Skills improvement in self-directed learning using collaborative project-based learning in multimedia communications. Case study at the National University of La Rioja (Argentina)

Mejora de las competencias de autodirección mediante aprendizaje basado en proyectos colaborativos en Comunicación Multimedia. Estudio de caso en la Universidad Nacional de La Rioja (Argentina)

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Abstract:

This article shows the results of research conducted at the National University of La Rioja (Argentina). The object of this investigation was to inquire into the improvement of self-directed learning in students that made use of Project-Based Learning (PBL) strategies during the whole academic year. Students implemented these PBL strategies for the making of a transmedia documentary which was central to their training in a particular subject in the last year of the degree of Communication Studies. The results were obtained through an experiment based on pretest and posttest (no control group used) using a questionnaire for self-directed profile enquiry (CIPA, for its acronym in Spanish) in a group of students of Multimedia Communications at the National University of La Rioja. The experiment demonstrates remarkable improvement regarding the continued use of PBL strategies throughout the whole academic year.

Keywords:

ABPC; Comunicación Transmedia, Aprendizaje autodirigido; Comunicación digital.

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Resumen:

El presente artículo aborda los resultados de una investigación llevada a cabo en la Universidad Nacional de La Rioja (Argentina) donde se indagó sobre las mejoras en el aprendizaje autorregulado de los estudiantes que utilizaron, durante todo el año académico, el método conocido como Aprendizaje Basado en Proyectos Colaborativos (ABPC) para la realización de un documental transmedia como eje central de su proceso formativo en una cátedra universitaria del último año de la licenciatura en Comunicación Social. Los resultados obtenidos son producto de un experimento con pre-test y pos-test (sin grupo de control) utilizando el instrumento conocido como CIPA+ (Cuestionario de Indagación de Perfil Autodirigido) en un grupo de alumnos de comunicación multimedia de la Universidad Nacional de La Rioja, y en el que se aprecian significativas mejoras relacionadas con el método ABCP y su aplicación sostenida durante todo el cursado anual.

Palabras clave:

ABPC; Comunicación Transmedia, Aprendizaje autodirigido; Comunicación digital.

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1. Introduction

Universities' adaptation to the requirements of new professions associated with digital communication demands to improve the quality of learning and teaching processes. Thus, enquiring into self-learning in the university training is indispensable to design and implement processes of teaching innovation which collaborate with the development of interdisciplinary skills in undergraduate students.

This research analyzes the use of an active learning method known as "Project-Based Learning" (PBL) from a transmedia dimension, based on the results of a research carried out in the undergraduate students' training in Communication Studies of the National University of La Rioja (Argentina), in the subject Multimedia Communications, where PBL is applied by means of projects whose final result is a transmedia product.

PBL allows for the integral participation of students, making them protagonists of their own learning, as they develop necessary skills for their future professional practice. As a learning method, PBL is favourable for the digital communication training due to the characteristics of the latter, where the contents, skills and abilities are in the process of continuous changes.

Currently, the expansion of digital technologies has dramatically modified the practice of media production, circulation, and consumption. The different communications environments are marked by hyperconnectivity and continuous changes. This new panorama requires professionals with broad skills in the design and application of strategies of digital

and transmedia communication, with features of non-lineality and interactivity. It is also necessary that they are able to manage multiple screens and languages for users who are protagonists and immersed in the very communicative processes.

Facing this scenario of digital convergence and aiming at training these professionals, project-based learning as a method turns out useful in teaching digital communication due to the characteristics it shows in the teaching process.

The research looks into PBL as a method of teaching and learning, since it allows for a skill-based training. Also, it gives students great satisfaction and improves the possibility of "learning to learn" from the exercise of self-directed learning, alongside the inherent needs and skills of a digital communicator for his or her professional success.

1.1. Self-Learning

We can refer to self-learning as self-regulated learning or self-directed learning. We can also find a set of analogous or similar terms which refer to the same concept, such as self-planning, self-education, self-teaching, autonomous learning, autodidacticism, independent study, and open learning.

As some variants to name the same concept are observed, we may also find different approaches, as those observed by Aceves (2008: 24), who details different approaches as:

> Personality trait (Guglielmino, 1977; Long, 1989, 1990 and 1991; Brockett y Hiemstra, 1991; Candy, 1991; Hiemstra 1988), instructional method (Brockett and Hiemstra, 1991, 1994; Candy, 1991; Cranton, 1994; Pilling-Cormick, 1995), self-administration of education and autodidactisist capacity (Candy, 1991).

Self-directedness of learning is understood to be both a theoretical and practical concept related as such to many other concepts as, for instance, to those by Knowles (1975) and his lifelong learning apprentice model.

> The most recurrent definition in the literature points out that self-directedness of learning is a process in which the individuals take the initiative, with or without others' help, in order to diagnose their learning needs, set their learning goals, identify material and human resources to learn, select and implement the appropriate learning strategies to test the learning results (Aceves, 2008: 24).

Another possibility to be able to define self-regulation is recurring to what is stated by Valle, Rodriguez, Núñez, Cabanach, González and Rosario (2010: 87-88) who claim that it is "an active and constructive process where the subject establishes a set of goals and attempts to plan, supervise, control, and regulate their cognition, motivation, and behaviour, always taking into account the contextual characteristics of their environments."

Likewise, as Pozo and Monereo point out (2002: 11), "If we had to choose a motto, a mantra, which would guide the goals and purposes of the 21st century school, the most accepted one [...] among educators and researchers [...] would certainly be that education should be aimed at helping students learn to learn." In this way, Núñez, Solano, González and Rosario (2006: 140) start to focus on the matter, to advance into one of the main lines of Psychology in current education: learning self-regulation, about which they state that "The construct of self-regulated learning relates to ways of independent and effective academic learning which imply metacognition, intrinsic motivation, and strategic action [...] and is defined as

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an active process in which the students establish the objectives that guide their learning, trying to monitor, regulate, and control their cognition, motivation, and behaviour with the intention of achieving those objectives.

Self-regulated learning tries to explain "how people improve and raise their academic results using a learning method systematically." (Zimmerman, 2001: VIIII) In this light, Gibelli and Chiecher (2011: 4) state that "The fundamental characteristics of students who regulate themselves manifest when they actively participate in their learning process, by monitoring and regulating the learning processes aimed at the results (Pintrich and Schrauben, 1992), by being strategic and staying motivated towards important goals (Blumenfield and Marx, 1997: McCombs and Marzano, 1990)."

Under this consideration, it has been taken the definition by Cázares (2009), who states that self-direction is "a multicomponent concept which is observed by means of the presence of certain level of development of the components of 1) planning, selection, and execution of strategies; 2) use of experience and critical awareness; 3) internal potential; and lastly 4) social and technological interdependence."

Thus, we consider important the description of the 4 components which make up learning self-direction as Cázares states it (2002), and who "translated the components into observable behaviours which can be assessed by the participants in this test, regarding the frequency with which they perceive the occurrence of these behaviours in themselves." (Aceves, 2008: 48).

- **Component 1**: Planning and selection of strategies. It is observed when a person has command of himself or herself; and in this case, it is shown some intelligent acts whose purpose is rationalizing the selection of alternatives for the future thus seeking the best means to achieve them, by specifying ends, objectives, and goals.
- **Component 2:** Self-regulation and motivation. It occurs when the person shows interest for obtaining the ability, the knowledge and the understanding of what surrounds him or her. In that way we can observe a clear interest to excel, and he or she is ready to make an effort to get it. In this case, "he or she uses strategies such as planning and monitoring of cognitive and affective processes, linked to aspects regarding management of time, effort, and information search." (Aceves, 2008: 138).
- **Component 3:** Interdependence and Autonomy. They are items which reveal to a person that he or she has individual will to learn or obtain what he or she is interested in, that he or she admits responsibility for his or her acts (through a critical reflection about them) and has an adequate self-concept." (Cázares, 2002)
- **Component #4:** Use of experience and critical awareness. It is observed by means of behaviours which show the use of cumulative experience in the resolution of problems of everyday life or of any other sort. The person also appreciates others' experience and trusts his or her own. (Cázares, 2002: 139). He or she seeks for a high sense of empathy and social justice.

1.2. Project-Based Learning

Taking an incursion into the method of Project-Based Learning (PBL) leads us quickly to the philosophy and teaching principles of John Dewey's experimental approach (1995) during the first decades of the 20th century. In this sense, we know that, among the main objectives of the learning process, we consider crucial being able to train people who are capable of interpreting phenomena, as well as of analyzing the events happening around them.

> For learning to take place, the student should get ready to identify his or her difficulties and the mistakes he or she makes during this process in order to be able to overcome them. This intentional exercise is called self-regulated learning, which is a self-directed process through which the learners transform their mental abilities into academic ones. (Maldonado Pérez, 2008: 159).

In the same direction, it is crucial for teaching to be able to collaborate with the students in this process; and for that purpose, there are two basic elements bound together: Test strategies and classroom management in collaborative teamwork.

Therefore, and in relation with the actual conceptual definitions from various authors and theoretical aspects, we can assert that "Project-Based Learning is a learning model in which students plan, implement, and assess projects that are applicable in the real world, beyond the classroom." (Blank, 1997; Dickinson, et al, 1998; Harwell, 1997 in Galdeana, 2006: 1). Correspondingly, we can affirm that PBL is "a learning strategy which allows to achieve one or several objectives by means of implementing a set of actions, interactions, and resources." (Ayuste, et al, 1998: s/p) or, as *Northwest Regional Educational Laboratory* claims (2002: s/p), that it is "an integral (holistic) teaching strategy instead of a complement. Project work is an important part of the learning process."

In relation to the teaching and learning processes, it can be highlighted the treatment that Constructivism gives to some categories which prove basic for PBL, where the teacher is the active subject and the facilitator of the learning process in the students, and the student is construed as the active subject in the analysis of the received information. Thus, learning is basically focused on the development of cognitive elements, reasoning, and logical processes such as analysis.

The applied PBL provides a learning experience where the student is actively engaged through the realization of a meaningful and complex project, with which his or her attitudes, abilities, skills, and values are developed and enhanced.

According to Maldonado Pérez, PBL

> Stimulates in students the development of abilities to solve actual situations, with which they motivate to learn. Students become enthusiastic about research, discussion, and they propose and prove their hypotheses, putting their skills into practice in a real situation. In this experience, the student applies the acquired knowledge on a product aimed at satisfying a social need, which reinforces his or her values and commitment to the environment, as well as using modern and innovative resources (2008: 160).

There are many advantages this method offers in the learning process, since it "fosters students to learn and act according to a project design, laying a plan with definite strategies, to provide a solution to a question and not only to achieve curricular objectives (Galdeana, 2006: 3)." It also allows them to learn in diversity by working all together, to stimulate intellectual, emotional, and personal growth "with direct experiences with people and students placed in different contexts."

PBL implies organizing teams made up of students with different profiles, where differences offer great opportunities for learning, and prepare the students in an actual environment that will allow them to work in a changing economy with better adaptation.

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Thus, PBL becomes relevant as an educational strategy for the achievement of significant learnings "because they emerge from relevant activities for students and include, many a time, objectives and contents that go beyond the curricular ones. It allows for the integration of subjects, thus reinforcing the set of human knowledge. It allows to organize activities around a common goal, defined by the students' interests and their acquired involvement. It fosters creativity, individual responsibility, collaborative work, and critical capacity" (Maldonado Pérez, 2008:161).

The main benefits identified by a great number of authors relating to this method, and following the group which Lourdes Galdeana (2006:4) makes, can be summarized as

- Students develop abilities and skills such as collaboration and project planning, communication, decision making, and time management (Blank, 1997).
- Their motivation rises. Attendance increases, there is more participation in class and better aptitude to carry out the tasks (Bottoms & Webb, 1998; Moursund, Bielefeldt, & Underwood, 1997).
- Students develop collaborative abilities to build knowledge. Collaborative learning allows students to share ideas among them, express their own opinions and negotiate solutions—necessary abilities for future job posts (Bryson, 1994; Reyes, 1998).
- Problem solving abilities are increased (Moursund, Bielefeld, & Underwood, 1997).

Likewise, among the remarkable PBL's benefits, it can be said that:

- It increases motivation. Teachers often notice a rise in students' attendance to school, greater participation in class, and better aptitude to carry out tasks.
- By means of the projects, students make use of higher-order mental abilities instead of memorizing data in isolated contexts without any connection to what or where they can be used in the real world.
- It offers opportunities to collaborate to build knowledge. Collaborative learning allows students either to share ideas among them or to serve as an echo chamber of others' ideas; to express their own opinions and negotiate solutions—all necessary abilities for future job posts.
- It increases social and communicative abilities.
- It increases the abilities for problem solving.
- It allows students to make use of their individual learning strengths and of their different approaches towards it.

1.3. Implementation of PBL

In order to carry out a proposal of project-based learning and collaborative work, Cenich and Santos (2006) highlight two core characteristics in the learning process: Problem solving and collaborative work. For the first one, it is necessary good, significant, and truly complex problems which stimulate the exploration and reflection needed for building knowledge. The second characteristic refers to the interaction with others, to working together as peers, by applying their knowledge combined towards the solution of the problem (Tam, 2000). Hence, students engage in a collaborative on-going process of building knowledge in an environment that reflects the context in which the knowledge itself will be built in situ" (Hamada and Scott, 2000: 6).

As *Northwest Regional Educational Laboratory* (2002: n.p.) claims:

> "It is utterly important that everyone involved or interested is clear about the objectives, so that the project is planned and fulfilled effectively." Both the teacher and the student must make a proposal to explain the essential elements of the project and the expectations for it. In addition, the development of the proposal is a key element in the success of the project, which requires that both teachers and students contribute to its design, since "the more engaged the students are on the process, the more they will retain and be responsible for their own learning" (Bottoms & Webb, 1998).

It is therefore utterly important to remark that every participant in SPL must have clear objectives, so that the project can be planned and fulfilled effectively. Both the teacher and the student must make a proposal to explain the essential elements of the project and the expectations for it.

1.4. Advantages and benefits

Among the main advantages identified by Coria (2011: 5) regarding the use of projects in teaching processes, we found that

- It fosters students to think and act according to a project design, to set a plan with well-defined strategies, to give a solution to a question and not just to achieve curricular objectives.
- It allows to learn in diversity by working all together. It stimulates intellectual, emotional, and personal growth with direct experiences with people and students placed in different contexts.
- Students learn different techniques for the solution of problems, by being in contact with people from diverse cultures and with different points of view.
- They learn to learn alongside others, and they also find out the way for their peers to learn.
- They learn to assess their peers' work, to give constructive feedback both for themselves and for their classmates.
- The process of elaborating a project allows and encourages students to experiment, to learn from discovery, to learn from their mistakes, and to overcome difficult and unexpected challenges.

1.5. The Relation between SPL and Digital Communication

The close bond that can be established between Project-Based Learning and the Information and Communication Technologies (ICTs) has been widely remarked by different authors (Northwest Regional Educational Laboratory, 2002; Coria, 2011; Ortiz, Calderón y Travieso, 2016), since ICTs have become a favourable medium for the application of this teaching approach.

As Galdeana (2006) states, SPL allows for a broad learning variety, due to the great amount of knowledge transmitted among students. This is considered to be especially true in a technological environment and in everything related to digital communication, and to the very form of collaborating and contributing in project development.

Accordingly, if collaborative learning favours the acquisition of skills and attitudes which occur as a result of the interaction in group, it is therefore crucial the application of PBL in this framework, since it will collaborate with solving

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complex problems, as well as with accomplishing difficult tasks of a broad variety, such as the necessary ones to produce and manage digital communication. As Galdeana reminds, "students need to get instructions and to perform complex practices so as to work properly in the environment of project-based learning supported by the ICTs. The technological environment should also be specifically designed to help students perform successfully" (2006: 14).

We know that PBL stimulates cognitive, motor, aethical, and affective aspects simultaneously, which allow to work with an active pedagogy. As students have to display their research skills, they not in vain get engaged on the generation of new knowledge—their own.

> "Projects allow to implement collaborative learning, grouping, classroom rearrangement, integration of available resources, a different kind of assessment, genuine interaction among students in the curricular activities by incorporating good teaching experiences which have so far belonged to extracurricular activities. Moreover, it facilitates students to participate in ways of interacting that the current world demands" (Maldonado Pérez, 2008: 169).

The technological environment and the model of PBL represents a unifying concept in education, so the link between PBL and digital and transmedia communication is unavoidable, assuming that "each of its component can be analyzed from the point of view of a given contribution, so that a person or group of people performs successfully" (Galdeana, 2006: 14).

1.6. Application of PBL at the National University of La Rioja in Digital Communication Learning

In 2009, the implementation of a new curriculum for the degree in Communication Studies at the National University of La Rioja (UNLaR, for its acronym in Spanish) in Argentina, meant—besides the incorporation of new subjects into the new curriculum—an adaptation and re-engineering of the training in line with the changes in communication, such as the emergence of digital communication in the development of the undergraduate degree, which was something new compared to other Argentine universities of that time.

With the application of the new curriculum in Communication Studies at the UNLaR, the subject "Multimedia Communications" started to develop during 2012. Within the new profile, it was foreseen the development of digital communication in fourth-year students of the two existing programmes: "Journalism" and "Advertising and Corporate Communication", both part of undergraduate degrees of said university.

As Mora (2004:20) claims, "the need for a new context of higher education demands, beside knowledge, training the students in a wide set of skills that includes expertise, as well as the abilities and attitudes required for a job post,". Hence, "learning to learn" is crucial in the learning process of digital communication, since knowledge is changing and much information becomes obsolete in a short period of time. In this sense,

> It is not surprising to claim that a student has taken in a more active and, at the same time, a more demanding role in each of his or her training stages; and the university cannot and must not be exempted from those changes. The fact that education must accompany those new process which present a new scenario is undeniable. And facing those challenges, university education must open up and incorporate those learning processes mediated by technologies in the traditional fashion of teaching (Bron, 2016: 8).

The student has taken in a much more active and demanding role. He or she not only wants content but also, he or she requires it in a way not far from the possibilities of his or her own daily activity, mediated by a screen-based ecosystem.

Given this reality, "project-based learning offers the opportunity to implement student-centered pedagogical approaches. It is applied in order to engage the topic-based concepts in the community in actual contexts of practice, and the student's professional role" (Maldonado, 2008: 172). In this light, Aguaded remarks this aspect by affirming that "the processes and results of teaching and learning have undergone different modifications due to the use of media and new technologies, leading into the urgent need to adapt the educational system to the new times" (2011:15).

Hence, teachers who are worried about the quality of teaching and learning in university studies cannot but attempt to be part of the changes. This would be achieved in many cases by providing innovative learning methods and by being aware of the reputed benefits that PBL might offer. Opting for Project-Based Learning in subjects which can afford it seems to be an almost natural choice with much theory and practice to support it. As Bron and Bazán (2015) state,

> The subject Multimedia Communications, which was created for the degree of Communication Studies as a result of the modification of the curriculum of said degree in 2012, could not have a traditional teaching proposal (p.6). As a subject within the curriculum, it represented an innovation nationwide in terms of education, since few national universities had incorporated this kind of contents in their curriculum.

The use of this method allows for an integrated approach based on activities that foster reflection –as it has been developed in previous pages– as well as complex thought, cooperation, and decision making. It is about the development of projects originated from authentic and significant problems. The projects are within the context of the profession for which the student is being trained. This places it in a real situation which generates the possibility of stimulating not only the acquisition of a syllabus subject, but also of promoting complex abilities such as those related to the development of digital communication.

Applying PBL was an innovation that implied a great challenge where new teaching ways were experienced. How to teach contents that are changing all the time? What to teach of those contents? What adjustment or a slice of reality should be made in the huge field of digital communication? Those were some the questions which posed the teaching challenge, as well as the triggers that today are central in the design, creation, and development of this university subject.

Teaching contents that change from year to year and considering digital communication out of the traditional communication paradigms was the proposal from the beginning. That is where the paradigm of collaborative culture naturally appeared, alongside the student's openness to build his or her own knowledge and to be an active part of his or her own learning, among the different methodologies which started to be applied.

Bron and Bazán (2015), professors of the chair previously mentioned, likewise affirm that

> The fact of being an innovation, a novelty, implies a great challenge; therefore, the experimentation in new forms of teaching becomes a necessity. That is where the paradigm of collaborative culture naturally appears alongside the student's openness to build his or her own knowledge and to be an active part of their his or her own learning, among the different methodologies mentioned before (6).

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In virtue of the new processes which present a new scenario, university training should not be exempted from accompanying the changes and it should be part of the change. In dealing with new challenges, university education should open up and incorporate teaching processes mediated by technologies into the traditional teaching fashion, innovating in each of its stages.

> Being able to train individuals capable of interpreting and analyzing their surrounding context, making use of their own resources and exploiting the acquired abilities through the teaching process will be one of the main challenges of university education, and one of the core objectives of those educators who want to adapt into the new reality (Bron,2016b: 3).

The emergence of this subject, "Multimedia Communications", in the curriculum of Communication Studies at the UNLaR demanded to carry out an innovative project which included Project-Based Learning (PBL) in the annual development of the subject. At first, it was applied partially in a mixed system of methods, sharing the innovative SPL with traditional lectures and the system of assignments. With the passing of years, the method changed gradually until 2016, when it became a full-year subject wholly based on PBL, making projects such as: www.proyectoscaudillos.com or www.victoriaromero.com.ar .

1.7. The Transmedia Project as Part of the Strategy

The importance of making an annual transmedia project was due to the characteristics of adaptation of the transmedia narrative itself into the PBL teaching project which the chair develops.

As Scolari (2013:23) remarks, it was Henry Jenkins who in 2003 endorsed the concept of transmedia narrative revealing that "we have entered a new era of media convergence which renders inevitable the flow of contents through multiple channels."

Jenkins (2013) states that each medium does what it does best, so "a story might be introduced in a film, expanded through television, novels, and comics, and its world might be explored and lived through game play. Every franchise entry needs to be self-contained enough to enable autonomous consumption. That is, you don't need to have seen the film to enjoy the game or vice-versa" (Scolari, 2013 24). That is why it is constantly stated that a story might be told through multiple media, optimizing and maximizing the features of each medium and its particular possibilities. Thus, transmedia storytelling proposes a common experience which encompasses different media and devices, all of them interweaved by a narrative thread (Scolari, 2014).

Undoubtedly, transmedia storytelling is a very particular narrative form that allows for its expansion through different systems of signification (verbal, iconic, audiovisual, interactive, etc.), and media (cinema, comics, television, videogames, theatre, etc.). It is not about an adaptation from a language to another—the stories that are told in the different media are not the same; instead, they contribute to one another to build a narrative world which includes different media and messages in an expanded story. And it is a phenomenon which, it is trendy but not forever, reveals in its essence features of permanence, since its narrative logics work; they are useful in terms of narrative in a dimension of multi-screen consumption, and are endowed with discursive continuity. "Facing audience fragmentation, transmedia storytelling offers a possible strategy to reconstruct audience niches around a narrative world" (Scolari, 2014: 173).

In the light of this reality of change, of format and narrative adapted to the new culture and countless possibilities that take the recipient from their passive role, transmedia offers a great possibility which also influences education decisively. In this light, "Proyecto Victoria Romero" (a multimedia university students' project) benefited from the transmedia project's advantages applied to the teaching and learning processes where the multiplicity of formats and its strong immersive character played a central role in its development, where three phases of teaching proposed by Jackson (1975) –pre-active, interactive, and post-active– are fulfilled. And a university curriculum is committed to "the concentration of the most varied bulk of academic skills representing the fields of knowledge with a high degree of specialization and proximity regarding the world of work for which they train" (Morandi and Ungaro, 2014: 99).

1.8. The Project Victoria Romero

The objective of the assigned project was the creation, development, implementation, and analysis of a transmedia story collectively composed with educational goals, which re-created the story of the hero Victoria Romero from La Rioja. (www.victoriaromero.com.ar).

The project presented the creation of a narrative nonfiction world made up of different elements and contents which allowed the addressees for their active participation in the various media, where it unfolded the story of the most representative heroes of La Rioja's identity and the struggle for the Federalist Party in Argentina; during 2016, with Facundo Quiroga and "El Chacho" Peñaloza, and in 2017, with Victoria Romero.

With this project, the different educational uses of transmedia practices in teaching-learning processes for the development of skills associated with digital communication and students' participation in their own training have been explored.

> We should bear in mind that any version of knowledge formulated in the educational context is appropriate, provided it offers students an actual opportunity for its acquisition. This depends, among other things, on the possibility of relating the new knowledge with other concepts, ideas or known things; to practise with it, to use it in other cases, etc. Moreover, it should help students comprehend the value of what is needed to be learnt, and to keep vitality in the effort of study. Because content is not only the topics that are developed. It is also the manner in which they are presented, the resorted version, the depth with which they are dealt with, their use in different contexts (Feldman, 2015: 9).

The interest in narrative, combined with the use of new technologies for its developments, as well as the response to new experiences arising from the convergence of the media has generated a significant proliferation of transmedia initiatives.

Taking into account this reality and the characteristics of the project, it was decided to take referents and stories with a strong local and regional identity for the development of a project which, besides the students' motivation, could achieve the adherence of the whole community to get engaged on a story that always elicits empathy with its protagonists.

In conjunction with Jenkins's analyses that approach transmedia storytelling through the investigation of the participating consumers and their contribution to the main story creating contents which expand the narrative world, in this project we inquired into these assumptions. But we also presented the exploration of transmedia storytelling from a pedagogical viewpoint based on the interest in the new digital skills in order to analyze the student's digital immersion and the cognitive, social, and emotional implication, taking into account his or her participation in the development of a transmedia story–

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and putting a special emphasis on the addressees' interests and motivation to approach the story characters and their singularities.

It was also assumed what Morandi and Ungaro (2014) assert when they claim that "the plan or design of training projects is something we do every day within the framework of chair teams (...) and it entails foreseeing what forms concrete educational experiences and practices will assume, which we will share with our students." Consequently, in the teaching design used in the chair, we always took into account students' interests and motivations as one of the central axes for the creation of each annual teaching proposal.

On the other hand, the complexity of this particular project and its exploratory and experimental nature involved an important interdisciplinary work that allowed for the construction of a narrative world especially designed for an educational purpose.

The project design includes three major objectives:

- To design a transmedia storytelling which includes activities able to facilitate knowledge of these historic characters—documentaries, web series, animations, social networks, among others.
- To explore the pedagogical benefits of using transmedia storytelling in a context of mandatory secondary school and in the last grades of primary school—the latter being the addressees of the contents.
- To describe the impacts of transmedia storytelling in the digital immersion of students and the cognitive, social, and emotional implication.
- The realization of the project was broadened with different contents, and each of them demonstrated a changeable experience with different outcomes.

2. Material and Methods

2.1. Objectives and Hypothesis

The initial assumption of the source research stated that students which use new technological tools, platforms, and methodologies in their training process improve their skills and the level of satisfaction in the training that they get.

The research objectives are

- To know the potentialities, value, and purpose of the "Project-Based Learning" method in the acquisition of self-directed skills in students of Communications Studies.
- To measure the effect generated by the didactic strategy PBL in self-directed learning by means of a standardized instrument for measuring this ability.

The research focused on the application of Project-Based Learning methodology, and started with the following question:

> How is the self-directed learning profile of Multimedia Communications students modified as a result of an educational process based on PBL method?

The research central hypothesis states that:

The students taking the subject Multimedia Communications, with the use of PBL method, show favourable changes in their self-directedness of learning.

2.2. Instruments. Self-directed Learning Profile Questionnaire (CIPA+, for its Spanish acronym)

Currently, research on self-directedness of learning is addressed from different perspectives which raise interest in teachers and connect them to the requirements and demands that, as it happens in the case of universities, are made by society. As a part of that is "the possibility of developing lifelong learning through students' ability to self-direct their learning. Being self-direction a multivariable construct, the complexity of the research also increases" (Aceves, 2002: 8).

Due to the need of inquiring about the direction of self-learning in young adults proposed by the methodological design of this research, it emerged the requirement to find a valid and reliable measuring instrument for the task. Hence, for this research we selected Cázares and Aceves' CIPA+ (2008).

For the measurement of self-regulated learning we used the CIPA+ questionnaire and we carried out a quasi-experimental pretest-posttest design in only one group. In the design, we used the scheme O1 X O2, being O1 the initial observation, X the treatment (the PBL intervention), and O2 the second measurement (León & Montero, 1997; González, 2012).

The individuals involved in this research were the students of the last year of the Degree of Communications Studies at the National University of La Rioja (UNLaR) in Argentina, enrolled in the subject Multimedia Communications (mandatory for all the specializations) and who attended regularly throughout 2017.

We worked effectively with 18 fourth-year students from the two existing specializations: "Journalism" and "Advertising and Corporate Communication" of the undergraduate Degree of Communication Studies. On the research, three teachers (tutors) also participated from March 13 to November 18, 2017 at the National University of La Rioja.

This particular questionnaire, designed by researchers at TEC de Monterrey (Cázares and Aceves, 2008), assesses the self-directed profile in students which belong to the knowledge society.

CIPA+ presents 50 items which incorporate the four components (previously described) which make up self-direction:

1. Planning and execution of strategies (14 items)
2. Use of experience and critical awareness (12 items)
3. Inner potential (12 items)
4. Social and technological interdependence (12 items)

In accordance with what was proposed by Cázares and described by Aceves (2008), the amplified instrument is Likert-type scale of 5 points, composed by 50 items and 4 components (already mentioned with their corresponding item distribution) which in validation tests show a "Cronbach's Alpha 0.95 index in the final version of the questionnaire" (Aceves, 2008), as it is used in this research.

Table 1. Distribution of overall scores from CIPA+ questionnaire (Total CIPA+)

Score	Self-directed Profile

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50-68	Optimal
69-76	Very good
77-83	Moderate
84-92	Insufficient
93-250	Low

Source: Aceves (2008)

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By their nature, the results respond to quantitative techniques of collection, treatment, and analysis. This allows to approach the phenomenon with a nomothetic viewpoint, although it presents the limitation of not covering other significant aspects of quantitative nature that are part of the investigation programme which is being carried out in the Chair, such as revealing learning processes in terms of experience and satisfaction.

2.3. Applying the Instrument

The design of this research for the work with CIPA+ is a quasi-experimental one. It is not completely experimental, since the missing criterion in this type of experiments to reach such level is that there exists no way we can ensure the starting equivalence of teams, and there is no randomization, as it is about an already assigned group of students (those enrolled in the subject of 2017).

In the quasi-experiments, the groups are already integrated, so the units of analysis are not assigned randomly.

For the self-regulated learning measurement by means of the CIPA+ questionnaire, a pretest-posttest design was applied in only one group. The design scheme was O1 X O2, being O1 the initial observation made on March 14, 2017, X the treatment (PBL intervention) carried out between March 15 and November 18, 2017; and O2, the second measurement, made on November 19, 2017 –exactly as León and Montero (1997) state–, and with the same characteristics of other similar research, as that of González (2012).

3. Results

By means of the obtained results, we attempted to achieve the objective of measuring self-directedness of learning in the students of Communication Studies who attended the subject Multimedia Communications. As it has been previously described, the self-directed profile questionnaire CIPA+ (pretest and posttest) was administered before and after applying PBL and the case processing was made in order to demonstrate the increase of self-directedness of learning, as shown below:

Table 2. Pretest
Case Processing Summary

		N	%
Cases	Valid	18	100,0
	Excluded[a]	0	,0
	Total	18	100,0

Checklist elimination based on all the variants in the process
Source: Own preparation

Table 3. Item Reliability Pretest

Cronbach's Alpha	N of items
,984	50

Source: Own preparation

Table 4: Posttest
Case Processing Summary

		N	%
Cases	Valid	18	100,0
	Excluded[a]	0	,0
	Total	18	100,0

a. Checklist elimination based on all variants in the process
Source: Own preparation

Table 5: Item Reliability Posttest

Cronbach's Alpha	N of items
,974	50

Source: Own preparation

As shown by the reliability statistics, we observe high reliability in both pre- and posttest.

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Table 6. One sample Kolmogorov-Smirnov Test

		Global PRE	Global POST
N		18	18
Normal parameters [a,b]	Mean	123,11	99,11
Most extreme differences	Std. dev.	45,608	35,592
	Absolute	,287	,201
	Positive	,287	,201
	Negative	-,136	-,185
Kolmogorov-Smirnov Z		1,220	,853
Asymptotic Significance (bilateral)		,102	,461

a. The distribution of contrast is normal
b. Calculated from data
Source: Own preparation

Table 7: One sample Kolmogorov-Smirnov Test

		C1 PRE	C1 Post	C2 PRE	C2 post	C3 PRE	C3 post	C4 PRE	C4 post
N		18	18	18	18	18	18	18	18
Normal parameters[a,b]	Mean	36,06	28,89	31,17	25,44	25,28	21,22	27,61	20,94
	Std. dev.	13,541	11,135	10,761	8,556	11,761	9,169	11,019	8,544
Most extreme differences	Absolute	,227	,178	,284	,216	,253	,201	,189	,176
	Positive	,227	,178	,284	,216	,253	,201	,189	,163
	Negative	-,131	-,124	-,117	-,162	-,169	-,193	-,126	-,176
Kolmogorov-Smirnov Z		,963	,757	1,205	,916	1,075	,852	,801	,748
Asymp. Sig. (bilateral)		,312	,615	,110	,371	,198	,462	,543	,631

a. The distribution of contrast is normal
b. Calculated from data
Source: Own preparation

CIPA+ test shows high reliability in Cronbach's Alpha both in pretest and posttest. For data analysis, we first used the Kolmogorov-Smirnov test, which is a non-parametrical test that allows to determine the goodness of fit of two distribution of probability against each other, and we verified that the variables are consistent with the normal curve. On the other hand, the test was made for the distribution of differences of pretest and posttest in each component, as well as in global CIPA. It is shown that global scores, and each component score, both in pre- and posttest have a normal distribution.

3.1. Sample statistics

Global scoring of self-directed profile in pretest and posttest

Table 8. Related sample statistics

		Mean	N	Standard deviation	Standard error of the mean
Par 1	Self-directed Profile pretest	123,11	18	45,608	10,750
	Self-directed Profile posttest	99,11	18	35,592	8,389

***The lower the score, the higher the level of self-direction. Scores between 93 and 250 are considered low level.**
Source: Own preparation

Students have a level classified in the low category in their profile before and after the application of PBL.

Correlations between total CIPA pre-test and posttest

Table 9. Related sample correlations

		N	Correlation	Sig.
Pair 1	Self-directed Profile pretest and Self-directed Profile posttest	18	,854	,000

Source: Own preparation

Likewise, there is a highly significant evidence that there is correlation between the variables, since $p < 0.05$. Such correlation is very good, being Pearson correlation coefficient = 0.854.

Related differences between global scores of CIPA questionnaire in pretest and posttest.

Table 10. Related sample correlations

		Related differences					t	gl	Sig. (bilateral)
		Mean	Standard deviation	Standard error of the mean	95% Confidence Interval of difference				
					Lower	Higher			
Pair 1	Self-directed Profile pre-test and Self-directed Profile posttest	24,000	23,948	5,645	12,091	35,909	4,252	17	,001

Source: Own preparation

Given the observation of these results with a confidence rate of 95%, we can state that after applying PBL to students, the self-directed profile global score improves, in average, 24 points.

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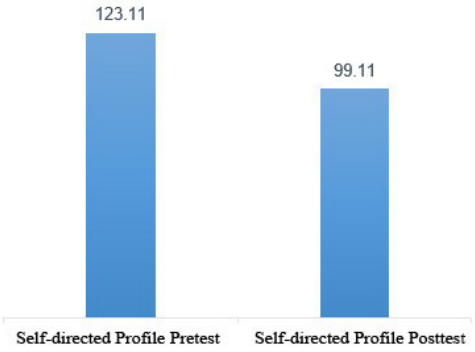
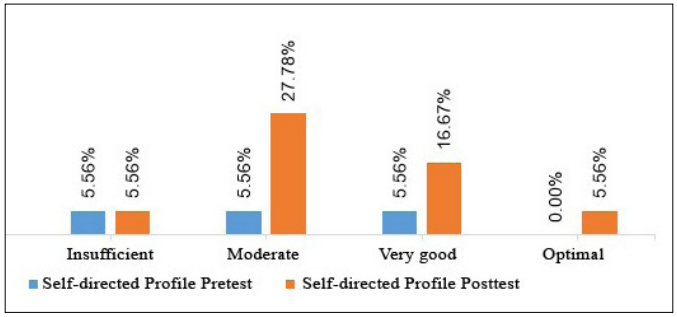
Table 11. Global average score CIPA pretest and postest



Source: Own preparation

Table 12. Distribution of self-directed profiles pretest and posttest



Source: Own preparation

Component 1: Planning and execution of strategies

In this component, we observe a person's self-control, alongside the different acts whose purpose regards being able to rationalize alternatives and their selection in such a way that allows to find the best means to achieve objectives and goals.

Different items associated to time management, meeting goals, as well as representation of doing what is needed to achieve goals in a realistic way, self-discipline, perseverance, among other, are part of the items included as regards planning and execution of strategies.

Table13. Related sample statistics

		Mean	N	Standard deviation	Standard error of the mean
Par 1	C1 pretest	36,06	18	13,541	3,192
	C1 posttest	28,89	18	11,135	2,625

Source: Own preparation

Table 14. Related sample correlations

		N	Correlation	Sig.
Pair 1	C1 pretest and C1 posttest	18	,853	,000

Source: Own preparation

Likewise, according to component 1, we can state that there is highly significant evidence of the correlation between the variables, since $p < 0.05$. Such correlation is very good, being Pearson correlation coefficient = 0.853.

Source: Own preparation

On the other hand, with a confidence ratio of 95%, it can be stated that, after applying PBL in students, the score from planning and execution of strategies improves, in average, 7.17 points, in line with the formulated hypotheses.

Table 16. Responses to Component 1 "Planning and execution of strategies" pretest and posttest

Table 15. Related samples test

		Related differences					t	gl	Sig. (bilateral)
		Mean	Standard deviation	Standard error of the mean	95% Confidence interval of difference				
					Lower	Higher			
Pair 1	C1 pretest - C1 posttest	7,167	7,073	1,667	3,649	10,684	4,299	17	,000

Source: Own preparation

Component 2: Use of experience and critical awareness

When the person shows interest for obtaining the ability, the knowledge and the understanding of what surrounds him or her, we talk about self-regulation and motivation. For this purpose, the instrument inquires about the items which make up this component about alternatives to problem solving, the practice of self-control, the distinction of both appropriate and inappropriate behaviours, as well as the beliefs about success and luck.

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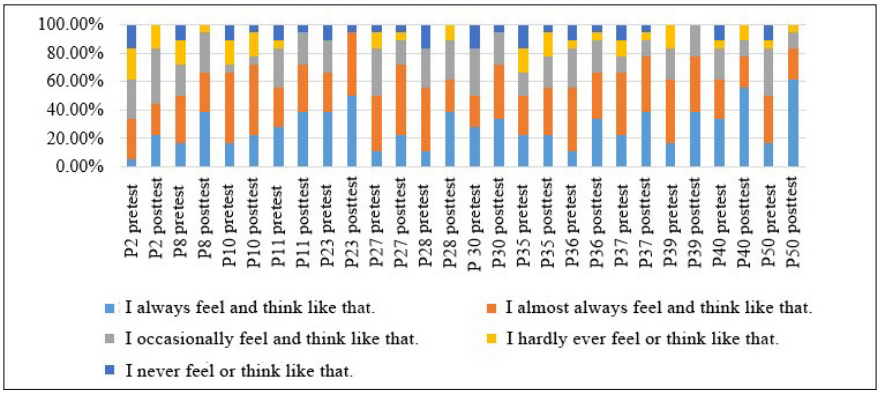
Table 16. Responses to Component 1 "Planning and execution of strategies" pretest and posttest



Source: Own preparation

In the same light, we observe the case of component 2 where there is also highly significant evidence of the correlation between the variables, since $p < 0.05$. Such correlation is very good, being Pearson correlation coefficient = 0.804.

Table 17. Related sample statistics

		Mean	N	Standard deviation	Standard error of the mean
Pair 1	C2 Pretest	31,17	18	10,761	2,536
	C2 Pretest	25,44	18	8,556	2,017

Source: Own preparation

It is also observed that with a confidence ratio of 95%, it can be stated that, after applying PBL in students, the score of use of experience and critical awareness improves, in average, 5.72 points.

Table 18. Related sample correlations

		N	Correlation	Sig.
Pair 1	C2 pretest - C2 posttest	18	,804	,000

Source: Own preparation

In the same light, we observe the case of component 2 where there is also highly significant evidence of the correlation between the variables, since $p < 0.05$. Such correlation is very good, being Pearson correlation coefficient = 0.804.

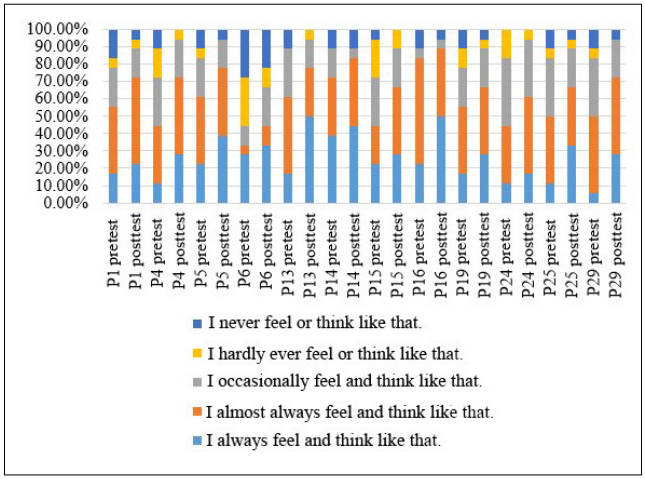
Table 19. Related samples test

		Related differences					t	df	Sig. (bilateral)
		Mean	Standard deviation	Standard error of the mean	95% Confidence interval of difference				
					Lower	Higher			
Pair 1	C2 pretest C2 posttest	5,722	6,406	1,510	2,537	8,908	3,790	17	,001

Source: Own preparation

It is also observed that with a confidence ratio of 95%, it can be stated that, after applying PBL in students, the score of use of experience and critical awareness improves, in average, 5.72 points.

Table 20. Responses to Component 2 "Use of experience and critical awareness" pretest and posttest



Source: Own preparation

Component 3: Inner Potential

'I understand and admit the consequences of the decisions I make'; 'I easily adapt'; 'I have a clear idea of what I want in my life'; 'I can identify my feelings'; 'I admit my personal limitations, rights, and needs'; 'I am realistic and confident of my academic/professional skill' are some of the items which CIPA+ reveals in a person with individual will to learn or achieve what he or she is insterested in, according to the standardized instrument design related to inner potential.

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Table 21. Related sample statistics

		Mean	N	Standard deviation	Standard error of the mean
Pair 1	C3 Pretest	25,28	18	11,761	2,772
	C3 Posttest	21,22	18	9,169	2,161

Source: Own preparation

Table 22. Related sample correlations

		N	Correlation.	Sig.
Pair 1	C3 pretest - C3 posttest	18	.900	.000

Source: Own preparation

As it is with the other components, with component 3 there is also highly significant evidence of an existing relation between the variables, since p < 0,05. Said correlation is very good, being Pearson correlation coefficient = 0.900.

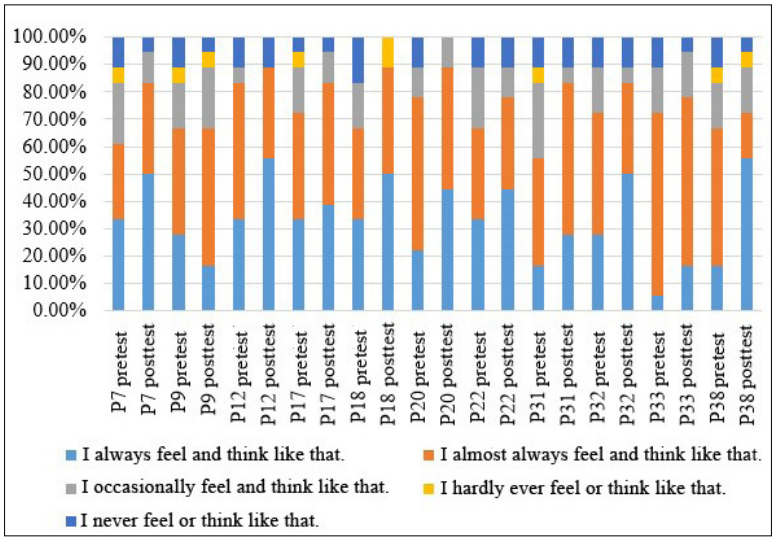
Table 23. Related samples test

		Related differences					t	df	Sig. (bilateral)
		Mean	Standard deviation	Standard error of the mean	95% Confidence interval of difference				
					Lower	Higher			
Pair 1	C3 pretest - C3 posttest	4.056	5.319	1.254	1.411	6.701	3.235	17	.005

Source: Own preparation

Also in this case, with a confidence rate of 95%, we can state that after applying PBL to students, the inner potential score improves, in average, 4.06 points.

Table 24. Responses to Component 3 "Inner Potential" pretest and posttest



Source: Own preparation

Component 4: Social and technological Interdependence

This component is measured by means of indicators related to behaviours which manifest the use cumulative experience in solving problems, both in everyday life as in any other situation. Thus, the instrument inquired into sources and resources for the completion of a task, 'I respect viewpoints different from mine,' patience and respect, use of resources and talents to have both academic and professional success, among other indicators which are part of CIPA+ fourth component.

Table 25. Related sample statistics

		Mean	N	Standard deviation	Standard error of the mean
Pair 1	C4 Pretest	27.61	18	11.019	2.597
	C4 Pretest	20.94	18	8.544	2.014

Source: Own preparation

Table 26. Related sample correlations

		N	Correlation	Sig.
Pair 1	C4 pretest - C4 posttest	18	.800	.000

Source: Own preparation

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In line with the rest of the components, in this case there is also highly significant evidence of the correlation between the variables, since $p < 0.05$. Such correlation is good, being Pearson correlation coefficient = 0.800.

Table 27. Related samples test

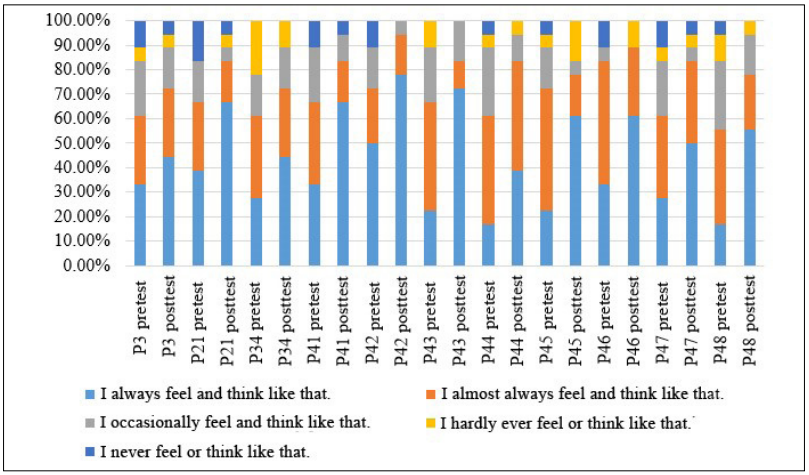
		Related differences					t	df	Sig. (bilateral)
		Mean	Standard deviation	Standard error of the mean	95% Confidence interval of difference				
					Lower	Higher			
Pair 1	C4 pretest- C4 posttest	6.667	6.615	1.559	3.377	9.956	4.275	17	.001

Source: Own preparation

With a confidence ratio of 95%, it can be stated that, after applying PBL to students, the score of Social and technological Interdependence improves, in average, 6.67 points.

So, it can be stated that there are significant differences in the four components between pretest and posttest, proving that the score improves in each one.

Table 28. Responses to Component 4 "Social and technological Interdependence" pretest and posttest



Source: Own preparation

4. Conclusions

As we have detailed before, in order to know the profile of learning self-direction in undergraduate students of Communication Studies at the National University of La Rioja, we used the instrument CIPA+ by Aceves (2008), because it has been proven to be a tried, valid, and reliable instrument.

The choice of this instruments was due to the fact that it is one of the most world-widely use of its kind, besides being in Spanish and designed within the framework of Latin American universities. This instrument, which allows to measure university students' self-directed profile, was boosted by the comparative cases of pre- and posttest regarding the application of PBL during the whole university course.

In the results we obtained, we observed high reliability between pre- and posttest with a normal distribution of contrast and a very high correlation. After applying the PBL method, the global score of self-directed profile improved in an average of 24 points in the global score, as well as in each of the distribution of the instrument four components.

In this light, after having done the research, we can state that students' learning characteristics have improved in the training they received, confirming the initial assumption which held that those students who use these new tools, platforms, and methodologies in their training process, they actually do.

We have also observed how the self-directed learning profile of Multimedia Communications students has improved considerably as a result of a teaching process based on the PBL method.

By implementing Project-Based Learning as a teaching method, undergraduate students have been enabled to improve the planning and execution of strategies, as well as the use of experience, social awareness, and the inner potential.

In the same light, we have been able to prove the central hypothesis, demonstrating that the students who take the subject Multimedia Communications with the use of the PBL method showed favourable changes in their learning self-direction.

Lastly, it is very important to highlight, in general terms, that there exists a significant difference in the improvement of the students' learning self-direction between the pretest and posttest, obtaining results akin to those of other research which have also used CIPA+, such as the one by González (2012) or by Guillamet (2012).

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6. Annex #1 (Aceves, 2008)

CIPA+ QUESTIONNAIRE

Full name: Age: Gender: M - F

Admission Year

	Self-directed Profile Inquiry Questionnaire					
	(CIPA+ for its acronym in Spanish)					
	Instructions: The type of response to this questionnaire is about self-examination and self-understanding					
	Write an X under the number that best expresses your feeling and opinion about the statement					
	1. I always feel and think like that.					
	2. I almost always feel and think like that.					
	3. I occasionally feel and think like that.					
	4. I hardly ever feel or think like that.					
	5. I never feel or think like that.					
No.	**Item**	**1**	**2**	**3**	**4**	**5**
1	I can identify alternative solutions to problems.					
2	I manage my time well. I like having things done before the deadline.					
3	Given a task, I use diverse sources and resources for its realization.					
4	I believe in self-control and I practice it.					
5	I distinguish between appropriate and inappropriate behaviours.					
6	Succes is not a matter of luck.					
7	I understand and admit the consequences of the decisions I make.					
8	I do what I have to do to realistically achieve my goals					
9	I can adapt easily.					
10	I set goals to guide my course.					
11	I have potential to achieve my goals.					
12	I have a clear idea of what I want in my life.					
13	I can distinguish between something important and something not urgent.					
14	I can distinguish between something important and something urgent.					
15	I can identify inaccurate or deceiving expressions.					
16	I can tell when “the group” pushes me to decide on something.					

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17	I can identify my feelings.					
18	I admit my personal limitations, rights, and needs.					
19	I acknowledge I have a wide range of alternatives to achieve my goals.					
20	I admit that I need help and I ask for it when necessary.					
21	I respect viewpoints different from mine.					
22	I know what my strengths and weaknesses are.					
23	I know when I should try harder.					
24	I can determine the reliability of a source.					
25	I can distinguish between real facts and prejudice.					
26	If the maximum results are not achieved with the minimum of resources, the effort is worthless.					
27	I excel at my own merits.					
28	I am self-disciplined.					
29	I am critical and I offer alternatives.					
30	I persevere to achieve my goals. I do not give up easily.					
31	I am realistic and confident of my academic/professional skill.					
32	I am responsible for my actions.					
33	I am a highly motivated person.					
34	I am a patient person and I respect diversity.					
35	I count on strategies that allow me to have academic/professional success.					
36	I have initiative.					
37	I have short and long-term defined goals.					
38	I have a positive attitude towards seeing myself as a valuable human being.					
39	I have a clear idea about the time I have to invest to do something.					
40	A novel situation represents a challenge to overcome.					
41	I use all my resources and talents to have academic/professional success.					
42	I am aware of my responsibility towards society.					
43	I give credits to others for the results of teamwork.					
44	I use dialogue and group conversation to achieve the desired results.					
45	I think my teammates have sufficient skills to complete the work.					
46	I use Internet as a means of learning and communication.					
47	I enjoy people's cultural diversity.					
48	I like trying and researching new technologies.					
49	I can balance the use of Internet as a leisure activity.					
50	I analyze my performance and adjust my strategies if my goals are not being achieved.					
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2. Write the obtained scores for each questionnaire item in the following table. At the end, add each column identified as score. After that, add the total result of the 4 obtained scores:

Total of all Scores _____

According to the following table, identify your degree of self-direction.

Score	Self-directed Profile
50-68	Optimum
69-76	Very good
77-83	Moderate
4-92	Insufficient
93-250	Low

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