathered the main institutional documents like the Pedagogical and Political Project – Design Graduation Course and the Plan of Institutional Development.

As to the second procedure, the observation of teachers and students occurred in classrooms of the Design course during 18 periods of curriculum activities that took place from August 1st to September 2nd, 2011. In such places, besides the interaction between students and teachers, one tried to observe the motivations for using the digital technologies as well as the contributions and restrictions of these tools during the development of the activities proposed in the classroom. Thus, in order to guarantee the record of all of the observed details, notes and photos were taken. Table 2 presents some important information about the observed periods.

Finally, the interviews completed the process of data collection and were performed by the researcher with 4 students and 4 teachers of the LP4 aiming at learning their experiences and perceptions about the day-to-day
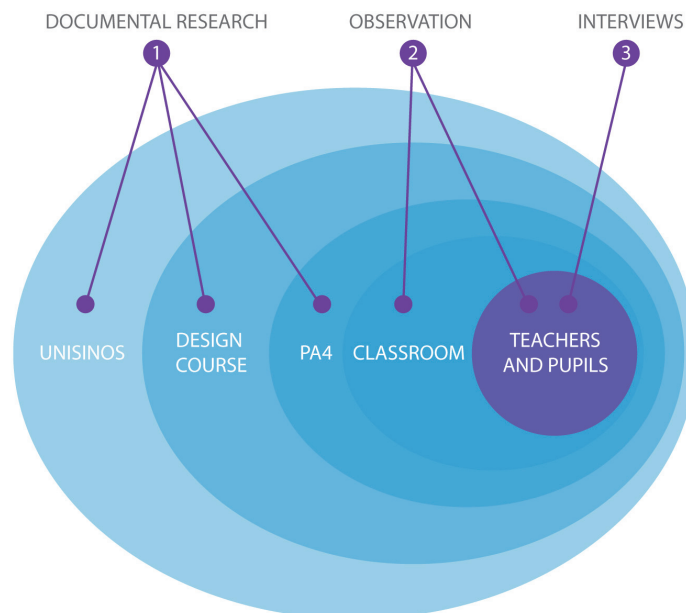
Figure 1. Procedures of the data collection.

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[2] Unisinos is one of the largest private universities of Brazil with around 27 thousand students. According to data of the General Index of Courses published by the Federal Official Journal of November 2011, the University reached degree 4 in the 2010 evaluation, thus evidencing a satisfactory result that distinguishes it from most of the Brazilian institutions.

Table 2. Details of the periods of observation of the classroom.

Observation (O)	Date	Place	No. of students	No. of teachers
O-1*	01.08.11	Porto Alegre	0	10
O-2	15.08.11	Porto Alegre	12	2 and 1 apprentice
O-3	15.08.11	Porto Alegre	14	1
O-4	16.08.11	São Leopoldo	14	1
O-5	17.08.11	São Leopoldo	10	1
O-6	18.08.11	São Leopoldo	10	1
O-7	18.08.11	São Leopoldo	10	1
O-8	18.08.11	São Leopoldo	6	1
O-9	19.08.11	Porto Alegre	12	1
O-10	25.08.11	São Leopoldo	6	1
O-11	29.08.11	São Leopoldo	13	1
O-12	29.08.11	São Leopoldo	12	1 and 1 apprentice
O-13	29.08.11	São Leopoldo	8	1
O-14	30.08.11	São Leopoldo	8	1
O-15	30.08.11	São Leopoldo	10	1
O-16	01.09.11	São Leopoldo	10	1
O-17	02.09.11	Porto Alegre	12	2 and 1 apprentice
O-18	02.09.11	Porto Alegre	13	1

Note: (*) Meetings of teachers.

Table 3. Details of the interviews carried out with the students.

Interview Pupils (IP)	Date	Place	Sex	Age
IP-1	18.08.11	São Leopoldo	Feminine	21
IP-2	19.08.11	Porto Alegre	Masculine	18
IP-3	19.08.11	Porto Alegre	Masculine	22
IP-4	29.08.11	Porto Alegre	Feminine	18

Table 4. Details of the interviews carried out with the teachers.

| Interview Teacher (IT)	Date	Place	Teaching Time	Sex	Age
IT-1	15.08.11	Porto Alegre	7 years	Feminine	32
IT-2	29.08.11	Porto Alegre	20 years	Masculine	52
IT-3	30.08.11	Porto Alegre*	10 years	Masculine	37
IT-4	31.08.11	Porto Alegre	4 years	Masculine	36

Note: (*) Interview via Skype.

learning activity in a classroom. It is worth pointing out that 2 of the interviewed teachers were also coordinators of the course.

In order to guarantee the maximum utilization of the collected information, all of the interviews were audio-recorded and transcribed. Tables 3 and 4 detail the period when the interviews took place as well as the pofile of each of the interwiewees.

The analysis of the collected materials by the Case Study followed the model of Yin (2001) which presents the triangle concept that proposes connecting the collected information as show in Figure 2.

In this sense, Martins (2008) finds out that the trust-worthiness of the Case Study can be assured by cross-ing the sources of evidences and its contribution is even higher when the techniques of data collection are distinct as it occurs in the research in question. In the perspec-tive of the author, the triangle process cooperates for the improvement and convincibility of the investigation dis-coveries, enabling a corroborating style of research.
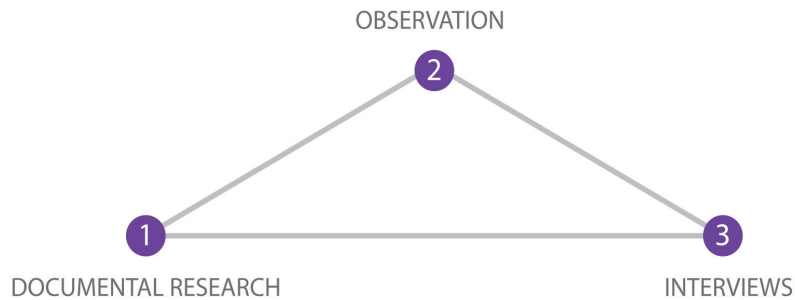
Figure 2. Model of analysis of the collected data.

Presentation and discussion of the results

Context of the study

The class of students and the teachers of Design, the unit of study of this research, integrates the Graduation Course in Design of Unisinos which was developed in 2006 by means of a partnership with POLI.design, Consorzio del Politecnico di Milano (center of research and education in Design from Italy). According to its Pedagogical Political Project (Unisinos, 2006b), the course offers to the regional community a new perspective about design, strongly supported in the concepts of strategic design and innovation.

Nowadays, the course is structured into 6 learning programs, each with duration of a class semester. By means of these programs, one looks for establishing a curricular structure where different knowledge topics can be articulated through the development of projects that meet the demand of an actual client. For such, each LP is based on a Project Atelier, a central space that promotes the pertinent interdisciplinary work for the project activity. In this model, the knowledge topics are presented to the student by the academic activities, that is, activities of conceptual, practical or instrumental education with standard time schedule and which is obligatory to all of the students.

In the perspective of one of the interviewed teachers, this model challenges the logic of the teacher as the sole holder of knowledge since it becomes necessary to plan the classes and contents aligned to the context of the project into development. Thus, it is probable that the teacher faces himself with the challenge of searching for new knowledge topics or approaches that have never been worked out before by discipline models in his field. In the opinion of the interviewee,

"in this process, the students benefit from it very much, the teachers learn a lot because they have to build bridges with knowledge fields that are not theirs necessarily. He obliges himself also to research, to think, to articulate and to construct connections. Then, it moves the teacher from the comfort area. I think this is fantastic" (IT-3).

Thus, based on the LP concept, the course aims at breaking the traditional linearity by means of a model that looks for promoting the constant articulation of theoretical and practical contents as well as among the knowledge fields involved in the professional education. Most of the teachers participating of this research believe in the benefits of the LP model although it has undergone modifications in its structure already foreseen in the Pedagogical Political Project (Unisinos, 2006b) contributing therefore for the adequacy of the proposal to the practical reality of the course.

"As I told you, neither is everything perfect nor is everything coming out perfect, but one corrects little things from one year to the other" (IT-4).

In view of this, it is possible observing an institutional environment favorable to the change since one searches for breaking off with the university teaching model based on independent disciplines independent of the innovation level. As per Borjas (2006), the change in the educational sector will only take place if there is previously an open environment for innovation. For such purpose, the educational management plays a fundamental role in the measure that it makes possible the creation and internalization of innovating initiatives in the routine of the teaching institutions through a process that allows mistakes and successes as worded by the interviewed teacher. In this sense, one observes within the researched scenery that the institutional values reinforce the commitment with innovation the same way that the Institutional Development Plan (Unisinos, 2006a) establishes proposals and initiatives that considers the need of adopting innovating practices to teach in the classroom as well as improvements and constant updating of technological infrastructure.

The Learning Program 4 (LP4), the period when the current research was carried out, occurs in the 4th semester of the curricular activities of the course. In general, the objectives are: "understanding the elements that integrate the system-product as well as their relation with culture, the methods and the pertinent instruments for the development of strategic projects; building a strategy of sense for the existence of the product, by means of understanding the effective possibilities of the design processes applied to material and immaterial products" (Unisinos, 2007).
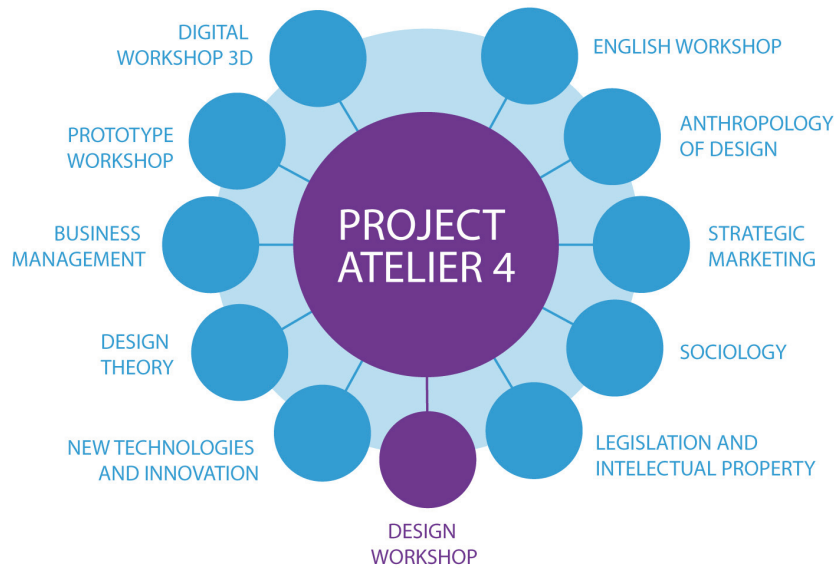
Figure 3. Academic Activities of the Learning Program 4: Project of the System-Product.

For such purpose, the LP4 offers academic activities that aim at developing the needed competences so that the student reaches the objectives determined by the semester. Thus, besides the Project Atelier 4 that centralizes all of the knowledge, the student must attend all of the activities foreseen by the curricular plan as shown in Figure 3.

It is worth pointing out that, in the case of LP4 of the studied class of students and teachers, the client that motivated the project activities developed over the semester was the Bank of Food of Porto Alegre[3]. From thereon, each academic activity searched at relating its contents to the proposed theme, that is, food and childhood.

In the search for integrating the different knowledge topics, one has observed that, in some cases, the teachers have had difficulties to relate the activities proposed in the classroom to the project theme worked by the Project Atelier. This difficulty was even greater in the essentially instrumental activities that looked for working the technical ability of the student. So, the students interviewed were unanimous when affirmed that previous experiences that were experimented in other learning programs (LP1, LP2 e LP3) did not guarantee the proposal of integrating different knowledge topics effectively. According to the words of the students interviewed,

"There was a semester, the LP2 I think, where we did not feel so much connection among the contents. I also think that it depends a lot on the focus of the client, isn't it, on the partnership that we have during the semester with the company. Not always one succeeds into getting a clear connection" (IP-1).

By means of the observations and of the interviews, it was possible identifying some factors that influence this perception of the student. Among them, it is possible mentioning: (a) the general characteristics of the client (sector, supply of information, availability to follow up the project); (b) the objectives of the project in question; (c) the effort and the constant communication among the teachers; (d) the coordination of the academic activities and of the project process developed during the Atelier; and (e) the participation and the effort of the student in the proposed activities.

On thinking about the relation among the social actors of the classroom context and the digital technologies, there are two points to be hightlighted. The first of them concerns the participation and the effort of the students in the proposed activities because one observed frequent delays in the arrival of the students as described below:

"The observed activities started with few students in the classroom so that the teacher expressed his concern about the absences. As the time goes by, the students arrive, some of them, more than 20 minutes late. At this point, the discussions had already started and it is perceived that the teacher wastes considerable time on retaking the content with the students that arrived after the beginning of the class. Even so, it is difficult for the student to follow up the discussions that had already started. Thus, one observes that the delayed students open their computers and access blogs and social networks that are not apparently related to the theme under discussion in the classroom" (O-12).

Within this context, it was possible observing that the routine of students'delays made it difficult for the teacher to plan and develop a learning experience shared by the

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[3] The Bank of Food is formed by a group of companies and non-governmental institutions that manage the collection, reception and distribution of food donations for enrolled assisting entitities (Banco de Alimentos, 2011).

class because when they entered late in the discussion, the pupils lost the first stimuli of the class. So, the digital technology sometimes configured itself as an escape valve for the student and the access to social networks was observed with high frequency.

> *"The class started somewhat confused, although the teacher's effort it was difficult to catch students' attention who were entertained with their personal computers and were bored with the theme of the class. It is observed that most of the students are connected to the facebook and that the access to this social network is frequent during the class" (O-4).*

According to Tapscott (2010), such situation can be the reflection of the incompatibility between the thinking modes of the Internet Generation and their teachers. The author considers that the current teaching models, based on expository classes, are responsible for the boredom observed in many students who are used to interact by electronic means. The interview below reveals that the teachers are aware of that, but they still have difficulties to change this working model.

> *"[...] I was on a meeting Saturday and the teachers brought examples and talked about power point saying that sometimes this tool is boring in a theoretical discipline. So, I am thinking on changing this situation regarding the students" (IT-2).*

The second point implied in the relation among the social actors of the classroom context and the digital technologies is regarding the communication among the teachers in the measure that this is a fundamental factor for the effective integration of the different knowledge topics. In this sense, one observed that in spite of the schedule of 3 presence meetings among the teachers in average per semester, the communication provided by these meetings seemed sometimes not enough in view of the objective proposed by the LP.

This finding results from the observation of the lack of frequent dialogue among the teachers or other means that may render possible the comprehension of all of the activities that have been developed by each academic activity individually, making difficult the whole learning process follow-up. Notwithstanding, when needed, the teachers used digital tools in order to share files and send e-mails by evidencing the technology potential though little exploited for the indispensable communication among the teachers before the curricular proposal.

Considering the above, it is possible to affirm that with the digital technology in the classroom a new teaching-learning experience is introduced to the teacher and to the student. Along with it, new challenges also arise since the use assigned to technology is what is going to define its value for learning within this space.

Digital Technologies in the learning experience in the classroom

Digital technology makes part of the daily life in the contemporaneous society. It is present in most of the houses, offices and classrooms around the world, by establishing new models of interaction and experiences, independent of space and time. The class of students and teachers analyzed by this research is inserted in this context, a fact that allows watching it as a small sample of the current society.

However, as it occurs in society, within the classroom different generations get along and each one experiences the technological evolutions in a completely different way. In his work, Tapscott (2010) established frequent comparisons between what he calls Internet Generation and Baby Boomers Generation. According to the author, while the Baby Boomers underwent a process of adaptation to the digital environment, the Internet Generation was already born and raised plounged within this new context. Consequently, quite different from the previous generations, the youngsters of this generation have a natural affinity with the technology, by utilizing it in an intuitive way in order to communicate, research and learn.

During the periods of observation of the curricular activities of the LP4, the great interest and attachment of the students to the digital technologies became evident; notwithstanding, the first action of most of the students when entering the classroom was taking the portable computer from the bag and turning it on.

> *"Generally, I turn on my computer. The first thing that I do is take the computer and turn it on, log in and browse on the internet until the teacher starts the class. […] If the teacher is talking about something that has a site, some reference, the first thing I do is look for this reference on the internet. If not, I keep on watching novelties and download sites. I keep on browsing on the internet" (IP-3).*

The Internet Generation students have natural affinity with the technology and feel at easy to perform different activities simultaneously (Netto, 2005). For this reason, it was usual observing them accessing social networks and sites during the activities proposed by the teacher in the classroom. According to Tapscott (2010), the fact that these youngsters have been raised in a digital environment, full of stimuli and interactivity, has changed the way how the brain itself is scheduled. In the perspective of the author, this is a sign that this generation has developed new capabilities that are still strange to the former generations what can be perceived in the speech of the teachers like the following example:

> *"There is a problem with the computers, isn't there? Well, I love computers, I am always in front of a computer, but the problem is that the student has difficulties in keeping the focus in the discussion. Well, the computer is a fantastic thing which I adore and that could be great in the classroom…? If the students were focused on it, searching for information about what was under discussion, well, great, isn´t it? But this is not what happens most of the time. Most of the time, the student is browsing: using the msn, e-mailing, and watching tv programmes…and things like this" (IT-2).*

In view of this situation, it is possible to observe different attitudes before the digital technologies in the

classroom: the student´s and the teacher´s. So, if on one hand the student perceives the computer as a tool that is pertinent in the classroom, on the other hand, the teacher believes that the digital technology hinders the concentration of the student in this environment, moving their focus from the proposed activities. In this sense, it is possible to question the (in)correct use of these technological resources by the student. In the perspective of Netto (2005, p. 79), "it is at this point that education gains enormous importance as a process of "educating" the citizen before the new technologies", by guiding them onto a kind of use capable of potentializing his learning by means of access to knowledge topics that are relevant for his life and development. Thus, it is the teacher´s task to drill the positive use of the technological resources in the classroom once the student must leave from the university with inputs in order to understand the potentialities of the electronic instruments in the labor market.

> "For me, the more technology it is available in the classroom, the more it increases its potential as a space of learning and construction of knowledge while it is also important that one observes that both students and teachers need knowing how to exploit this technology, isn't it?" (IT-3).

According to Netto (2005), it is important that the teachers feel themselves enthusiastic and challenged to exploit the potential of technology and internet in education since it provides them with opportunities to learn, together with the students, the best ways of utilizing the technological tools in the learning process in the classroom. Besides, Agbonlahor (2006) highlights that the teachers play a fundamental role in the process of implementing a successful change in the educational sector since the way how the teacher guides the activities in the classroom is what is going to define if the use of the tool makes possible the innovation to take place or if it will only replace the teaching resources usually utilized.

Thus, it is important to point out that, independently of the individual use made by the student, digital technology, in many cases, becomes an ally of the teacher because it was possible observing activities where its utilization favored the teaching-learning process making it more attractive for the student and more dynamic for the teacher.

> "These monotonous things of following up texts, of reading, of talking about the texts are a little monotonous, I think, so that I cannot pay attention. Now, things are more dynamic like showing pictures, videos… then I have questions… then there is a reference on the internet… so it is not the teacher always keeping on talking and teaching like this. When everybody participates, it is more interesting" (IP-3).

> "[…] while the teacher kept on talking introducing the themes of the class, most part of the students kept on accessing social networks. However, in order to start the discussion, the teacher shows a recent video from the You Tube. The students close their personal computers right away and, quite involved with the subject, begin to participate on the class" (O-4).

This observation evidences the importance of an initial stimula that promotes the immersion of the student in the classroom. In this sense, as it occurs in the example of the video, the digital tools seem quite proper. At the same time, the interview demonstrates that the student tries to be an active agent of the learning process. In the perspective of Tapscott (2010), the students of the Internet Generation appreciate the interactivity and the dynamics of the activities in the classroom and this transformation of the student´s profile vis-à-vis the former generations is directly connected to the breakthroughs of the digital technologies and their great influence in the society and in the day-to-day life of the students.

Therefore, according to the same author, it is not surprising that teachers-commmunicators and TV channels are losing their audience because the youngsters do not feel attracted to this unidirectional model of communication anymore. Students that grew up surrounded by interactive digital stimuli do not want be taught. They want to learn and search for knowledge in a joint way.

Before this context, one observes that the presence of digital technology in the classroom and the different ways of thinking lead teachers and students to live distinct experiences in this space. So, while the teacher perceives the classroom as a delimited space where the interaction with the student is mediated by technological tools of unidirectional nature like the power point projection (Figure 4), the student experiences a completely distinct context where he at the same time attends or participates of the class and interacts with friends in social networks, becomes informed about the last novelties in blogs and makes quick researches in the internet. Thus, it is possible saying that, for the student, the notion of space and time of the classroom was transformed considering that the walls are not the actual limits and the teacher is not the sole source of knowledge. For the student, all of the information and knowledge are a "click away" (Figure 5).

In view of this context, the need of developing new learning experiences shared by students and teachers in the classroom becomes evident because the current methods establish a conflict among the ways how different generations think, perform and search for knowledge. So, it is possible observing students that do not identify themselves with the teaching methods utilized by the teachers. Aware of this context, the teachers search for inovating their methods by utilizing the means of the digital technologies. In this search, one observes, however, that in most cases, the technologies only replace old tools that repeat the unidirectional teaching that is incompatible with the expectancies of the students.
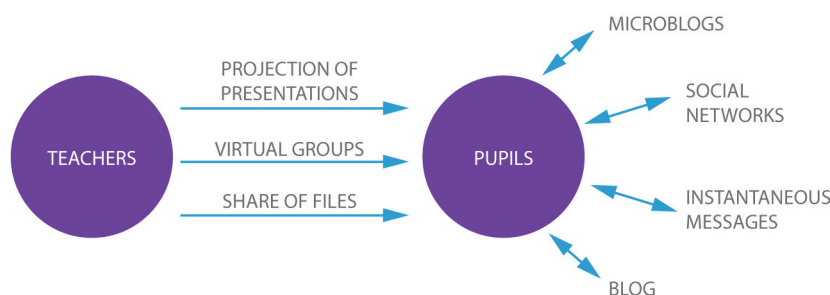
However, in some activities the digital technologies are already pertinent to the classroom while they make possible the effective participation of the student in the search for knowledge, collaborate for the process of the student´s immersion and made the class more dynamic and attractive.

Final considerations

The technological evolution of the last decades and its reflection on the way of thinking of the current generation of students make clear the need of changes in the ed-
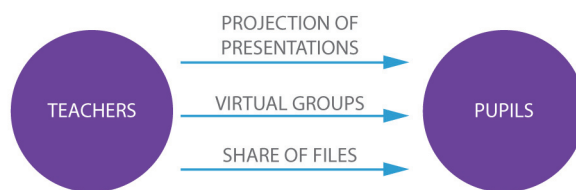
Figure 4. Perspective of the unidirectional interaction of the teacher vis-a-vis the student and the digital technologies in the classroom.

Figure 5. Perspective of the multidirectional interaction of the student vis-a-vis the teacher and the digital technologies in the classroom.

ucational sector since the unidirectional teaching model that has been widely used in the classroom has shown to be little efficient for the learning of the students who are used to live in an interactive and dynamic environment.

In view of the above, the current study understands digital technologies as pertinent means to support the changing process of the learning experience in the classroom, in the measure that one has found out that these resources (a) make possible the effective participation of the student in the search for knowledge; (b) collaborate for the immersion process in the classroom context; (c) are a quick and efficient mean of research; (d) make the class dynamic and attractive; (e) make possible share of information; and, (f) improve the frequency of communication among the teachers.

However, in order that the insertion of the digital technologies in the classroom results in significant changes and not only in the replacement of old tools utilized for teaching, it is necessary that teachers and students exploit together the potential of technology by utilizing it to create a shared learning experience aligned to the frequent social and technological transformations.

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