



ICT AND EDUCATIONAL INNOVATION: DEMANDS AND EXPECTATIONS*

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ABSTRACT

In the development of the research project “Strengthening and expanding the coverage of postgraduate training in Educational Innovation with ICTs through virtual education strategies relevant to the socio-cultural context of the region”, the meaning of Educational Innovations for teachers was investigated. Through seven focus groups, with the participation of 168 teachers from urban and rural schools, public and private schools, as well as teachers in training, schoolteachers and university professors from 3 different departments in southwestern Colombia, it was identified, through the use of the grounded theory analysis method, that teachers associate educational innovations with changes in the way they teach in their classes. In this way, the incorporation of ICTs is seen as important,

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since it facilitates teaching processes, motivates learning and improves the quality and pertinence of education.

Keywords: technology's uses in education; educational innovation; educational methods; influence of technology.

TICs E INNOVACIÓN EDUCATIVA: DEMANDAS Y EXPECTATIVAS

RESUMEN

El sentido que tiene la innovación educativa a través de la incorporación de las TIC se pierde muchas veces por la falta de re-pensar los procesos educativos para sacar el mejor provecho de estas herramientas. Muchos de los esfuerzos se centran en proveer la tecnología, dejando de lado una capacitación en contexto, para que no se termine simplemente siguiendo las mismas prácticas, cambiando los medios. Es por esto que para cumplir con los objetivos del proyecto de investigación “Fortalecimiento y ampliación de cobertura de la formación posgradual en Innovaciones Educativas con TIC a través de estrategias de educación virtual pertinentes al contexto socio-cultural de la región” se analizó el significado que tienen las Innovaciones Educativas para los docentes. Haciendo uso del método de análisis de la Teoría Fundamentada, se analizó la información recolectada de 168 docentes, tanto de colegios urbanos como rurales, colegios públicos y privados, así como maestros en formación, docentes de colegios y profesores universitarios, de 3 departamentos diferentes en el suroccidente colombiano, deduciendo que los docentes asocian el concepto de Innovación Educativa con los cambios en la forma de dictar sus clases, en donde la incorporación de las TIC juega un papel importante.

Palabras clave: usos de la tecnología en la educación; innovación educativa; métodos educativos; influencia de la tecnología

INTRODUCTION

Today, the main challenge facing education systems worldwide is ensuring that ICT training is able to provide learners with the tools, knowledge and skills that will enable them to learn in context using existing technologies to their advantage and providing tools to create and innovate from their experience and needs. It is well known that we are facing an era in which there is access to “large and growing amounts of information that force us to establish a national, institutional and personal strategy to intelligently, effectively and efficiently process these torrents of information, so that they become enriching knowledge so that people develop their capacities to the maximum, in all activities of individual and collective growth” [1]. Therefore, in order to leverage regional and national development, it is necessary that every citizen develops competencies that help manage information and translate it into knowledge; which will not be achieved if ICT-mediated education is not approached with an innovative vision.

There are many advantages that can be obtained using these technologies, which include:

- Facilitation of learning environments that adapt to new strategies allowing creative and fun cognitive development in traditional areas.
- Development of capacities of understanding and logic promoting in this way the process of significant learning in the students.
- Improvement in the cognitive level of children and teachers by acquiring a new role and knowledge.
- Promotion of creative capacity, creativity, innovation and change.

The introduction of technologies in the classroom has caused the teaching and learning processes to adjust to new methods in order to make an effective use of these new tools. In this scenario, it is necessary to implement advanced training processes in the use of ICTs in the classroom with a level of study that allows teachers and other professionals in these areas to transform their practices in a reflexive manner, in line with the infrastructure available to them and in conformity with national education plans.

At present, there is a tendency to consider Information and Communication Technologies (ICT) as a necessary and sufficient condition for the development of Educational Innovations, and this could be true given that these technologies have been created to increase mental capacity, and with it, the capacity to analyze and

solve different types of problems in a more creative way. ICTs laid the foundation for the transition from an industry-based society to a knowledge-based society [1].

Therefore, as stated by Magdalena Claro [2], “three main school objectives can be identified in the literature in relation to the use of ICT in education: a) to achieve better and/or new learning, b) to generate a pedagogical change or innovation, and c) to produce an organizational change or innovation”. It is on this premise that policies to provide technological equipment, training teachers, and the promotion of their use of ICT in the classroom seek to transform and not only to improve educational processes.

But it is common to find educational proposals that associate the mere existence of technological artifacts or the use of little-known or novel technologies as automatic generators of educational innovations without recognizing that “publishing documents, animations and interactive videos for students, and making online evaluations of the information contained are activities that represent the same pedagogical model that privileges the transmission of information, assuming knowledge as a truth revealed by the teacher” [3]. In this sense, it is necessary to recognize that educational innovation is not only in the use of technology itself, but in the way teachers use it to transform their own pedagogical practices.

Michael Huberman “notes the general framework of innovation and educational innovation, because in general an act is innovator only if it adds something to the sum of known inventions otherwise it would only be a copy of the original act. However, in education, although the invention of new methods, tools, contents and instruments is important, what becomes more relevant is their use, appropriation, use and dissemination throughout the school system. Therefore, when we talk about Educational Innovations with ICT, the question we must ask is: What is it possible to think and do today with ICT, which before was almost impossible or difficult to think about or to do?” [4].

Identifying the available technologies in the socio-cultural context of the educational actors, as well as their possibilities and limitations, and recognizing the explicit or implicit epistemological, theoretical and methodological principles that guide their pedagogical practices, is the starting point that is considered necessary to generate an advanced training space in Educational Innovations with pertinence and quality.

The arrival of Information and Communication Technologies (ICT) has challenged us to think about alternative teaching and learning methods if we want to use these tools more effectively in educational processes. An example of this can be found in the work of Seymour Papert, who proposed the use of the computer as an ideas processor [5-6] generating the educational approach called Constructionism. Another example is the

work of George Siemens and Stephen Downes, who state that in today's world, what's important is not to memorize information, nor to develop skills for the hypothetical future, but to establish connections, with the help of ICTs, with people and sources of information that allow problems to be solved when they appear [7], an approach they call Connectivism.

These potential transformations of educational processes due to ICT, is what has motivated the different countries of the world to invest in computers and tablets, internet access and teacher training in the education sector, seeking the conditions to move from an industrial society to a knowledge society. In Latin America, some of these governments' initiatives have been: the National Educational Informatics Program of Costa Rica that began in 1988; the Enlaces Program of Chile that began in 1996; the Compartel and Computers to Educate Programs that began in Colombia in 2000; the Ceibal Plan in Uruguay that began in 2007; the Canaima Educativo project of Venezuela that began in 2009; the Conectar Igualdad program in Argentina that began in 2010, among others [8]. Although the efforts made by the Colombian State are significant for ICTs to have a great impact on improving quality, pertinence and educational coverage, the fact is that the evaluation of policies and programs in this area present contradictory results [5,9].

In this context, the two hypotheses that guide the development of the research project "Strengthening and broadening the coverage of postgraduate training in Educational Innovations with ICT through virtual education strategies relevant to the socio-cultural context of the region" are presented:

1. In order that teachers and other educational actors take advantage of existing technologies, qualifications obtained through short courses are not enough; instead, formation processes that imply commitment and demand are required and those are conditions that are normally achieved in postgraduate studies.
2. A virtual postgraduate program in ICT for Educational Innovations should incorporate in itself innovative educational experiences with the use of these technologies, but also, in order to seek relevance, it should be articulated with the social, economic, cultural and technological conditions of the context where students develop their educational projects.

Typically, the design and development of formal education programs has been based on the ideas raised by Franklin Bobbit in 1918: to define the sequence of topics or learning experiences considering the gradual increase in complexity, time and resources available in the institution, for the achievement of educational objectives [10].

However, diverse investigations have shown that this form of educational planning can be efficient, but it does not necessarily allow the articulations of different actors of the educational community to be constructed. Therefore, in order to move in a different direction, it is necessary to count on the participation of different actors, such as academics, the government and the business sector, in a collaborative work perspective to approach pedagogical, curricular and didactic aspects from a socially and culturally broad perspective [11].

1. METHODOLOGY

It was of great importance for the development of the project that the design of the postgraduate program in ICT for educational innovation was carried out in a participatory manner, including government, business and academic visions. This interest guided the team in the search for a methodology that would facilitate the participation of the actors involved in the process and that would respond to the interests of the project in a flexible and simple manner. The purpose of this was to ensure that the final result of the design process was conducive to the development of social enterprises and innovations using ICTs in different educational contexts. That is why it was considered necessary to carry out the study from the perspective of Participatory Action Research (PRA) in such a way that what is sought as a result begins to occur from the research process itself [11]. As mentioned by Kemmis and McTaggart [12], PRA differs from other conventional research methodologies in that both the study and the analysis are carried out jointly and the research is oriented towards collective action.

Accordingly, the University of Cauca, the Municipal Education Secretariat of Popayán (SEM), the Departmental Education Secretariat of Cauca (SED) and the Corporation for Incubation and Promotion of Technology-Based Enterprises (Cluster CreaTIC) made an alliance so that the design and development of the postgraduate program considered the interaction of actors and institutions beyond the academy.

The IAP proposes a model of reflection and spiral action determined by the participants [11, 13]; the adaptation of this methodology resulted in the planning of the following phases:

1. Identification of collective needs and opportunities on the use of ICTs to promote educational innovations.
2. Elaboration and feedback of a document with the definition of the axes of formation of the postgraduate program, in consensus with the allies of the project.

3. Pilot assembly of virtual courses with methodologies that tend to articulate with the environment.

In the search for more pertinent educational processes, the question arises about the role of educational institutions and academic programs in the economic, social and cultural development of people, even more so when their fields of action are regions that have a high level of unsatisfied basic needs.

In this context, the concepts of social entrepreneurship and social innovation have been gaining relevance, albeit they are not new. Since these ideas were developed in the work of Schumpeter in the 1930s and in Drucker's in the 1950s [14], in the last decade it has had a new impulse due to the evident consequences of development models, where it seems that the only important thing is the economic profitability for the companies; that's according to the approach made by Friedman in the 70's and also pointed out by Weber in the early twentieth century [15].

Although the concept of innovation is used to indicate the improvement of a process or service, when we speak of social innovation, the emphasis relies on creating innovative and efficient solutions to social problems while generating economic benefits [16]. However, these solutions themselves would not have a greater impact if they are not generated within the framework of organizational structures that make these solutions viable and sustainable, which gives rise to social enterprises. Therefore, a social enterprise is a type of organization, not necessarily a company, formed to provide a sustainable solution (exploitation of a business opportunity and creation of value) to a social problem, which implies changing the ways people think and relate.

Promoting the development of social enterprises and innovations from postgraduate training, seeks not only to bring students closer to the social or cultural realities of the near context, but to consider students as social actors with the ability to influence that context and develop more participatory educational processes where they work on the construction and application of knowledge. Therefore, the approach of social undertakings and innovations as part of classroom practices generates changes in pedagogical models in favor of achieving educational processes of more relevance and quality.

This text presents the conclusions resulting from the investigation of the meanings of ICT Educational Innovations for teachers in the region. This investigation was carried out through focus groups and the information collected was analyzed by people from the allied institutions of the project. The focus groups were the following:

- 32 students and 5 teachers of the Complementary Training Program of a Superior Normal School of Cauca.
- 30 teachers from rural educational institutions in the department of Nariño.
- 12 teachers in the area of Technology and Information Technology in public educational institutions in the municipality of Popayán (Cauca).
- 19 teachers from a public educational institution in the municipality of El Tambo (Cauca).
- 26 teachers and students of an engineering faculty in the city of Popayán (Cauca).
- 26 teachers from a private school in the city of Santiago de Cali (Valle del Cauca).
- 23 teachers from public educational institutions in the department of Cauca.

Through these focus groups, 168 teachers from urban and rural schools, public and private schools, as well as training teachers, schoolteachers and university professors from 3 different departments in the south-west of Colombia participated.

2. RESULTS

The answers given by the participants in the focus groups were gathered in a document of 30 pages, with more than 30,000 words and it constituted a first stage of processing from the perspective of Grounded Theory, for its codification and the definition of categories [17-18]. In this first stage of processing, more than 300 codes were identified and were grouped into 52 categories.

In a second stage of processing, the 32 most significant categories were selected and grouped and the relationships between them were sought. The result was a conceptual map (figure 1) and the identification of the central category: “Educational Innovation changes the way in which the teacher imparts his class”.

With this data processing, the next step was to carry out the analysis with representatives of the different allied entities of the project.

3. ANALYSIS

For the teachers who participated in the focus groups, the educational innovations were processes developed to change the way they teach their class (central category) and those changes were aimed at making teaching processes easier, motivating student learning, improving the quality of education and making education more modern and relevant.

To encourage these changes in the classroom requires assuming a pedagogical position in which the teacher no longer transmits information to his or her students but rather generates processes of knowledge construction from the classroom; to do so, it requires taking into consideration the interests, tastes and needs of the students, adapting educational processes to the context, and incorporating Information and Communication Technologies (ICT).

The incorporation of ICT into the educational process is one of the most important components of Educational Innovations since these technologies facilitate access to information and are carried out through different means and forms. Additionally, due to ICT, student learning is not only facilitated but also improved and made more enjoyable, which motivates students. But ICTs also help teachers, not only students, by facilitating teaching processes and making the academic-administrative process more efficient, which leads to a change in methodologies.

In order for the inclusion of ICTs in educational processes to be effective, the most important thing is to have into consideration the interest and attitude of the teacher. When teachers want to incorporate ICTs, they find a way to take advantage of the technologies available to them in educational institutions and in the social environment, but if this interest does not exist, the efforts will never be enough.

The incorporation of ICT also requires qualification, both in ICT knowledge and in methodologies to promote innovations and in the pedagogical and didactic fundamentals to make these changes in the classroom.

It is also important to have equipment, connectivity and interactive and audiovisual content. In some educational institutions, the number of computers is low or only used by one area of knowledge. If new technologies are to generate changes in education, these technologies must be access-free to all teachers and areas of knowledge and adaptable to the realities of the socio-cultural context.

Since new technologies represent a challenge for most teachers, it is important to provide educational institutions and government entities with spaces and staff to

accompany them. Accompaniment, not only training, is the right mechanism to put into practice the theoretical proposals on the ICTs benefits in educational processes.

4. CONCLUSIONS

With the development of this first phase of the research project, it became evident that teachers associate Educational Innovations with changes in the way classes are taught and in this process the incorporation of ICT plays an important role because it facilitates teaching processes, motivates learning and improves the quality and relevance of education.

The main contribution to the advanced training processes currently offered by this proposal for a postgraduate program lies in the fact that it was conceived based on the dialogue between government entities such as Popayán's Municipal Secretariat of Education and the Cauca's Secretariat of Education with the business sector and teachers of basic and secondary education and higher education. This work has been carried out following the need to create a postgraduate program that responds to the interests of these sectors in order to empower the graduates with methodologies and tools that allow them to impact the reality of our region in a constructive way.

In order to continue the research process in regard to the phase of identifying the needs and opportunities on the use of ICTs to promote educational innovations, there's a proposal of two more activities: systematizing the Horizon reports from 2004 to 2018 and conducting a study of the curricula of specialization and master's programs in the country that address issues related to educational innovations with ICTs.

On the one hand, the Horizon project reports offer a prospective view of the impact that new technologies will have on education in the short, medium and long term. The preliminary analysis of these reports shows that the key technologies revolve around e-Learning, Mobile Learning, Gamification, Virtual Reality, Augmented Reality, Learning Analytics, Open Educational Resources, User-created Content, Virtual Collaboration and Design Thinking.

On the other hand, the initial review of 18 curricula of postgraduate programs in Colombia showed that although there is diversity in courses and program credits, there is some agreement on the importance of addressing the pedagogical and didactic changes generated by new technologies, the development accompanied by educational projects or experiences with ICT, the approach of learning management platforms and digital production and educational resources.

With these elements, the aim is to create a space for postgraduate training that not only responds to the demands and expectations of educational actors in the region but that is also in line with future technological trends in education.

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