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# Educational innovation as one of the drivers of human evolution

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**Abstract**

Educational innovation is presented as a dynamic within the school that enables development, transcending and breaking paradigms in pedagogical practices and in the types of relationships that converge within it, aspects that shape and materialize the evolution of human development. To understand how educational innovation becomes one of the engines of human evolution, this study was carried out under a qualitative methodology, which allowed the analysis of a social phenomenon, in order to interpret the object of study, its constructions, relationships, and synergies From the results, it can be concluded that the challenge faced by the school is to embrace and incorporate the innovation trends that mark the current society, which will allow the gap between the vertiginous change that impacts it and its educational function to be closed.

Key words: innovation, educational innovation, 21st century education, school, 21st century skills.

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## 1. Introduction

The human being of the 21st century is faced with countless situations that alter its existence: uncertainty, change, globalization, information, technological advancements, social problems, among other experiences that determine life in contemporaneity. And in these eventualities, the school continues with its role of educating open minded men and women, who show social conscience and who are creative, innovative, and critical thinkers capable of responding, beyond scientific knowledge as such, to the situations that the global dynamics brings about.

The concept of educational innovation, a category of the first order in this study, is defined as:

> a practice that brings with it alterations, modifications, ruptures, conceptions, and new actions inherent to the educational act that impact the culture of the school – from both the pedagogical and the relational aspects. Dialogues and institutional dynamics are transformed, because new relations give way to a collective construction in which teachers and students reflect, exchange ideas and points of view, which creates a learning community that will be empowered to educate human beings with the personal skills and conceptual tools necessary to develop in a globalized world (Guzmán, 2021, p. 59).

This term is deeply related to the actions of the pedagogical work in relation to the things that happen in the school: the scope and sequence, the students, the learning process, and the school culture that is conceived; aspects that, in addition, are permeated by the global dynamics, in which complex, and urgent problems are faced: climate change, food shortages, pandemics, and wars, among other ills that afflict humanity:

> Educational institutions have a dual responsibility, not only to create the right conditions that would feed a full line of much-needed innovation leaders, but also to transform their own institutions to be more innovative in their organizational structure and culture (Banerjee & Ceri, 2016, p. 4).

Innovation, a concept that is not rooted in education but in the world of production and industrialization, finds its genesis in the second half of the 18th century; moment characterized by the change in the way goods and services were produced. This journey reaches a fourth stage in the 21st century, in which we talk about digital devices and systems; development referred to as the internet of things. All these transformations have brought progress and a new way of communicating and relating with others. Here education is permeated by this dynamic as school is one of the places where human beings develop their social skills. In the educational process, tools are incorporated that do not have their core in the pedagogical discourse and therefore in its practices, but that are borrowed from other fields. An example of this is ICT (Information and Communication Technologies) that adapts and begins to be part of pedagogical practices; Suárez and Custodio state it this way:

> Education, as a relevant aspect in the life of human beings has combined with ICT a new learning environment where students are able to become the protagonists of their own learning, where time and flexibility are playing an important role in an education that has become increasingly virtualized, where the virtual has become a revolution and where new technologies converge to give rise to new educational and pedagogical paradigms. Education is part of technology and

e-literacy is increasingly required, being considered an indispensable competence for the student (Suárez & Custodio, 2014, p. 212).

However, from this perspective we can then think of educational innovation as a horizon of transformation, where teachers are called to create spaces of mobilization and become companions of students learning, with the necessary tools to enhance their life skills, which allow them to learn in context and solve the challenges presented by society. From this point on, the central question that needs to be addressed in a deeper reflection would be: Is educational innovation one of the drivers of human evolution? Is it possible that, thanks to educational innovation, a transformed and transformative social subject can be conceived? This article is born from the process of the research internship of the Doctorate in Education within the Urban Communication Research group of the Universidad Pontificia Bolivariana, where a research exercise on the different social aspects of innovation, including the educational one, is currently underway based on the relationship between communication and education in the context of Knowledge Societies.

### 1.1 Theoretical Framework

***Innovation***

It is unquestionable that the history of humankind has been marked by invention. Man has deployed ideas that can now be classified as innovations because they have allowed him to survive throughout time and improve his quality of life. At first, trying to satisfy his basic needs and then, in response to more transcendental problems of evolution. Examples of this are inventions such as the wheel, the electric light bulb, the car, penicillin, and the internet. Making a historical review of the word innovation, it was found that in the mid-1800s innovation theories appear in sociology with authors such as Gabriel Tarde, mentioned by Jaillier (2017), “where the concept of innovation is equated with that of social change (in grammar, language, religion, law, constitution, economic regime, industry and the arts) (p. 18)". Later, in the early 1900s, innovation would be linked to disciplines such as administration and technology (Godin, 2015; Jaillier et al, 2017).

After the 1960s, the golden age of innovation arose with authors such as Peter Drucker, considered the greatest philosopher in business management, who defined innovation as (quoted in Garzón & Ibarra, 2013) "the provision of more and better goods and services" (p. 49). Another definition of innovation given by Muñoz-Seca (2003), "is how new ideas are put into practice" (p. 239).

Other authors mentioned by Jaillier et al. (2017, p.19) also belong to this period:

- S. Gee (1981): "(...) Process by which, from an idea, invention or recognition of a need, a USEFUL product, technique or service is developed".
- Piatier (1981): "Innovation is an idea transformed into something sold or used".
- COTEC (1988): "Innovation is the complex process that brings ideas to the market in the form of new or improved products or services".
- Parra (2002): "To innovate is to want to create value systematically".
- Pavón and Goodman (1987): "Set of activities, at a time and place, that lead to the successful introduction into the market, for the first time, of an idea in the form of new or better products, services or management and organization techniques"

More literature related to the concept of innovation appears towards the end of the 20th century and in the early 21st century. The Organization for Economic Cooperation and Development (OECD) in accordance with the different European states develop,

> two manuals that aim to regulate R&D activities: the *Frascati Manual* and the first edition of the Oslo *Manual* (1992). The latter text reaches agreements on the definition of innovation: it recognizes product and process innovation, or technological innovation and proposes a system of innovation indicators. This manual becomes an international canon and the main recognition factor for innovation linked to scientific and technological processes (Jaillier et al., 2017, p. 20).

In this regard, Martínez (quoted in Garzón & Ibarra, 2013), states that: "innovating contemplates introducing new combinations between factors of production to generate a better, new or different product, which positively impacts the market and the environment, and brings both economic and social benefits" (p. 49).

> These definitions show that innovation brings a change, an adjustment in the process, a different way of doing things, that impacts the context: the economic, the political, or the educational, among others. The advances occurred in the late 20th and early 21st centuries, in which innovation and technology are protagonists of this vertiginous dynamism in today's knowledge societies, information is interpreted and managed thanks to information and communication technologies, banners of this century. From there it is as if the internet catapults and produces more technological and social advances.

There is no doubt that the presence of social networks also leverages the term globalization. "In this context, ICTs are being leveraged not only to share ideas, but also to generate new interpretations" (Cobo & Moravec, 2011, p. 51).

For these authors as technology advances, society also does, to a point where humanity will have a period of social transformation, in which education plays a fundamental role in becoming an engine of transformation; this implies that schools must focus their pedagogical process on developing the skills that allow them to create, build and participate in open and productive dialogue with others. Here interconnection and globalization distribute knowledge horizontally with the creation of new relationships that are intercepted by innovation:

> Technological change promotes social change. In fact, the technological progress of the near future is expected to trigger periods of social transformation capable of challenging today's imagination. Accelerated social and technological change has a huge impact on education. Therefore, the current leaders of the future of our young people must prepare them for a future that transcends our imagination. Constant globalization is allowing knowledge to be distributed horizontally in areas that until now remained, creating heterarchical relationships and providing the possibility for knowledge to be applied in innovative contexts. In the field of learning, this means that we all become co-learners and co-educators, because of the construction and collective application of new knowledge (Cobo & Moravec, 2011, p. 54).

Thus, innovation seeks spaces of convergence in which the common denominator is the development of communities in the search for equity, equality, and sustainability and, therefore, fairer societies; then, how does this concept permeate schools? Is educational innovation one of the engines of human evolution? Is it possible that, thanks to educational innovation, a transformed and

transformative social subject with its own realities can be conceived? Let's explore the possible answers, Delving Into The Concept Of Educational Innovation.

**Educational Innovation**

Given the well-known social reality in which great inequality stands out, human development and opportunities that are achievable by a very low percentage of the population worldwide, the educational systems are challenged to build, from critical perspectives, different alternatives so that human beings find in the contents of their academic subjects ways of thinking about a world that reveals diverse horizons in which they must develop and be prepared to make decisions, to create the world they inhabit. This is also what educational innovation is all about, seeing what the present world dynamics present, the opportunity to reflect, transform and create spaces and new opportunities in the social reality of each human being.

According to Michael Fullan (2002), the concept of change in education dates back to the 1950's and 60's, when great thinkers such as Dewey, Durkheim, and Weber, who focus on social and educational development, emerge. Then in the 1970's, reflections began to be carried out in response to the crisis of the educational system, "due to the failure of the great curricular reforms of the 60's and of the innovation initiatives that emerged from outside the school and by specialists from other disciplines" (Murillo & Krichesky, 2014, p. 71).This is how education and innovation have been permeated in both ways, by seeking within the school practices and transformations that generate more value. For Carbonell (2002), educational innovation is understood as "a set of ideas, processes and strategies, more or less systematized, through which there is question of introducing and causing changes in current educational practices" (p. 11).

If we analyse the practices of pedagogues such as Rousseau, Pestalozzi, or Montessori, among others, they could be classified as innovative since they produced transformations, adjustments, and new ways of approaching the teaching-learning processes. Thus, schools are the ideal places to generate practices that give rise to significant learning that is applicable to daily life, because this is what society needs, and which is characterized by the accelerated changes that invite rapid adaptations. As Michael Fullan (2001) puts it:

> Schools are beginning to discover that new ideas, knowledge creation and sharing are essential for the school to learn from how the best companies innovate and deliver results. At the most basic level, companies and schools are similar in that, in the knowledge society, both must become learning organizations, or they will not be able to survive. Therefore, leaders in business and education face similar changes: how to cultivate and maintain learning in conditions of complex and rapid change (p. 11)

From this point, educational innovation generates a change not only in schools, but also in teachers, because they are the ones who must create spaces for mobilization; they become companions of the students 'process; innovative educational practices that will develop the skills needed for this 21s century, as Fullan (2002) expresses it:

> We can predict innovations that address the development of thinking skills for creativity, problem solving, critical reasoning, the use of technology, and collaboration. These skills have so far received only superficial treatments in various references to so-called "twenty-first century skills." The difference in the future will be that work in these areas will be better defined. There will be more innovation, more specificity and precision, by identifying

> instructional practices, and their relationship to student learning outcomes will be shown (p. 105).

Educational innovation, and within it, the methodologies practiced in schools bring with them alterations, changes, ruptures, new relations, and practices deep-rooted in the educational act. Based on this theoretical perspective, which is mediated by technological changes, and committed to the generation of a better world, schools are the settings where these human beings build the skills that will allow them to impact their contexts through empathy, criticisms, and assertiveness.

**RELATED RESEARCH**

In this section, a deep reading was made with its respective reflection of several doctoral thesis written between 2014 and 2019 and indexed journal articles that were found during the construction of the state of the art about educational innovation, its trends and the possible transformations that could be generated in early childhood, K-12, and undergraduate education. With this information tracking it has been possible to delve into the most relevant topics of this research, finding the possible trends that contribute to the theoretical, conceptual, and analytical foundation that have fed the line of the object of study.

**Purpose of the Study**

The purpose of the study was to align school practices with educational innovation as a horizon of transformation and an engine of evolution of the human being, which seeks to educate students with the human skills and cognitive abilities necessary to respond to the challenges posed by the 21st century.

## 2. Methods and Materials

This article arises from the research process proposed from the experience in the rectory of a private educational institution and the undergoing reflections on educational innovation in the research group in Urban Communication -GICU.

**Research Model**

A qualitative research methodology was used according to what Creswell (2007) indicates as the beginning of such a research project: "it begins with assumptions, a worldview, the possible use of a theoretical lens and the study of research problems investigating the meaning that individuals or groups attribute to a social or human problem" (p. 37).

The methodological design had a Reconstructive Critical Hermeneutic approach, which allowed the researcher to understand the phenomenon as something under permanent construction, reflection, and with interpretations built from a critical point of view, since it is from this perspective that Habermas (quoted in Arteta, 2015) "situates in the front line, the cognoscente subject, the interpreter of the text (in fact, for his critical reflection); someone who happens to be not only the translator of the text, but also its transformer. An active, and transformative role that allowed the researcher to comprehend and analyse the object to be investigated.

The research approach was based on educational ethnography since under this model one can understand the school dynamics, explore the perspectives and cultures in which teachers and students intervene. Its value lies in that it pays special attention to the research carried out by teachers in their

daily lives. Within the educational ethnography model. In addition, it took the form of a narrative biographical research because one of the researchers became a research subject who not only collected information, but also became part of the school's own experiences and was able to read and interpret the facts and everyday actions in the light of the experiences and practices narrated by their actors and that she experienced herself, which became an input for this project.

**Participants**

The 28 people who participated in this study are part of the educational community where the study was conducted. For the group of students, it was thought to have representation of all school years from 6th to 11th grades, in ages ranging from 13 to 17 years. The group of 4 teaching directors was made up of people who wanted to participate voluntarily in the study. For the 5 teachers, people were chosen who taught at different ages, and different subjects. The 5 parents selected are characterized by being very active people within the school dynamics, critical to the education processes of their daughters. The 4 representatives of the boards of directors were selected based on their interest in the processes lived in the school. Finally, the 3 experts in innovation were selected with the intention of adding value to the research; these were: the Secretary of Education of the state of Antioquia (Colombia); the Director of the CTA (Center of Science and Technology of Antioquia), and the head of Education of Comfama, an organization that helps develop social and economic communities in Colombia.

**Data Collection Tools**

For the management of data from the study, the technique of information analysis used was the reduction of data, the presentation, and the stage of conclusions (Huberman & Miles, 2000), allowing to develop a systematic work in the practice of collection, analysis and synthesis of the information obtained. Below are the tools used to obtain the information for this study:

***Semi – Structured Interview***

These interviews had the objective that one of the researchers knew first-hand the thoughts about the study of her interviewees, in this case the process of educational innovation that the school was living. These spaces were carried out based on open questions; direct dialogues were established, being able to generate environments of trust so that the story flowed as tranquil as possible. This tool had a script of themes to highlight the most relevant ones for the study; in this way, the researcher was able to channel the topics of the study; as proposed by Flick (2007 cited by Bravo, García, Hernández and Ruiz 2013), semi-structured interviews are:

> Those that offer an acceptable degree of flexibility, while maintaining sufficient uniformity to achieve interpretations consistent with the purposes of the study. This type of interview is the one that has aroused the most interest since "... it is associated with the expectation that the interviewed subjects are more likely to express their views... relatively openly, than in a standardized interview or questionnaire" (p. 163).

***Focus Or Discussion Groups***

This technique defined as "group interviews, where a moderator guides a collective interview during which a small group of people discuss the characteristics and dimensions of the topic proposed for discussion" (Mella, 2000, p. 3), raised the possibility of observing the discourses, the mode of relationship, the new approaches and the construction of referents, in order to understand the language and different points of view and perspectives of the participants of each group. Two focus groups were

held with the participation of all levels linked to the research; the students had a separate group where conversations were directed towards their teacher-student relationships.

***Logical Techno Surveillance***

Also, a logical techno surveillance was made on existing documents in Dialnet, Science Direct and Scopus between 2016 and 2020 (5 years), from the categories: Innovation, Education, Individual Skills, Humankind, Soft skills. The search was done in English and Spanish. A number of 1522 science direct results and 870 articles from academic and scientific journals in Scopus were reviewed, as well as 276 recorded on Dialnet. Refined by journals that had a direct relationship with education, innovation, or educational technologies,138 results were found at Science Direct, 236 in Scopus and 196 at Dialnet. The last filter applied was the categorial reading of abstracts. As shown here: 5 from Science Direct, 3 from Scopus and 9 from Dialnet. They were classified by categories, as shown in table 1 located in the appendix.

**Data Collection Process**

From this exercise, an analysis process of a more specific corpus was carried out, chosen from the lexicometry term frequency criteria related to subject evolution, subject-centric educational innovation, transformative subject, soft capabilities, and humanity/humanism (when these terms are not applied directly or since related words N/A is used, it does not apply). The following section presents the discussion of the results found from the triangulation of the theoretical framework, the review of the literature and the data collected from the participants in the study.

**Data Analysis**

After the interviews and focus groups had finished, and to organize all the information, the transcripts of the recordings were made. For this process the tool offered by Word was used. All the information collected was emptied into an Excel chart, and the answers were classified according to the questions asked and the codes found, as Gibbs (2012) defines it "the codes provide a focus to think about the text and its interpretation" (p. 66). In this way, the exercise carried out allowed the observation of the results since they were grouped into categories.

At a later stage of elaboration and verification of the conclusions (Miles & Huberman, 2000), the researcher used the *Tableau tool,* a software for the design and analysis of the interpretation of data. In addition, the researcher performed a manual interpretation that allowed her greater flexibility and creativity when finding codes and response patterns.

## 3. Results

Technology, science, and telecommunications are three of the main transformations in humanity, therefore education has been immersed in these social changes thanks to the advances that are currently being experienced. Nowadays, pedagogical practice seeks to adjust to the demands presented by this century: teachers, students, the methodologies used to facilitate learning mediated by educational platforms, the different relationships teacher - students, the variety of ways of accessing information, and knowledge management are some of the examples that are influenced by this dynamic. These advances are here to stay, and have become a turning point in education, which finds in educational innovation the path that allows it to reflect and make progress as stated by García-Peñalvo (2015) "it is the process that allows changes in learning / training that produce improvements in learning outcomes" (p. 2).

By the same token, innovations that have emerged in other fields or disciplines have a direct impact on education; an example of these has been the pandemic and the adjustments to remove education from the school buildings to each of the students' homes. Covid-19 brought opportunities for reinvention and changes, where global education was one of its adherents.One lesson from this pandemic, where innovative processes were born, is that it must be flexible, and open to change and new experiences; classroom walls vanished, face-to-face classes are being replaced with virtual ones the internet opens the borders for everyone, with the aim of expanding horizons of knowledge, and relationships. Thanks to the possibilities of interconnection, information was democratized, and a larger percentage of the population has now access to information which years before was completely restricted for a minority, as summarized by the sociologist Manuel Castells (2006):

> The communication system of the industrial society focused on the mass media, characterized by the mass distribution of a one-way message from one to many. The basis of society network communication is the global web of horizontal communication networks that include the multimodal exchange of interactive messages from many to many, both synchronous and asynchronous (p. 20).

Teachers are now called to lead this transformation which is based on educational innovation, by reading the social context and the needs of their students to have contextualized learning processes that respond to the world challenges. González (2014) warns that "education needs teachers with an entrepreneurial and innovative attitude, capable of generating new talents, leaders who motivate others to act" (p. 68).

In this formative process, students cannot be left behind, they acquire more relevance for their active role in the construction of the skills needed to comprehend the world; they have in educational innovation the tool to generate deep transformations creating something new or making better use of what exists. At this point innovation is presented as that bridge that brings these processes together as evidenced in the term developed by Jaume Carbonell in his book *Pedagogies of the 21st century,* “innovative, school and non-institutional pedagogies", where you can clearly observe this aspect, by developing an idea where it breaks with the tradition of teaching - learning that occurs exclusively in school and expands beyond it: "educating the way things are seen, multiple intelligences and the various communicative languages to discover, unravel, perceive and feel what happens in the city in an explicit and hidden way" (2002, p. 32).

## 4. Discussion

Educational innovation is here to stay, the school duty now is to form students with skills such as being creative, autonomous, and reflective, which respond to the current world. This type of skills is also known as soft skills or 21st Century Skills that Ginevra Musicco (2018) classifies them as follows:

> • Introspective: learning to manage emotions, changing limiting creating, identifying strengths and points of improvement, increasing self-awareness and a sense of self-efficacy.
>
> • Diagnostics and action: approach and problem solving, creativity, ability to deal with new situations, flexibility, initiative, planning, time management, etc.
>
> • Relational: empathy, active listening, assertiveness, effective communication, conflict management, negotiation and consensus, management and teamwork and leadership (p. 118).

For Martha Nussbaum (2010), these skills will generate a more inclusive education and better citizens, because they allow students to "develop critical thinking; the ability to transcend national loyalties and address international problems as citizens of the world; and finally, the ability to imagine with compassion the difficulties of others"(p. 26). The same author identifies that these skills promote the opportunity "of life, freedom and the pursuit of happiness"(p. 48), having in the school,

> the ability to reflect on the political issues affecting the nation, analyse them, examine them, argue them, and discuss them without deference to authority or tradition. The ability to recognize other citizens as people with the same rights as one, even if they are of different race, religion, gender, or sexual orientation. The ability to take an interest in the lives of others. The ability to imagine variety of complex issues that affect humans in their development and to reflect on childhood, adolescence, family relationships, disease, death, and many other topics, based on the knowledge of a whole range of stories conceived as more than just a conjunction or data. The ability to make a critical judgment. The ability to think of the common good of the nation. (Nussbaum, 2010, p. 49).

To develop in students the skills of the 21st century, innovation finds its niche as it is the energizer of disruptive processes in the classroom that also permeate the school; it is here that the student sees the acquisition of privileged life skills. In the same way, the new technologies that have also begun to migrate to the classroom and have become another piece of the institutional dynamic, enable the interaction of students with new ways of approaching the world. Through educational innovation teachers learn to see their classroom as a laboratory to investigate, where they can carry out pedagogical challenges, changes in their teaching, new proposals and observe the impact of different strategies in the training process of their students, where learning is contextualized and used in real life projects that have an impact in the world around them. Educational innovation makes it possible to apply knowledge in real contexts and put it at the service to all; it also becomes a mobilizer of the school because teachers energize their strategies to generate meaningful activities, so that students are motivated and challenged. In this way, pedagogical practices focus on students and not on what is taught, demonstrating a paradigm shift from the teacher as the one who has the knowledge and the student receives it, a passive actor in their process. Now, it is the student who has the need to learn to be able to function with all the necessary skills that a globalized world requires.

## 5. Conclusions

After this investigative process has been carried out, the following conclusions may be presented:

The practices in the school, which in its historical moment have been studied, analysed, and reflected by the now "classics" in pedagogy, psychology, or philosophy such as Piaget, Dewey, Montessori, Perkins, Lipman, among others, have generated changes or breakdowns in the educational work by proposing new methods, dynamics, methodologies, or approaches with students and with knowledge.

At present pedagogical practices are permeated by a social dynamic that is characterized by speed in technological change, connectivity and speed of information must also be seen in the light of educational innovation. The need to rethink the teacher, the curriculum, the context, the culture, and everything that permeates the social human being becomes evident in order to understand the type of training that the current students need to be immersed in realities that were unthinkable a few decades ago. For this reason, the school not only has the role to ensure its students acquire knowledge, but also

to stimulate spaces where soft skills develop, that allow interactions with others, which involves designing spaces of creativity, listening, problem solving, research and innovation.

Educational innovation is interrelated with the development of 21st century skills in this actual reality framed by change. It's hard to think about one without the other. These skills are the basis for meaningful learning, contrary to the memoristic and mechanical learning; skills such as problem solving, teamwork, creativity, critical thinking, communication, collaboration, self-regulation, develop as students face situations and seek solutions to them. It is the work of education to keep up with current trends and focus on global dynamics, so that students acquire and strengthen the skills required to operate autonomously in a globalized world. Classroom activities should aim at making students independent, strengthening their emotional and social intelligences, and communicating in the best possible way. This is how school should be, an enabling environment for creating and developing 21st century skills.

The concept of innovation, which is adopted in the educational context, having clarity that its genesis, is in other areas of knowledge as discussed above, presents an opportunity for the school to reflect on its educational work, creating the capacity to generate transformations within. The objective of innovation is to respond to a need, adjust or change a process to add value; aspects that are also addressed in education, by generating dynamism from the educational point of view and aligning with the change that society constantly faces, allowing the gap between education and society to be bridged. Processes of educational innovation turn teachers into mentors and learning guides who accompany their students in a 21st century education, being the latter, the real protagonists, and participants in their continuing formative process. Through educational innovation teachers learn to see their classroom as a laboratory to create, where they can carry out pedagogical challenges, adjustments in their didactics with new methodological proposals, which enables them to be in continuous observation of the process of training their students, where learning is contextualized, which allows to build life or city projects with solutions to situations of daily life, through what has been learned.

Educational innovation allows knowledge to be applied in real contexts and to be shared with society. It is also a school mobilizer, an engine of transformation, of evolution, as teachers energize their strategies to generate meaningful activities, so that students are motivated and engaged. In this way, pedagogical practices focus on students and not what is taught, or who teaches, demonstrating a paradigm shift where the teacher has the knowledge and the student receives it, thus becoming a passive actor of his knowledge. Now, it is the student who has the need to learn to be able to work with all the necessary skills that a globalized world brings, knowing his environment, the situations that surround him and the impact of his life decisions, and is vital to his development; then a transformed and transformative social subject of its reality occurs, committed to himself, but also to others. This is how 21st century learning processes are impacted by educational innovation by using methodologies that favor knowledge building and skills development for life, generating a different dynamic with knowledge constantly adjusting from the relational aspect. Likewise, this brings with it trial and error as a process of learning and daily practice. From this point of view, reflection, analysis, and knowledge building are done in a different way from the transmissionism model that has characterized pedagogical practices, it is closer to 21st century education, where the student becomes the center of his learning and protagonist of it.

Similarly, new technologies that have also begun to migrate to the classroom, such as ICT, have become yet another piece of institutional dynamics and class didactics that, enable students to interact

with new ways to get closer to the world's complexities. From this point of view, teachers become solvers of pedagogical challenges, positioning in pedagogical practice transformative aspects that allow education to be tuned to current global trends. The key to education is dialogue and reflection on what to do, how to do it and what it is done for, so that innovation processes can be carried out in the classroom that add value to pedagogical practice.

## 6. Recommendations

From the educational innovation perspective, the school must develop spaces that invite to the transformation of pedagogical practice from early childhood, K-12, and undergraduate education, in the areas of the curriculum and classroom didactics, where the learning process passes from senseless memory and transmissionism, to generate processes of construction of significant learning that can be taken up to solve the different challenges that arise throughout life. Conceptual constructions that allow them to understand their present and their future, and also their history and their participation in the future of humanity. The education that the twenty-first century needs, better yet, the students of the twenty-first century, these boys and girls called to build their world and project the future of humanity, must be based on the relationship between their selves and their knowledge, also with its ethics and its capacity for discernment. We are in a historical moment in which there is no point in having technical competences with purely academic and conceptual curricula if there is not a solid foundation of personal competencies that go beyond the data, the number, the formula, the positivist thought, which makes it possible to infer, understand, build, interpret, be creative and critical.

Educational innovation is then positioned as an agent of change and engine of evolution, which suggests that human beings have the conceptual freedom to read, interpret and intervene, to be at the service of humanity. This concept frames the need to train a person who makes decisions, understands the world and, of course, transforms it.

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APPENDIX

**Table 1.**

| *Categories: Innovation, Education, Individual Skills, Humankind, Soft skills* **Source** | **Title** | **Educational Innovation (key concept)** | **Soft skills** | **Transformer subjects (features)** | **Humanism / Humanity (Key concepts)** |
|---|---|---|---|---|---|
| Scopus | Citizenship Education for living successfully in 2050 and beyond | From a scenario work process, 15 modal dimensions of reality are proposed that can be adopted to understand citizen education into the future. It states that innovation is central to | To become aware of the changing conditions of our world, to be aware of how to benefit the human, humanity, to generate leadership capacities for good - to live one's own and | Importance of education is designed prospectively, not only for when students leave their educational institutions, but when they must face public life, the direct future, with a realistic | When working for 15 possible scenarios, the following dimensions are mentioned among others: the quantitative aspect (of myographic), physical aspect, bioethical aspect, |

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| | | adjusting to the accelerated changes that our societies present through technological innovations. | social, to distinguish the right from the wrong, to know how to lead life from terms such as good, frugal and the significant. | look at uncertainty, but from an ethical sense with respect to roles. Know how to face challenges with creativity and the ability to think for themselves from a value system. | emotional aspect, analytical-logical aspect, semiotic aspect, historical-cultural aspect, social aspect, economic aspect, aesthetic aspect, legal aspect, ethical-moral aspect, theological aspect or after pendent. |
| Scopus | Education in the times of demographic change and globalization. | The educational issue is contextualized at a time when demographers propose qualitative and quantitative changes in structure in four phases: phase I, of low population increase; Phase II, a population increase due to increased quality of life, even though the birth rate is low; Phase III, moderate growth due to declining birth and stability in mortality rates; phase IV, of demographic stagnation. Phase V would be of social decline because of the low birth rate but the natural death of the eldest population. | There are 5 scenarios:<br><br>1."Working forever", where social and technological change involves the development of existing (and new) activities in relation to medicine, education, technology, food production. But where professional life will get longer and longer.<br><br>2. "Useful Classes", which seek to increase what the market requires in Artificial Intelligence, technologies, natural and computational language systems, without subordinating | Preparation for demographic changes in a more comprehensive vision of education, which prepares social groups to address:<br><br>-Economic shocks,<br><br>-Aging and demographic change<br><br>-Social exclusion<br><br>-Answering attitudes towards the legal and social order.<br><br>Education should be thought not only as a transmission of knowledge, but as the creation of a social capital that knows how to act in a globalization that although it | Educate for life and think of an ecological education (beyond the environmental, all kinds of ecosystems) and from the co-responsibility of the individual in their social relationships.<br><br>Education specialized in new needs and new generational logics.<br><br>Education is the main value for modern times and those who come in is necessary to dignify social functioning in the possible social situations enunciated. |

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| | | | human work to the machine.<br><br>3. "Person per hour", a scenario dominated by independent work, by projects, for limited periods. This can increase labour inequality and individualism.<br><br>4. "There is no work on a dead planet", a scenario where climate change decides the alternatives of the future.<br><br>5. "Through the glass door", transparency and truth are decisive and possible social development focuses on trust and adaptability. | can increase opportunities for association and interaction with others, also carries cultural, societal, political, economic, and demographic risks.<br><br>It seeks to increase the capacity for adaptation and develop a vocational education system at different levels and times of life. | |
| Scopus | Student's perception of Web 2.0 tools and Educational Applications | How to think the web 2.0 for an education that will account for current and future teacher training processes?<br><br>Part of Tim O'Reilly's vision of the need for an education where personalization, networked and collaborative work, as well as | While it is a fairly timely case study, it proposes that the reasons that most motivate the use of the web 2.0 in students is framed in soft processes:<br><br>-Interactive education,<br><br>-Attention | Subjects who can adapt to the education that integrates ICTs and overcome disadvantages of their use in terms of:<br><br>-passivity,<br><br>-Technological addiction | N/A |

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| | | socialization increase student-centred learning:<br><br>- From interaction speeches<br><br>-From social feedback<br><br>-From the relationship between social networks and people. | -Cooperative learning,<br><br>-Active students,<br><br>-Increased creativity,<br><br>-better time management and resources<br><br>-computers help people. | -Degrowth of motor skills<br><br>-Self-sufficiency (not needing the other teacher) | |
| Science Direct | Chatbots for learning: A review of educational chatbots for Facebook Messenger | Application of technological tools such as chatbots in teaching processes - learning to make the use of artificial intelligence | Autonomous learning, affectivity, humanity | how to consider subjects who develop supports and create new tools to integrate educational chatbots and promote other autonomous learning actions in students. | Ability to hold discussions, respond socially to participants' characteristics |
| Science Direct | Examining influences of science teachers' practice and beliefs about technology-based assessment on students' performance: A hierarchical linear modelling approach | Professional development of teachers, new evaluative methodologies, education mediated in technology. | Teachers' positive beliefs in the face of technology-mediated assessment impact students' good practical outcomes in the face of skills such as autonomy, commitment, interaction | Ability to self-assess, to work collaboratively, political, and practical implications for technology. | N/A |
| Science Direct | Do MOOCs contribute to student equity and social inclusion? A | MOOC as an open education tool and extension of educational participation. | Importance of the democratization of knowledge and the social inclusion of vulnerable communities and populations | You'll be interested in social justice, for fairness.<br><br>Interculturality (from bilingualism | Inclusion, more ethical vision of education versus diversity. Accessibility of education to different vulnerable |

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| | Systematic Review 2014-18 | Opportunity for open education for vulnerable populations (social inclusion). A critical review is made against the use of MOOCs for the democratization of knowledge. | through open education. | and multilingual capacity building to principles of collaboration between different training levels and social levels). | audiences (ethnicity, learning difficulties, migrants). It requires interdisciplinarity and collaborative on the part of the participants, which helps to solve new needs. |
| Science Direct | Pathways to Educational change revisited-controversies and advances in the German Teacher education system | Educational innovation as a transdisciplinary exercise, collaborative learning, and new transfer with views from a systemic change in teacher education and school practices. | It raises the need for a process of transdisciplinary cooperation involving social problems, discourses of social actors, innovation of social practices, learning and integration of knowledge between academics and social actors, reintegration, and application of knowledge. | Work in transdisciplinary development teams for teacher training. Union culture in partnership with four teaching education challenges: competency-oriented training, inclusive schooling, mentoring in practical studies and teacher health. | Seek transdisciplinary in research processes that facilitates the co-constructive interrelationships of different fields of interest.<br><br>Work communities and practical research associations in the school field. |
| Science Direct | What influences teachers' "buy-in" of research? Teachers' beliefs about the applicability of educational research to their practice. | Importance of educational research and conceptions in the face of teaching knowledge: there is an affective dimension that motivates or does not motivate the recognition and application of knowledge of educational research in teaching practice | Investigative culture. Importance of being recognized by peers.<br><br>Positive attitude towards risk. tolerance.<br><br>Importance of transparency.<br><br>Collaborative discussions between teachers | Leadership in educational research processes that facilitate the transit towards system change in the face of investigative culture. | N/A |

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| | | and, of course, the possibility of educational innovation in the classroom. Importance of making media uses of educational research among teachers. | and researchers facilitate educational research processes at school.<br><br>Importance of knowledge corridors in the dissemination of educational changes (specialized in knowledge of research design, methodology, as well as scientific journalism). | | |
| Dialnet | New technologies as innovative teaching-learning strategies in the digital age | Educational innovation understood as a pedagogical change from a communicative act that allows to emphasize teaching adequacy, suitability, and impact of ICT in the classroom, in a comprehensive process of teaching - learning. | Positive personal perception in the face of innovation and new experiences, flexibility; future-focused teaching. Updating the improvement of tools autonomously (various modes of autonomy) | Reconsider the teacher-student relationship, where closer and more personal relationships with the student help create a climate of trust that promotes autonomy. | ICTs have changed the type of interaction and philosophy of teaching work, but this must result in a disciplinary, pedagogical, and technological reflection to promote a critical, emancipatory, equal, and fair use of ICTs, i.e., more authority and not less, if not disciplinary, but demonstrative. |
| Dialnet | Serious games to enhance the acquisition of digital competencies in teacher training | "Serious games facilitate changes in attitude and behaviour.<br><br>enable pedagogical innovation, enhance | Use of the game according to characteristics (advergames, edutainment, simulation, serious play), strategies of ludification, | The acquisition of competences from the games, must involve pedagogical, social, ethical, management and professional | N/A |

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| | | interaction with others, promote research, facilitate the acquisition of<br><br>technological skills and skills, incentivize respect and social, ethical and legal awareness of the use of ICTs" (p.1) | importance of pedagogical intent. | development dimensions | |
| Dialnet | A dialogical self-approach to understanding teacher identity in times of educational innovations | The text states that it can only be achieved<br><br>profound change in education if the professional identity of teachers who<br><br>participate in innovation and to do so propose to work on self-reflection. | It involves developing skills from bending to practice, self-regulation, positioned learning, metacognitive processes, commitment to collaborative work and research | It involves renaming experiences (producing meaning in the teaching-learning process) and reconstruing practices. | Integrative vision of the different human dimensions (the subjective, the professional, the practical, the reaction to change) |
| Dialnet | Educational change in the face of technological innovation, skills pedagogy, and emotional education discourse: A critical look | It is analysed from three planes or trends: market interest (educational innovation linked to ICT and business opportunities); the pedagogical approach by skills and its pragmatic vision of education; and the theory of multiple intelligences (which raises competencies from another | Criticism of educational innovation is made focused on technological innovation. Likewise, it presents a critical reading about the discourses of competition (where the evaluation sets aside diversity and difference and refocuses on the culture of teaching and not on learning), as well as the | While the emotional and affective experiences of subjects are involved in their personal and social development and contribute to the construction of reality and education, it is also important to recognize that it is important to initiate knowledge with effort, with socialization in the culture to be | Set aside emopedagogy, competency/competitive education and focus on a recognition of itself and the culture to which it belongs. |

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| | | view focused on positive psychology and happiness). Pedagogical commitment is defeating a permanent effort to bring the subject into contact with culture, knowledge, desire, and openness to a common world. | principles of neuroeducation and emotional education (falls into a pedagogy of identities that nullifies subjectivity and intellectual effort, predominance of the psychological over other dimensions of being). There is talk of restoring pedagogical commitment:<br><br>-Go beyond training for work<br><br>-Reconnecting it to cultural thought projects<br><br>-Back to growing and learning: living the pleasure of learning, but also the enjoyment (which is sometimes pain) of learning for themselves | understood in the broad sense, to provide them with languages to communicate, to understand everyday events, concepts, models, put them in contact with society and with culture.<br><br>The teacher must mediate the desire to know about each other and not subordinate learnings to emotions. They highlight Mireau's phrase (2016): sustaining "the promise that intellectual effort allows access to the joy of thinking". | |
| Dialnet | Active methodologies:<br><br>The necessary updating of the education system and teaching practice | It is proposed to return to the constructivist conception as the motivation for student development from its subjective and diverse capacities and potentials,<br><br>build meaningful learning, learn to | -Respect the interests of the subject<br><br>-Part of the previous knowledge.<br><br>-It is connected to reality.<br><br>-The student has an active role, is | - Enriched role of education as a pedagogical guide.<br><br>- Possibility of reinvention of teachers and teaching according to contexts and groups | Importance of promoting cooperative work, civic and prosocial aspects, conflict resolution from dialogue, commitment to culture, society, and the life project itself. Ethical and aesthetic assessment of the |

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| | learn, modify knowledge schemes from the cognitive circuit (balance-imbalance)<br><br>and enable an active role of the student. | not a mere recipient of information.<br><br>-Requires the exercise of higher-order cognitive functions (executive functions).<br><br>-It implies a modification of the role of the teacher.<br><br>-Requires prior training.<br><br>-Generally, part of cooperative work, although it is also<br><br>contemplates individual tasks.<br><br>-Promotes innovation, creativity, meaningful learning, and construction<br><br>personal and knowledge criticism.<br><br>-Prepares the student for real challenges, as he develops the same<br><br>skills to be demanded in the world. | -Creative, thoughtful, analytical, and critical skills.<br><br>-Personalization of learning processes<br><br>-Adaption to different learning styles and multiple intelligences. | teaching and learning processes. |

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| | | | -Promotes the development of prosocial, communicative, and empathetic skills.<br><br>-Allows teachers to create their own methodology, adjusted to their reality. | | |
| Dialnet | Collaborate to innovate contributions from a Portuguese case to redesign the notion of educational innovation | Educational innovation as a need for a comprehensive approach to promoting learning within and outside the school system, with new strategies and new commitments (new pedagogies, didactics, and teaching practices) and from best organizational practices.<br><br>Understand educational innovation as a process. | Creativity, playful strategies, design thinking, game management.<br><br>-Work between diverse educational institutions in mutual collaboration.<br><br>-Research centres and schools in dialogue<br><br>- Better student guidance systems<br><br>-Inclusion and participation of different educational actors (parents, tutors, teachers) | -People with attitude and aptitude for inclusion, solidarity,<br><br>-with a collaborative, thoughtful approach, oriented to personal and social growth<br><br>-Research and learning capacity from practice and experience.<br><br>-Creativity in knowledge-sharing mechanisms | Humanization of training processes as the different dimensions of individual and collective learning, subjectivities, identities, traditional and innovative practices are considered. We seek a mutual, horizontal, dialogical learning, where the various agents, their knowledge and their experiences are valued, where all participants have something to teach and something to learn. |
| Dialnet | Assess critical thinking in Citizenship Education: Proposal for | Educational innovation from approaches closer to the future performance of learning processes. | Critical thinking<br><br>Ability to make decisions in uncertain contexts. | -Collaborative work capacity<br><br>-Capacity for peer criticism - hetero-assessment and | N/A |

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| | Oversized Contexts | Educational convergence and quality of teaching within in critical thinking evaluation processes. | Education for citizenship and understanding and respect for human rights.<br><br>Tolerance, coexistence, dialogue, acceptance, and respect for cultural diversity.<br><br>social integration.<br><br>democracy. | co-evaluation of processes<br><br>-Responsibility for making constructive peer evaluation.<br><br>-To become aware of intellectual, rational, and irrational dualities.<br><br>- Active participation<br><br>-Oral and body expression in collaborative dynamics and social processes<br><br>-Autonomous time management. | |
| Dialnet | Informational competence as a requirement for the training of 21st century teachers:<br><br>Analysis of teaching strategies for its acquisition | Educational innovation as training skills in future teachers: training the teacher is the first step to educational change. | -Management, selection, and production of information<br><br>- Critical capacity against the media.<br><br>- Information for socialization: the production, dissemination and critical consumption of information guarantee the survival and growth of social groups. | Subjects who are eligible to share knowledge<br><br>Subjects with ICT skills and skills for information and knowledge management.<br><br>Active and collaborative learning, formative assessment, and knowledge transfer | N/A |

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| | | | -Information use capabilities in different tools and digital environments<br><br>-Adequate performance in formal contexts.<br><br>-Ability to learn to learn<br><br>-Awareness of new and future scenarios of interaction and education. | | |
| Dialnet | Educational Innovation in the Classroom through Design Thinking and Game Thinking | The term Educational Innovation is used from processes of technological innovation and incursion with processes of new teachings (disruptive strategies for learning) | -Collaborative learning<br><br>-Mediation of ICTs administration, interaction, and moderation of teaching resources<br><br>-Creativity and innovation in practices | -Teachers trained to take advantage of digital tools<br><br>-Teachers who plan strategies for Special and Inclusive Education.<br><br>-Centrality in subject and meaningful learnings.<br><br>-Development of creativity through design thinking<br><br>-Capacity to explore new strategies and resources | N/A |

*Source*: own elaboration, 2021.